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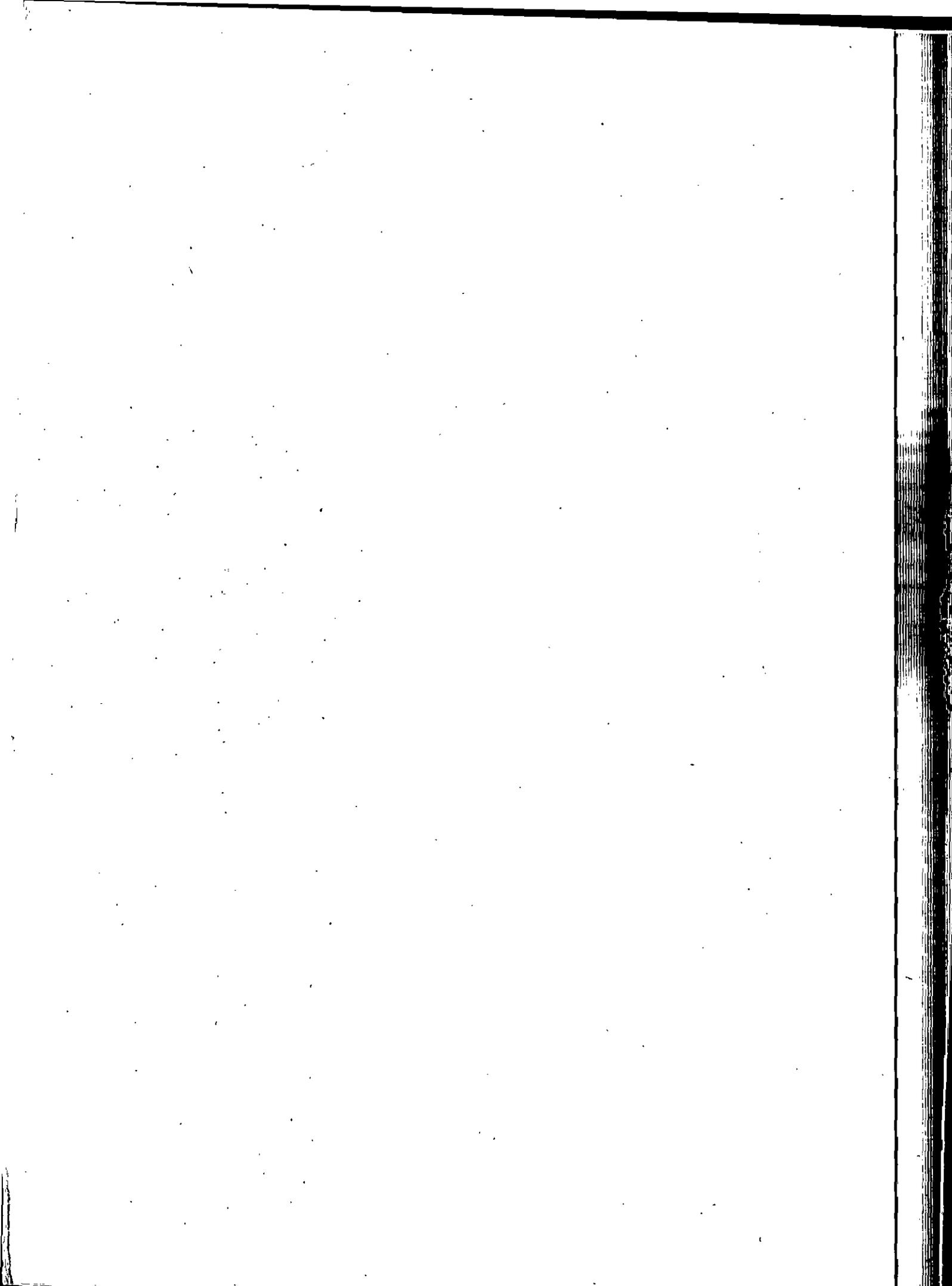
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The Pathways To Higher Studies

Home Science

Class-XII





HOME SCIENCE
CLASS 12

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Notes

1 HOME SCIENCE

Home Science

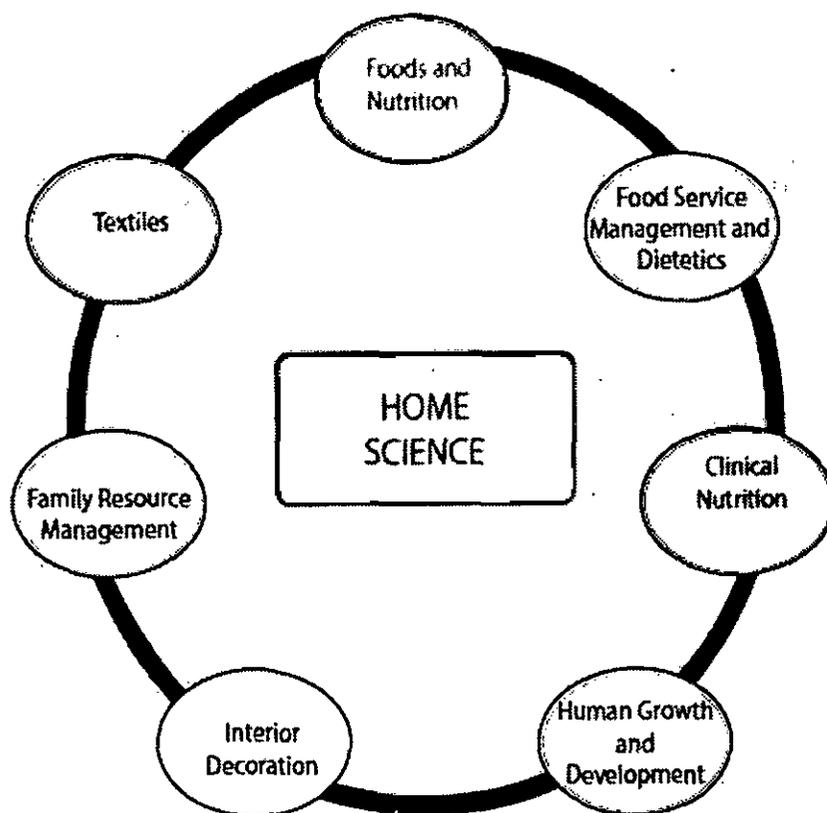
concept, scope, employment Opportunities.

- Understand the concept of home science.
- Discuss the scope of home science.
- Describe the employment opportunities of home science.

Objective of the chapter:

The basic objective of this chapter is to throw some light on the initial concepts of home science so that the fundamentals of home science can be learned.

Introduction



▲ Fig. 1 Home Science- An art and science

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Home Science



Notes

Home Science or the science of managing a home, includes a study of all aspects related to our home. It is a study that focuses on family members and the achievement of satisfaction of each and every member through thoughtful effective and constructive use of resources.

Home Science is both an “art and science”. This is because it teaches the art of using resources so that a harmonious whole is achieved and an overall pleasant effect is created. At the same time, it provides the scientific basis of techniques involved in making a home a happy healthy and beautiful place to live in. For example, the subject Home Science imparts knowledge about the different food groups, the nutrients present in them, the causes of nutrient deficiency and the dietary management of various diseases. This is the ‘science’. However, the ability to prepare various recipes with required nutrients for a particular age group and serve it in a very attractive manner in a pleasant environment so as to motivate consumption of healthy foods and feeling of wellbeing is an ‘art’.

Interdisciplinary Nature of Home Science

Home Science draws a major portion of its content from pure science disciplines such as physics, chemistry, biochemistry, physiology and biology. It also draws its content equally from economics, sociology, anthropology, psychology, community development, communication, media and technology. Hence, it is an interdisciplinary field with much scope as it encompasses the salient features and components of both science and arts courses.

EVOLUTION OF THE DISCIPLINE OF HOME SCIENCE

In India, the study of Home Science can be traced back to the British rule between 1920 and 1940. The rulers in that period introduced Home Science in some schools and colleges. It was initially known as “domestic science” and was first introduced in Maharani Girl’s High School, Baroda. Later the Home Science subject was included in various other states such as Uttar Pradesh, Madhya Pradesh and some southern states and thus the curriculum underwent changes over the years.

Home Science has now been claimed to be an important subject in the school curriculum because it includes all significant areas of art and science which is crucial for the development of the individual, family and society.

Although Home Science paved its ways into many schools all over India it was not offered at the college level for a very long time. Hence, many students were unable to pursue the study of Home Science at an advanced level. Lady Irwin College, Delhi was the first to introduce Home Science as a degree programme at college level in 1932. From 1938 onwards, Chennai University offered Home Science at the degree level. Queen Mary’s College and Women’s Christian College at Chennai started Home Science in 1942. Since 1950, a degree programme in Home Science was included at Coimbatore (Tamil Nadu), Ludhiana (Punjab), Mumbai (Maharashtra), New Delhi, Udaipur (Rajasthan) and Tirupathi (Andhra Pradesh).

Initially there were few students who enrolled for the course. With the regular reconstruction of the curriculum based on the reforms in science, technology and art, there was found to be a steady increase in the number of students who enrolled for a degree in Home Science. At present thousands of post graduates and PhD degree holders are in prominent positions in prestigious institutions all over the country. Home Science has now been claimed to be one of the important subjects in the school curriculum because it offers fundamental opportunities to students to develop their potential for promoting the society and themselves.



Diploma Courses in Home Science

Diploma course in Home science was offered by the Agricultural Institute of Allahabad in 1935. In 1950, Baroda became a significant nucleus and epicentre of Home Science education. In the mid 1960's and 1970's more Agricultural Universities were established through-out the country and a diploma course in Home Science was included in most of the Agricultural Universities.

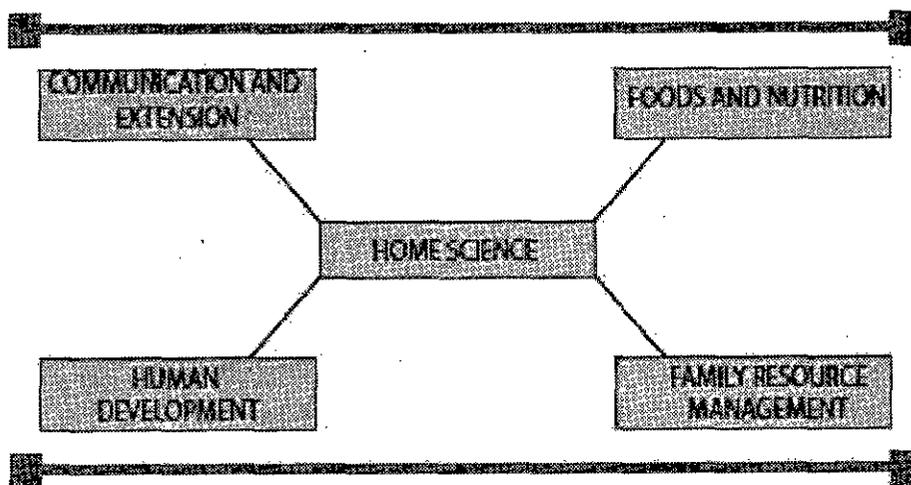
In 1951 the "Home Science Association of India" was formed. The constitution of the Home Science association was framed by Miss Dorothy Pearson of Women's Christian College, Chennai. Later the association became affiliated to the "International Federation of Home Economics".

COMPONENTS OF HOME SCIENCE

There are five major components or areas of specialisation in Home Science.

- Food and Nutrition
- Family Resource Management
- Textile and Clothing
- Human Development
- Communication and Extension

The study of Home Science is so advanced that each specialization is a vast domain in its own ways with its areas of specialization and vocation/professional opportunities. Table-1 emphasises the branches of Home Science along with specific areas dealt in each branch.



▲ Fig. 2 Five Major Components of Home Science

1. Foods and Nutrition

In this course, the chemical composition of food, the nutrients present in them, their bio availability, functions of various nutrients, and loss of nutrients in cooking and processing, techniques in food safety and food security, nutritional deficiencies in the human body and its consequences are dealt with in detail.

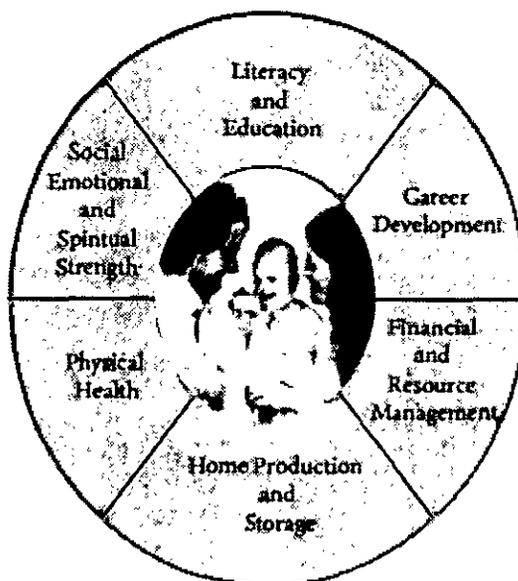


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2. Family Resource Management

The management of resources such as time, money, energy and space are the main topics for study under family and community resource management. The students gain knowledge about home scale budget preparation and work simplification techniques

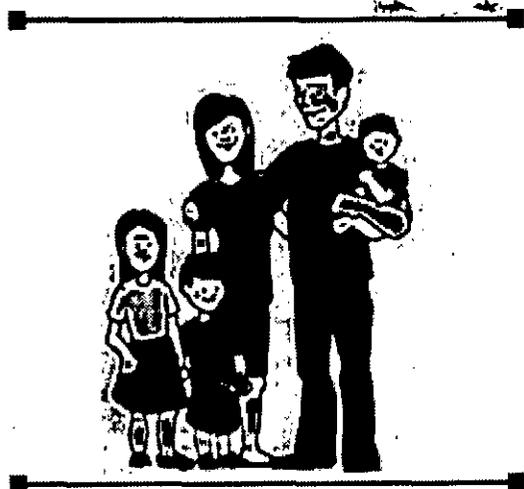


Consumer education is also included under this subject in order to ensure that students become intelligent consumers who are aware of their duties, responsibilities, rights and privileges as consumers in the society. The students are provided information regarding

food safety, safety against adulteration, common adulterants, health hazards and Consumer Protection Act. Major principles and basics of design and arts are also detailed in this area.

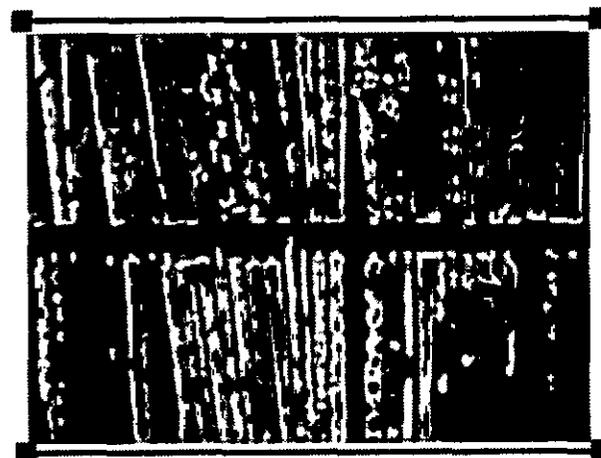
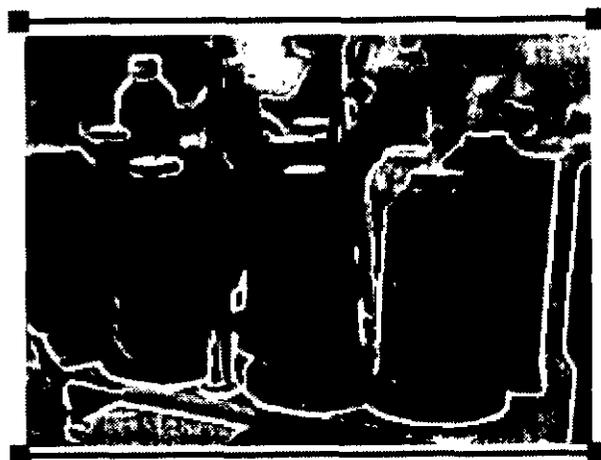


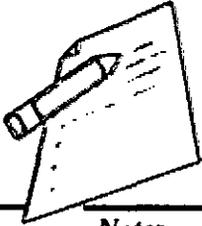
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3. Textile and Clothing

Textile science includes all details about various natural and synthetic fibres. The process involved in construction of fabrics, apparel designing and as well as fabric finishes are also taught.

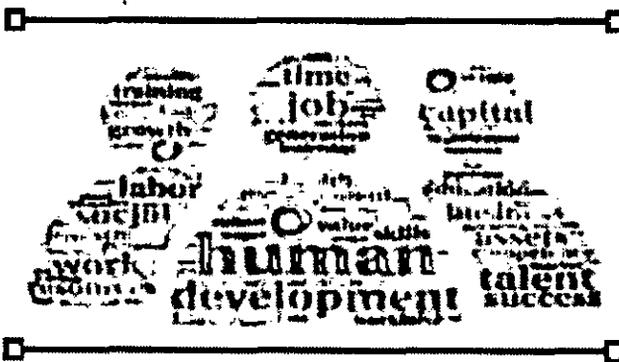




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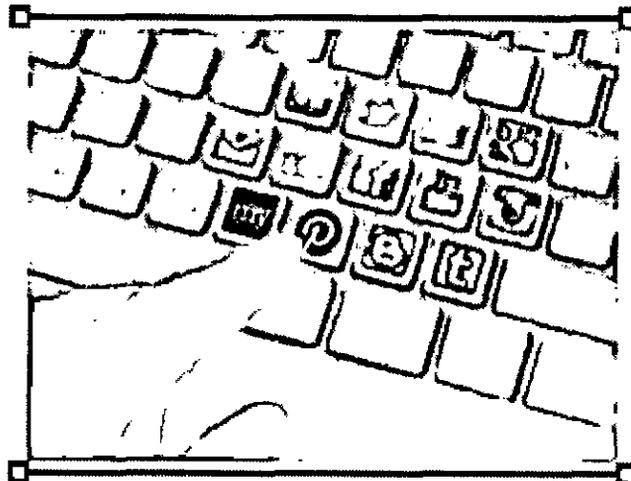
4. Human Development

Human development deals with the development of a child from conception to old age and the developmental task pertaining to each stage in life. Physical, motor, emotional, language, cognitive and social development of human beings is also included in this. Behavioural problems of children, special or differently abled children and specific problems and issues that hinder the development of human beings are also dealt. Geriatrics is also a part of the study.



5. Communication and Extension

Extension education includes the study of programme planning, preparation of audio-visual aids, social work, applied nutrition and methods of communicating with the society.



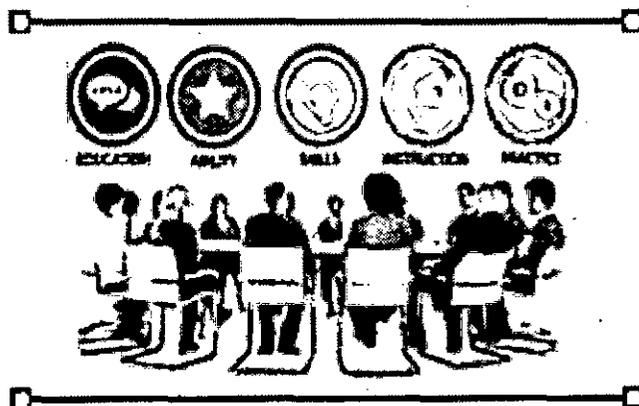


Table 1 Branches of Home Science Along With Specific Areas of Specialisation In Each Branch

Main Branch	Areas of specialisation
Foods and Nutrition	Food Science and Food Safety Clinical Nutrition and Clinical Biochemistry Community Nutrition Therapeutic Nutrition Sports Nutrition Food Preservation
Family Resource Management	Fuel and Energy Management Family Finance Management Housing and Equipment Interior Decoration Consumer Education
Textiles and Clothing	Clothing Construction Concepts of Fibres and Fabrics Textile Designing Apparel Designing Care and Maintenance of Clothes
Human Development	Human Growth and Development Adolescence, Marriage, and Family Guidance Needs and Care of Elderly Needs and Care of Special Children
Communication and Extension	Modes and Significance of Communication Development Programmes- Planning and Evaluation Entrepreneurship- Training and Capacity Building Management of Community Service Organisation

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Notes

Table 2 Home Science Course Offered in Various Colleges and Universities

Courses		
UG courses	B.Sc Nutrition Food Service Management and Dietetics	
	B.Sc Clinical Nutrition and Dietetics	
	B.Sc Nutrition and Dietetics	
	B.Sc Food Science and Nutrition	
	B.Sc Home Science	
	B.Sc Textiles and Fashion Design	
	B.Sc Interior Design & Resource Management	
	B.Sc. Human Development	
	B.Sc. (Hons.) Food, Nutrition and Dietetics	
	M.Sc Food Science and Nutrition	
	M.Sc Foods and Nutrition	
PG courses	M.Sc Food Service Management and Dietetics	
	M.Sc Textile and Fashion Apparel	
	M.Sc Interior Design and Resource Management	
	M.Sc Human Development	
	M.Sc Extension and Communication	
	M.Sc Bio-Textiles	
	M.Sc Apparel and Fashion Design	
	M.Sc Exercise Physiology and Nutrition	
	M.Phil and Ph.D.	Food Science and Nutrition
		Foods and Nutrition
		Food Service Management and Dietetics
Textiles and Fashion Apparel		
Human Development		
Extension and Communication		
Resource Management		
Bio-Textiles		
Exercise Physiology and Nutrition		

RELEVANCE OF HOME SCIENCE IN IMPROVING QUALITY OF LIFE

The study of Home Science improves the quality of life of people through the following ways:

1. Helps people lead a more satisfying personal, family and community life through the dissemination of knowledge and appreciation of cultural and spiritual values.
2. Offers maximum opportunity to express one's ability to understand and manage their resources and develop leadership qualities.
3. Develops qualities needed for responsible citizenship.
4. Helps student to recognise the importance of food in ensuring health.
5. Teaches about food safety that needs to be adapted right from farm to fork,
6. Imparts knowledge about healthy food preparation techniques.
7. Provides practical tips in preparing a balanced diet.
8. Enables one to make good decisions, sort out family problems and find out solutions for them.

9. Provides necessary guidelines about entrepreneurship so as to help young students identify and pursue income generating activities.
10. Gains technical knowledge and information from various branches of Home Science for both personal and professional use.

SCOPE OF HOME SCIENCE

At the College / University level, Home Science is offered as a Bachelor's Degree programme with duration of three years and as a Master's Degree programme with duration of 2 years. Master of Philosophy in Home Science is one year programme. The course offered in some of the reputed colleges and universities in Tamil Nadu are given in Table-2.

The future career prospects for graduates and post graduates in Home Science are as follows:

1. Clinical Dietician

- Hospitals and outpatient clinics,
- Work with chefs in hospitals, corporate sectors, hostel and day care centres.
- Consultants in diet and health

2. Public Health Nutritionists

- Public health departments such as ICDS and Noon Meal Programme,
- Food experts and scientists in institutes such as Central Food Technological Research Institute and National Institute of Nutrition.

3. Academicians and Research Scholars

- Teaching in schools, colleges, universities, health professional colleges and culinary schools
- Manage or assist with clinical proto-cols, interventions or clinical trials.

4. Consultant / Private Practice

- Dietary consultants or Dieticians at hospitals after being certified as Registered Dietitians.
- Client counselling for weight management, eating disorders, sports nutrition, disease management,
- Write cookbooks, educational pro-grams, articles for local newspapers or specialty magazines,

5. Business and Industry

- Careers in business and industry include jobs such as sales, marketing, public relations, research and development (labelling, recipes, product information and production, quality control)
- Food production (food products & preservation),
- Nutraceuticals
- Hotel Industry.
- Fashion designing Establishing day care centres for babies and Pre-school children.



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6. National and International Food Organizations

- Based on the specialisation in various branches of Home Science a student may gain entry into
- Organizations such as World Health Organization, Food and Agriculture Organization,
- Public Policy / Government organizations
- Public service through group service examination

Career Opportunities in Home Science

Home Science is both a science and an art related multi-disciplinary field of study involving biology, chemistry, physics, physiology, hygiene, economics, rural development, child development, sociology and family relations, community living, art, nutrition, textiles and home management. One can specialize in any of the five streams of home science - Food and Nutrition, Resource Management, Human Development, Fabric and Apparel Science and Communication and Extension or have a general understanding of all streams. A career in Home Science is best suited for modern women with keen aesthetic sensibilities in contemporary arts & modern housekeeping among others.

Career Opportunities in Home Science

- Production Industry
- Tourism and service industry
- Healthcare industry
- Dietetics and Nutrition
- Teaching and research
- Self-Employment
- Textile and Clothing
- Resource Management

How to Pursue a Career in Home Science

	Stream	Graduation	After Graduation	After Post Graduation
Path 1	Class XII with science/any stream (Home science as an option)	Pursue B.Sc. in Home Science for 3 years	Pursue M.Sc. Home Science (Specializations in Food and Nutrition, Family Resource Management, Apparel and Textile Science, Extension and Communication Management and Human Development) for 1-2 years	Pursue M.Phil. in Home Science for 2 years or/ and Ph.D. for 3-4 years
Path 2	Class XII with Science/any stream (Home Science as an option)	Pursue B.Sc. Home Science for 3 years	Pursue P.G. Diploma in Home Science for 1-2 years	-

SUMMARY

Home Science or the science of managing a home, includes a study of all aspects related to our home. It is a study that focuses on family members and the achievement of satisfaction of each and every member through thoughtful effective and constructive use of resources. Home Science is both an "art and science". This is because it teaches the art of using resources so that a harmonious whole is achieved and an overall pleasant effect is created. At the same time, it provides the scientific basis of techniques involved in making a home a happy healthy and beautiful place to live in. For example, the subject Home Science imparts knowledge about the different food groups, the nutrients present in them, the causes of nutrient deficiency and the dietary management of various diseases. Home Science is both a science and an art related multi-disciplinary field of study involving biology, chemistry, physics, physiology, hygiene, economics, rural development, child development, sociology and family relations, community living, art, nutrition, textiles and home management. One can specialize in any of the five streams of home science - Food and Nutrition, Resource Management, Human Development, Fabric and Apparel Science and Communication and Extension or have a general understanding of all streams. A career in Home Science is best suited for modern women with keen aesthetic sensibilities in contemporary arts & modern housekeeping among others.

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EXERCISE

Multiple choice Questions

Select the correct alternative from those given below.

- Home Science means _____
 - learning to build interpersonal communication
 - the art of managing your resources
 - developing a skill to start an enterprise
 - all the above
- Which of the following is not a specialization area in Home Science?
 - Food Science
 - Garment Designing
 - Nursing
 - Interior Decoration
- Read Section 1.1 and list any four ways by which Home Science can help you.
 -
 -
 -
 -
 -
- Give any four examples of home-based self-employment opportunities in the area of Home Science.
 -
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5. List any one wage-employment opportunity in the five specialisation areas of Home Science Specialisation Employment Opportunity
 - (i) Food and Nutrition
 - (ii) Resource management and Designing
 - (iii) Clothing and Textiles
 - (iv) Human Development
 - (v) Communication and Extension

ANSWERS :-

- (1) d
- (2) c
- (3) (i) resources efficiently (ii) beautiful, well managed (iii) successful career
- (4) (i) Catering, home based production services (ii) Interior decoration and Furniture Designer (iii) Dress/Textile designing, Owner of a shop or boutique (iv) Social welfare, Day-care or school after care for young children (v) Researcher, Organisation communication consultant
- (5) Wage-employment Self-employment i, iii, v, viii, ix ii, iv, vi, vii, x

Review Questions

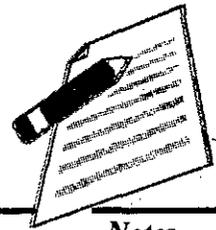
1. Explain home science?
2. Discuss the components of home science?
3. Explain the scope of home science?
4. Explain the employment opportunities of home science?

Activity 1

How will you motivate your friends in junior school to enrol for the subject Home Science in higher education by highlighting the scope of Home Science.

2

FAMILY, HEALTH AND SECURITY



Notes

Family, Health and Security:-definitions, types of family, importance of health, factors contributing to health, methods of providing, safety and security at home

- Understand the concept of family.
- Discuss the types of family.
- Describe the importance of health.
- Discuss the factors contributing to health.
- Describe the methods of providing safety at home.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of family, health and safety so that the fundamentals of family can be learned.

Introduction

The oldest and most common human institution, 'family' is the most important group to which most people ever belong. Each one of us is born into a family – with a father, mother, may be grandparents, uncles, aunts and siblings. Among them we feel protected, wanted and loved. In a family we are cared for and feel emotionally and financially secure. Family teaches us how to interact and get along with others, obey and respect elders. It helps in learning customs and traditions and imbibing values and culture which are passed on from one generation to the next.

Define the term family

Family is universal and typically consists of a married man and woman and their children. Family means a group of related people who share a common home. Members belong to a family through birth, marriage or adoption. Three characteristics of family emerge from here. These are, a couple is married and hence has legitimate status to sexual relationship between husband and wife.

Second, it implies a common place of residence for all its members. Of course, it is seen that sometimes one or more members of a family may temporarily live away from the house for reasons of work or otherwise. Similarly, some members like old and aged parents/ uncles/aunts or even cousin may stay with the family and are considered a part of the family.

Thirdly, a family consists of not just the married couple but also children, both natural and adopted. Natural children are those born to the couple and others may be legally adopted by the couple. Clearly, therefore, the family is the first organized unit of a society.



Notes

Functions of a Family

There are several important functions which a family performs.

- (i) It gives protection: Indeed, it provides the best setting for the rearing and care of new-borns and infants, adolescents, the sick and the infirm or aged.
- (ii) It provides emotional support of a degree and kind that is not available otherwise. Such bonding is indispensable for the healthy development of children. In fact, the family is the primary group which allows intimacy and affection to be freely expressed.
- (iii) It educates its members, who learn to live life in the setting of a family. Children are taught the do's and don'ts of the society, how to interact with others, respect and obey elders, etc.
- (iv) It provides financial security. Basic needs such as of food, shelter, clothing is provided for members and they share responsibilities and work.
- (v) It acts as a source of recreation. A family can be a source of happiness, where members can talk to one another, play and do various activities together. These may range from household work to celebration of festivals and other events like birth, engagement or marriage.
- (vi) Family also performs the function of socializing children. Parents give their children the first lessons in how to live with other people, to love, share, help in time of need and take on responsibilities. The family nurtures attitudes and values in children and influences their habits. Traditional skills are also picked up within the family. The family also prepares its young members to get formal education in school and beyond.
- (vii) Family also fulfils the sexual function which is a biological need of every human being. You know that family implies marriage and all societies approve of sexual relation between man and woman after marriage.
- (viii) Reproductive function is fulfilled as a result of sexual relationship between married man and woman. Children so born are the future members of the society. Look at your own family and see whether all of the functions mentioned above are being fulfilled. Your answer will probably be yes.

Types of family

You may have seen that some families are very small and others that are very large. You are right, of course.

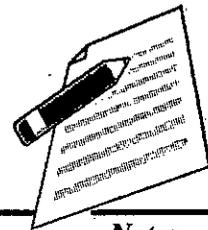
Two types of families are seen in India- – Joint Family – Nuclear Family

A great deal of importance is attached to the family as a unit. In our country, Indian families, generally, are very stable and child-centered. Let us learn about the characteristics of both joint and nuclear families. Joint Family is made of a combination of nuclear families, and consequently it is much larger. It is made up of a man and his wife, their unmarried daughters, married sons, their wives and children. The men are of the same family and women enter the family by marriage.

However, where the woman is the head of the family, it is the mean who enter the family through marriage. It is a group of more than one or even two generations living together.

Characteristics of a joint family therefore, are as follows

- i) All member lives under the same roof.
- ii) Members eat food cooked in a common kitchen.
- iii) Members are co-owners of property of the family. The eldest male member of the joint family looks after the finances and the property i.e., there is a common purse.



- iv) Members participate in common family events, festivals and religious ceremonies.
- v) Daughters of the family get married and move out to their husband's house while sons remain in the house with their wives and children.
- vi) The decision-making power in a joint family is with eldest adult male member. The eldest woman also plays a role in decision making but in a subtle way.

Traditionally, joint families used to be the rule in our society. Things are changing now especially in urban areas. However, the joint family system still continues in agricultural and business families.

There are several advantages of a joint family:

- It encourages family members to be co-operative and accommodating. Work, especially agricultural work, can be shared.
- It allows for the old, the helpless and the unemployed in the family to be looked after and cared for.
- Rearing of small children becomes easier, especially when both parents work.
- A child gets emotional and economic support in the event of the death of a parent.
- There is greater financial security.

Joint families also have their problems.

- Women are sometimes badly and unequally treated.
- Often disputes arise among the members over property or the running of a business.
- Some of the women have to do all the housework, and they get very little time or opportunity to develop their personality.

The Nuclear family is usually a small unit made up of the husband, the wife and their unmarried children. Sometimes a brother or unmarried sister of the husband may be living with them. This would be an extended family.

There are some advantages of living in a nuclear family:

- Members of a nuclear family are generally more independent and show greater initiative and self-reliance.
- The children are frequently encouraged to make decisions. This increases their self-confidence.
- Deeper emotional ties develop among the members. This is on account of the greater privacy and also opportunities for mutual interaction which are available in a nuclear family.
- It is seen that as a society becomes more industrialised and urbanized, the incidence of nuclear families increases.
- One of the foremost reasons for families to be nuclear, especially in big cities is housing problem. Larger families need larger space to live in. If families have to live conveniently there is little option but to stick to a "nuclear" family.

Disadvantages of a Nuclear Family

- There is no adult support to the young couple. No experienced person of the family is readily available for advice.



Notes

- When both the parents are working no one from the family is there to take care of children. In case of adversity there is no one to support the family financially or emotionally.
- Social values like 'adjustment', sharing or cooperation are difficult to learn.

Changing family scenario

As we have said earlier, industrialization has brought about many changes in the type of family and as a result, in the roles and responsibilities of members of a family. So far, in a traditional family, the sons 'took on' the family business or profession. The father or male members used to earn the money and were responsible for the 'outside' work. The women looked after the home and the children.

Now children, boy or girl, are more educated and have greater and better opportunity for jobs. They leave their home to work elsewhere, most often to urban areas from rural areas and suburbs. This has resulted in more nuclear families. Because of smaller families, requirements of the family have changed, for example ration requirements are less and also different because the number of people at home are less. Being on their own, women have a greater responsibility of looking after the home and outside work. Similarly, the men also have to help out at homes looking after the children, etc.

In some cases, women have taken up jobs outside the house and have the added responsibility of earning and looking after the home and children. The children too have to be more self-reliant and have to do their share of work at home. Family life was earlier rigidly patriarchal, where children and wives had few rights and privileges and were not free to voice an opinion. It is now undergoing a change. In the modern home women have greater freedom and social importance. The children too have rights of their own. Their interests and desires have to be considered. They also are able to voice their opinion on family matters which concern them. Duties, which are divided in a joint family because of presence of grandparents, uncles, aunts and siblings become concentrated with the parents. As the nuclear family is far away from the rest of the family and relatives, the larger community of neighbours, colleagues, friends etc. become important. The family members need to adjust and adapt to them harmoniously.

Concept of Health

Health is the state of being free from disease. But this is not a complete definition of health.

According to the World Health Organisation: "Health is a state of complete physical, mental and social well-being and not merely an absence of disease."

What does this mean?

It means that health includes being physically fit, mentally relaxed, happy and free from worries and socially one is able to get along with people, have confidence in dealings with other people in society, help others and is sensitive to their needs.

Indicators of good health

These are as follows: Good health Physical Mental Social - energetic - happy - get along well with others - good posture - contented - pleasant mannerism - normal weight and height - confident - help others - body organs functioning - sensitive to other - fulfil responsibility normally people's needs. towards others - clear, clean skin - free from tensions and anxieties - bright eyes - relaxed - shining hair - clean breath - good appetite - good sleep

Factors contributing to health of the family

A family includes the young and old, men and women, each with different needs and health requirements. Let us discuss requirements for good health of a family here.

1) Nutritious Food

Why do we need food?

We need to eat so that we get energy, build muscles and bones and protect our body from disease. We must eat a balanced diet, which means our food must have carbohydrates, proteins, fats, vitamins and minerals in the right quantity. The 'right quantity' depends on the age, sex, work of a person, status of health etc. A growing child needs more protein, an adult needs more carbohydrate, sick people need different types of food depending on the disease. A person with diabetes should not be given sweets.

Food eaten at the proper time is a healthy habit. We should avoid eating in between meals. Children should be encouraged to eat fruits and vegetables and less of fried and 'fast' food like hamburgers and pizzas. Consumption of sweets, chocolates and 'cola' drinks should be minimal.

2) Personal Hygiene

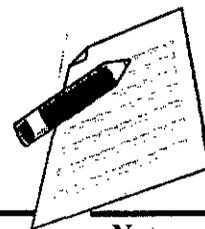
There are four major aspects of personal hygiene: (i) Cleanliness (ii) Physical exercise (iii) Rest and sleep (iv) Healthy habits

Let us study more about these aspects.

- **Cleanliness Hands:** These must be cleaned regularly. We are continually handling a variety of things like furniture, books, coins, currency notes, animals etc. All these carry germs which may be picked up by your hand and fingers and transferred over other parts of the body or into your mouth through food.
- To avoid getting any infection through these modes remember the following:
- Never put your fingers into your mouth.
- Never turn the page of your book or newspaper by applying saliva to your finger and likewise never count the currency notes in a similar manner.
- Any time holding the currency notes or other objects in between the lips is even more risky as you may catch germs.
- After using toilets (latrines) always wash your hands very well with soap or with clean charcoal ash but never with any soil (mitti).
- Indian culture of washing hands before and after meals is certainly a hygienic practice, which must never be forgotten.
- Shaking hands, though very common, is a potential source of transmission of germs.

Skin: In order to keep the skin healthy takes a bath daily because regular bathing does the following:

- Keeps the skin clean and free of germs
- Removes the body odours given out in perspiration
- Keeps the sweat pores open Also, change undergarments daily and wash them daily. Use handkerchief/ disposable napkins for nose.





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Hair: The hair should be kept clean by frequent washing and regular combing. This keeps them healthy and free of parasites (like the head lice) and dandruff. Applying oil to the hair in moderate quantities at frequent intervals is required.

Teeth: The teeth should be cleaned at least twice a day, i.e., before going to bed, at night and after getting up in the morning. The mouth should be washed after every meal. This removes most of the extra food particles stuck in between the teeth. Too many sweets and chocolates are harmful to both your teeth and gums. When teeth and gums are not clean and healthy one is likely to get bad breath.

Breathing by nose: Always breathe by nose and never by mouth. Your nose filters out the dirt and germs from the in-going air, thus protecting you from many diseases.

Eyes: The eyes must be cleaned and washed with clear water two or three times every day. Otherwise, sticky white/yellow dirt sticks on inner sides of the eyes. Never share towels with others, even in the same family. Applying kajal may sometimes lead to eye infections specially if the same applying stick is shared by others.

Ears: The ears should be kept clean. If you do not wash ears every day you can see dirt depositing on the insides of the ears. The wax inside may be cleaned by a soft moistened swab (phurari). Never put pointed object into your ears.

Nails: Nature has provided nails for efficient working of fingers in holding and manipulating objects. These are also an item of personal beauty. But long or untrimmed nails gather dirt and germs underneath. So, always keep your nails trimmed and clean.

3. Physical Exercise

Some kind of physical exercise is necessary for all age groups. Children, adolescents and the young specially need it. Physical exercise improves blood circulation. As a result, all the organs of the body receive the required oxygen and nourishment for normal healthy growth. There are a variety of physical exercises to suit you:

- Brisk walking, running or jogging, aerobics, yoga, etc.
- Playing fast games like kabaddi, kho-kho, football, hockey and other such sports. Wrestling, dund-baithak, judo, karate, etc. For older people long gentle walks and yogasanas are excellent for keeping fit.

4. Posture Correct

posture is also important for health as well as for impressive personality. You know that posture means the manner in which one sits, walks, stands and works. You must learn to sit, stand and walk with your back straight and shoulders stretched.

5. Rest and Sleep

During the day you work a lot and your body muscles get tired. Similarly, your brain too gets tired because you read and memorize and do so many other things mentally. Resting for a short while after intense work and sleep at night refreshes your body for more work the next day. Sleep provides a good rest not only to the tired brain but also to the fatigued body muscles.

How much to sleep?

Very young infants sleep for most of the day.

For the adults 6-7 hours of continuous sleep is sufficient. The room or the place where you sleep should be well ventilated to allow fresh air to come in, also it should be free of noise and disturbance.

6. Healthy Habits

You should develop good habits. Some important ones are as follows:

- Take your food at regular hours
- Go to bed at regular timings
- Clear your bowels (passing stools) every day, preferably in the mornings.
- Say 'no' to any temptation of even just trying once to taste drugs (stimulants and sedatives). Similarly, don't smoke or chew tobacco or even eat pan masala and keep away from alcoholic drinks.
- Never spit, urinate or defecate on the roadside or in public. Use only public latrines and that too carefully, without making them dirty.

7. Sanitation - Keeping the Surroundings Clean

Sanitation means not to allow our surroundings to become dirty. What are the things that can make your surroundings dirty?

(i) From your homes

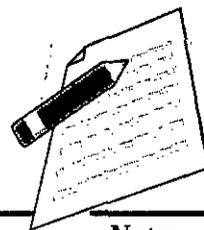
- Kitchen waste, peel of vegetables and fruits
- Occasionally, the discarded stale food
- Water after washings of utensils
- Out flowing bathroom water
- Human excreta, though normally flushed into sewers if provided, or into the soak pits, or in very rare cases disposed of manually in dry latrines.
- Sometimes, deliberately killed dead rats, cockroaches, etc.
- Some waste paper, waste packing bags and tins.
- Sometimes plant wastes if there happens to be any kitchen garden or flower beds.

(ii) Garbage outside-on roads and streets

- Leaves fallen off from roadside trees and bird droppings
- Animals excreta. Stray animals such as cows, buffaloes and street dogs pass out faeces and urine. At times even the owners of pet dogs take them out and let them ease at public places.
- Occasionally dead animals like cats' dogs or cattle may just be left in the open to rot for some days.
- Sometimes deliberately thrown out domestic waste articles.

(iii) Garbage inside your schools

Almost all the things as listed above under homes can be found in a school also. There may even be kitchen refuse if there happens to be a canteen or a refreshment stall in the school. What happens if your surroundings are dirty? If your surroundings are dirty, having rotten things, choked drains and accumulated dirty and stinking water, it presents an ugly look. Besides, these are the breeding places for insects and a whole lot of disease-





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producing germs grow there. People living or working in such conditions often suffer from a variety of diseases such as cholera, jaundice, malaria and tuberculosis.

(iv) Climate and Clothing: Wearing clothes according to season is also important to maintain good health. You know clothes protect you from extreme heat and cold. Besides, clothes must be clean or else will cause problems of skin. Wear cottons in summer. It keeps the skin comfortable because it absorbs perspiration and dries up quickly to keep the body cool and dry. Wool keeps you warm and protects you from cold during winters.

Concept of Security

Security means safety to life. It can be physical and psychological or mental. You know that physical security is safety of the body and its processes. It has a direct bearing on health. When air around you are polluted or the water you drink or the food that you eat is infected with germs you can fall sick. If the floor is slippery or when the roof top is unprotected you can fall and hurt yourself.

The electric wiring, the gadgets, the plug points, the sharp tools and the fire in the kitchen, the broken glass/glass panes, etc., that you use or come in contact with can be a source of injury to your body. For protecting your body, you have to make sure that your house/school, is a safe place to live and work and you yourself follow the rules of safety. Not only that, you also make others follow rules of safety.

Psychological/mental security is about how you feel about yourself and everybody around you. It depends on how you have been brought up. Parents try to bring up children with loving care. They only socialize them i.e., teach them about family, relationships, rituals and rules of the society. They also inculcate in them the values and ethics of living with others and disciplining self. When children grow up in such an environment, they are emotionally stable and contented.

They become socially mature enough to get along with everybody around them. They respect all and have a positive image of self. They are ready to face any eventuality – success or failure. When they fail, they know that their families are behind them. These days in many urban homes with nuclear families, both parents are working. Children in these homes come back to empty house and fend for themselves for at least three to four hours. Contact between parents/adults and children is important and this can be through telephone and/or a good neighbour. Otherwise, children can indulge in mischief or go astray.

When parents are home, both working or non-working mothers, need to spend some quality time with their children. During this time, they can listen to their child's narration of what happened during the day, if they have attended to their homework, if they need anything for next day or need to prepare for a test etc. They can also share with them about their own interesting experiences and happenings.

This whole exercise is to bring the children and parents close to each other, to give children a feeling that parents feel concerned, love and support them in any situation. Needless to say, all this is an investment by parents to raise mentally secure children.



Notes

Safety from child abuse

Child abuse can be physical, sexual or mental. In any form it is forbidden and against the safety of the child. Physical abuse is when adults beat the child or punish by locking in a room, making the child sit in a particular position for long hours.

Sexual abuse means involving or forcing children into forbidden sexual activities.

Mental abuse on the other hand is giving mental torture to the child. Calling a child good for nothing, emotionally blackmailing, socially boycotting the child and so on are forms of mental abuse. Children should have protection from all these.

Safety from smoking, alcohol and drugs

Smoking, drinking alcohol and taking drugs generally start with peer pressure and for the sake of fun. But one soon gets into a habit of taking these and then there is no return. When anyone smokes, one inhales carbon monoxide and nicotine, both harmful for the respiratory system leading to cancer of mouth and lung. Consumption of alcohol leads to hardening of arteries leading to a heart attack.

Drugs may be beneficial when administered under a doctor's supervision. They are stopped as soon as treatment is over. But the continued use of drugs like cocaine, morphine etc., produce addiction which in the long run can be fatal. Breaking the habit of smoking and taking alcohol and drugs is very difficult but can be done under supervision and with a lot of support from concerned family member.

Home and Safety

Many accidents happen to people in their homes. People can hurt themselves by falling over or by burning themselves. Children may drink some of the poisonous things that we keep in the house such as insecticides or acids. One of the most serious dangers is from fire. A room may catch fire because of a heater that tips over or malfunctions. Some very serious house fires start with a cigarette. Electrical wiring that is not properly done can also cause fires. It can also give you an electric shock.

SUMMARY

The oldest and most common human institution, 'family' is the most important group to which most people ever belong. Each one of us is born into a family – with a father, mother, may be grandparents, uncles, aunts and siblings. Among them we feel protected, wanted and loved. In a family we are cared for and feel emotionally and financially secure. Family teaches us how to interact and get along with others, obey and respect elders. It helps in learning customs and traditions and imbibing values and culture which are passed on from one generation to the next. Health is the state of being free from disease. But, this is not a complete definition of health. According to the World Health Organisation: "Health is a state of complete physical, mental and social well-being and not merely an absence of disease." It means that health includes being physically fit, mentally relaxed, happy and free from worries and socially one is able to get along with people, have confidence in dealings with other people in society, help others and is sensitive to their needs. Security means safety to life. It can be physical and psychological or mental. You know that physical security is safety of the

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body and its processes. It has a direct bearing on health. When air around you are polluted or the water you drink or the food that you eat is infected with germs you can fall sick. If the floor is slippery or when the roof top is unprotected you can fall and hurt yourself. The electric wiring, the gadgets, the plug points, the sharp tools and the fire in the kitchen, the broken glass/glass panes, etc., that you use or come in contact with can be a source of injury to your body. For protecting your body, you have to make sure that your house/school, is a safe place to live and work and you yourself follow the rules of safety. Not only that, you also make others follow rules of safety.

EXERCISE

Multiple Choice Questions

Pick the correct alternatives.

Give reasons for your selection.

- i) In a joint family the purse is
- (a) common for the whole family
 - (b) with every head of small unit
 - (c) with every female head of small unit
 - (d) with both male and female heads
- (ii) In a joint family all the decisions are made by
- (a) only male head of the family
 - (b) only female head of the family
 - (c) both male and female head of the family
 - (d) all members of the family
- (iii) In a joint family property is owned by
- (a) only male head of the family
 - (b) only female head of the family
 - (c) both male and female head of the family
 - (d) all members of the family

Answers:- i) a ii) a iii) d

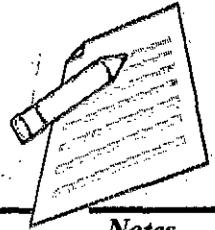
Review Questions

1. Define family?
2. Explain the types of family?
3. Define health?
4. Define Security?
5. Explain in details the nuclear family?
6. Discuss the importance of health?
7. Explain the methods of providing safety?
8. Discuss the factors contributing to health?

Activity: Look around and observe the type of families in your neighbourhood. Observe the members in any two families. Record the following information.

- Who is the head of the family
- Who controls the finances
- Are both partners working
- Who is the decision maker
- Who mostly does household chores
- Who does the shopping
- Who takes care of children

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1st
2nd

3

ETHICS IN DAILY LIVING

Ethics in Daily Living: definition and need, problems face, code of ethics, raising ethical standards

- Understand the concept of Ethics.
- Discuss the types of problem faced in daily life.
- Describe the code of ethics.
- Discuss the ethical standards.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of ethics in daily life family so that the fundamentals of family can be learned.

Ethics

Introduction

The word ethics deals with moral issues and with right and wrong behaviour. Ethics tell us about our moral duties and obligations so that our behaviour at work or at home is right, truthful and just. Ethics are a set of standards and rules that are required by an individual for leading a satisfactory family life and being a good worker.

Therefore, you require a set of ethics at home as well as at your work place. You can observe the ethical behaviour through the following habits.

- sincerity
- honesty
- truthfulness
- respect for self and others
- respect for time
- respect for work
- respect for our environment
- Besides these ethics in our domestic life, our work place demands certain specific ethics. These are:
 - regularity and punctuality
 - confidentiality
 - loyalty
 - maintaining cordial relations with colleagues and clients
 - willingness to learn and take on new responsibilities



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Need for ethics

Now let us find out why it is essential to have good ethics and how they affect our interpersonal relationship and work performance. Any work situation either at the office or at home has three major components: Work, Worker and the Work Place.

- The Work is the actual task to be done.
- The Worker is the person who does the task.
- Work Place includes the place for doing the task, tools and equipment's required and the storage space for them.

You will agree that all the three components are inter-related and dependent on each other. Further, you will also agree that the Worker is the most important component of any work situation. This is so because only the Worker has the ability to think, analyse, learn and manipulate. A Worker can acquire the art of effective management of the Work, the Work Place, himself/herself and the other Workers. A Worker can also be disloyal, lazy, a bad manager of the Work Place and thus ruin the business. Thus, for the successful achievement of our goals and objectives, efficient utilisation of our resources and to maintain discipline at home and at work, we need to develop and adopt certain work ethics. These work ethics help us to do a task to the best of our ability in a fair, just and impartial way. They encourage us to develop and maintain a cordial work environment where all the people can enjoy each other's support and confidence.

Ethical problems in family life and at work

Some of the ethical problems commonly faced by us when we visit any work place where workers:

- are irregular and lack punctuality
- are rude and impolite
- have inadequate knowledge and skill
- waste resources
- disregard rules and regulations
- disrespect the task at hand
- are disloyal

(a) Irregularity and Lack of Punctuality

Irregularity and lack of punctuality are problems which you encounter frequently in any work situation. Look around yourself and you may come across people who get up late in the morning and are unable to send their children to school on time. They may also not be able to provide their family members with proper meals and have disorganised homes due to their irregular behaviour and lack of punctuality.

Such people frequently absent themselves from work. Others like to come in late and leave early as a matter of habit or right. Some workers are never found at their seat during working hours. You may have witnessed the inconvenience caused to the public wanting to pay bills when counter clerks are either late or not found at their seats in banks, post offices, and telephone and electricity offices. The irresponsible behaviour of such people spoils the discipline of the work environment, sets bad examples, causes inconvenience to the public and lowers the image of the organisation.



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Are you regular and punctual in studying and completing your lessons and exercises? If not, you will not be able to perform well in your exams and will then feel unhappy about it. You should also understand that this will affect your future career prospects.

(b) Rude and Impolite Behaviour

Sometimes certain family members are in the habit of being rude and aggressive. Not only does this destroy the peaceful atmosphere at home but also creates a bad name for the family. How would you react when the clerk at an office counter does not listen to your request carefully, telling you that he is busy, and asks you to come later? Would you like to associate with a colleague in your office who refuses to do her part of the work, talks rudely, misbehaves with other colleagues and is always in an aggressive mood? Rude and impolite behaviour of staff can be quite disturbing and embarrassing for an organisation.

(c) Inadequate Knowledge and Skill

Many people project that they have special skills and knowledge to impress others and enhance their job prospects. Suppose you have access to a computer but do not know how to operate it, yet you insist on operating it, who would be responsible if it gets spoiled? Many people claim to be qualified doctors and treat patients for illnesses about which they know nothing. As a result, they can endanger a patient's life. Often people claim to be electricians without any knowledge about electricity or machines and cause heavy losses. Knowing your job is very important.

One should not only be skilled at one's job but also be ready to learn more about it and update one's knowledge and skills from time to time. Inadequate knowledge about nutrition, home appliances, medicines and cleaning agents can sometimes cause serious mishaps at home. Further, lack of knowledge of safety and first aid measures can also be very dangerous. For example, you may get an electric shock while handling a plug with exposed wiring, if you are not aware of the potential hazard of doing such a task.

Lack of knowledge about good nutrition and a balanced diet can cause several deficiency diseases like night blindness, goitre, etc. in your family. Similarly, learning your lessons sincerely will add to your knowledge and doing the suggested activities will help you to develop the skills you need to perform well.

(d) Wastage of Resources

You have already learnt in a previous lesson that many of our resources are limited. Some homemakers are in the habit of over estimating and thereby wasting a lot of cooked food. Sometimes, due to improper storage, raw ingredients get spoiled and have to be thrown. Some people take large servings on their plates and leave uneaten food when they are not able to eat it. Making unplanned and frequent trips to the market without preparing a shopping list leads to a wastage of your time and energy, and fuel if you go by a vehicle.

Lights and fans left running, without anybody using them, are a common sight in many offices. Items of office stationery being misused and thrown around are also a common sight. Misuse of office telephones and vehicles for personal work is a common occurrence. You may have also noticed that people do not close taps after drinking water. All this is a wastage of our precious resources.



(e) Disregard for Rules and Regulations

You may have observed that in some homes special treatment is given to sons in comparison to daughters. Often parents show favouritism towards a particular child. Have you noticed a difference in the treatment of a daughter and a daughter-in-law in some families? In certain situations, mentally and physically challenged individuals are discriminated against normal ones, both at home and outside. Some people consider disregard for family norms and culture as signs of modernity. Can you give some more such examples? In many work situations one finds that the rules and regulations laid down for maintaining discipline, good employer-employee relationship and team spirit are disregarded.

This is usually observed when promotions are given out of turn, or the management shows favouritism. In some work places you may find that people are discriminated against because of their caste, sex or physical handicap. In many cases women and children are paid less than men for the same job. Employing children in hazardous industries like manufacture of fire crackers, chanks, etc., despite strict government regulations is also unethical. Some students do not complete their assignments themselves and get them done by others or copy other students' work. Besides this, you may have observed some people cheating during examination.

This is against the rules and procedures laid down by the examining body and therefore, not ethical. Disregard of rules and regulations often leads to serious situations at home and in the workplace.

(f) Disrespect for the Job

"Oh! I am only a housewife, I don't work". "I am just a simple clerk!" Have you come across people who feel ashamed about the job they are doing and talk like this? You must have wondered why they feel ashamed. In our society, it is a common practice to consider some jobs respectable and others less respectable; some jobs high and others lowly. As a result, many people, despite enjoying their work, do not want to tell others about it for the fear of being looked down upon. A housewife's contribution to the successful running of a home is not given due respect by her family and the society in general.

Let's take another example, a man selling drinking water on the roadside should feel proud of doing so. Similarly, the passers-by must not feel that supplying drinking water on the roadside is a job to be looked down upon. As a student of Home Science, you should respect your course as it is multi-disciplinary, practical and career-oriented. You must have realised the value of studying Home Science in the first lesson of your course.

(g) Disloyalty

Disclosing your family's secrets and maligning family members in public are considered signs of disloyalty to the family. Taking away common funds and setting up something for you 'interest' is yet another way of being disloyal to one's family. In offices, some staff members indulge in activities that are harmful to the success of the organisation they work for. For instance, a chemical engineer may quietly sell the secret formula of a new product to a rival company for some quick extra money.

A corrupt union leader may call for a strike of mill workers, thereby stopping production at the mill leading to heavy losses. Taking bribes to grant special favours to certain companies and people at the cost of one's own organisation is a common



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occurrence today. Cheating one's employer and working for someone else while being in the employment of another are other examples of disloyalty. Can you think of some more examples of disloyal behaviour?

Code of ethics

A list of clearly stated rules, standards and principles to guide our behaviour at home and in public is called a Code of Ethics. A code of ethics can be developed through mutual agreement of the persons involved. The following is an example of a code of work ethics for us to understand and follow diligently, both at work and at home.

- Be regular and punctual at work and at home.
- Do the task assigned to you.
- Be polite, patient, courteous and respectful to all.
- Acquire the knowledge and skills necessary to do the task assigned to you.
- Be prepared to learn more and update yourself.
- Find more and more efficient ways of getting your work done.
- Manage and apply your resources efficiently. Do not waste resources.
- Follow the rules, policies and procedures of your work strictly and uniformly.
- Do not indulge in favouritism and discrimination while doing your duty. Treat everyone equally.
- Have respect for all kinds of work.
- Do not accept favours that may negatively influence the performance of your work.
- Be loyal to your work and to the organisation to which you belong.
- Expose corruption wherever you encounter it. Let us take a pledge today, that we will follow this Code of Ethics every day.

Raising ethical standards

What suggestions can you give to raise people's ethical standards? Well, read the following suggestions and see if you agree with them.

(a) Public Disclosure and Publicity

Unethical and corrupt workers should be held responsible for their actions. Such irresponsible people should be exposed and they should be criticised and/or suitably punished. Withdrawal of certain privileges and benefits may force them to mend their ways. Bringing their wrongdoings to the notice of family members and colleagues can also create social embarrassment for them. This would also act as a warning for others who may be becoming slack.

(b) Preparation of a 'Code of Ethics

A clear statement of the ethics in any situation and their strict implementation is very vital. Such a code of work ethics makes our expectations clearly known to others. For example, if the code of ethics is written and displayed on a board in the front office of an organisation, the employee will be able to see and follow them. This way the employees will be able to apply and integrate ethical concepts into their work.

(c) Teaching of Ethics and Values in Schools and Colleges

So far ethics were expected to be learnt by a worker on his own, through experience and informal guidance from others in the office. Today, with cut throat competition, multiple challenges and a fast-changing environment, it is important that everyone should be well trained and efficient. Only then can we give good work performance and expect to rise in our life.

Therefore, teaching of moral values and ethics should form a part of our lives at an early stage. This way we will be able to develop as disciplined citizens and build our nation. Starting from an early age also means developing values as habits. And you know that habits are difficult to get rid of. After going through this lesson, have you learnt more about ethics and ethical practices? Don't you think that we should follow a code of ethics to improve our personal and professional life?

SUMMARY

The word ethics deals with moral issues and with right and wrong behaviour. Ethics tell us about our moral duties and obligations so that our behaviour at work or at home is right, truthful and just. Ethics are a set of standards and rules that are required by an individual for leading a satisfactory family life and being a good worker. Therefore, you require a set of ethics at home as well as at your work place. A list of clearly stated rules, standards and principles to guide our behaviour at home and in public is called a Code of Ethics. A code of ethics can be developed through mutual agreement of the persons involved. So far ethics were expected to be learnt by a worker on his own, through experience and informal guidance from others in the office. Today, with cut throat competition, multiple challenges and a fast-changing environment, it is important that everyone should be well trained and efficient. Only then can we give good work performance and expect to rise in our life. Therefore, teaching of moral values and ethics should form a part of our lives at an early stage. This way we will be able to develop as disciplined citizens and build our nation. Starting from an early age also means developing values as habits.

EXERCISE

Multiple Choice Questions

Select the most appropriate answer from the choices given in order to complete the sentences-

- (1) Work ethics means
 - (a) morality
 - (b) efficiency
 - (c) competence
 - (d) justice
- (2) Work ethics means
 - (a) a set of rules and standards
 - (b) a set of norms and standards
 - (c) right decisions and standards
 - (d) a set of rules and right decisions
- (3) Three components of the work situation are Worker, Workplace and
 - (a) rules
 - (b) procedures
 - (c) work
 - (d) co-workers



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- (4). Separate the following as general ethics and work ethics :
- (i) regularity (ii) sincerity (iii) punctuality (iv) loyalty (v) confidentiality (vi) self-respect (vii) respect for the environment (viii) truthfulness.
- (5). Tick marks the statements which are ethically not correct.
- (a) Making STD calls to relatives from your office
 - (b) Bank clerk opening the counter on time
 - (c) Bank clerks shunting you from counter to counter
 - (d) Going to a party in the office vehicle without making an entry in the log book.
 - (e) Closing the tap while brushing your teeth.
 - (f) Employees working as a team
 - (g) Out of turn promotions
 - (h) Bribing an official to get work done
 - (i) Jumping the queue

Answers:-

- 1). (a)
- 2). (a)
- 3). (b)
- 4). General Ethics: (ii) (vi) (vii) (viii). Work Ethics: (i) (iii) (iv) (v).
- 5). (a) (c) (d) (g) (h) (i)

Review Questions

- 1. Define Ethics?
- 2. Explain code of ethics?
- 3. Write a short note on how to raise ethical standards?
- 4. Discuss the need of ethics?
- 5. Explain the importance of code of ethics?
- 6. Mention five personal qualities that contribute to good work ethics?

Activity: Visit any work place (like an office, shop, police station, etc.) and make a note of four ethical and four unethical practices followed there.



Notes

4

FOOD, NUTRITION AND HEALTH

Food, Nutrition and Health:-definition and functions of food, sources and requirements of nutrients, deficiency of nutrients, relationship between food, nutrition and health

- Understand the concept of food.
- Discuss the functions of food.
- Describe the sources of nutrients.
- Discuss the deficiency of nutrients.

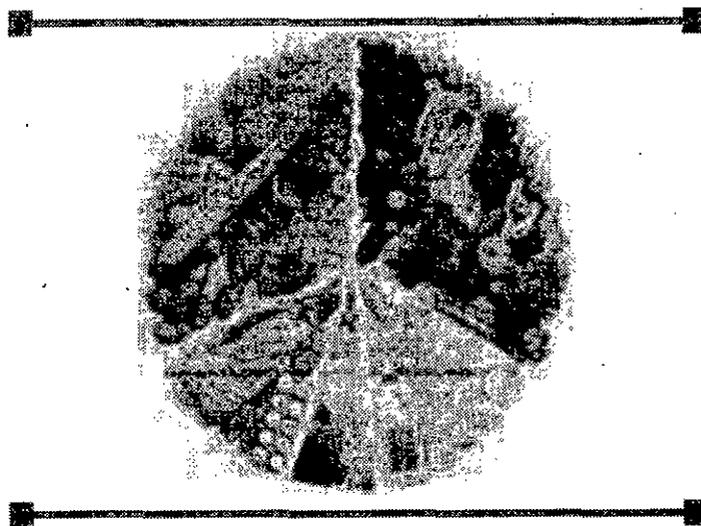
Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of food, nutrients and health and so that the relationship between food, nutrients and health can be learned.

Food

Introduction

Food has been a necessity for human survival since the very beginning of the world. Food is required for every living creature. Good food is reflected by optimum health and wellbeing.



In early times man ate food most naturally. Fruits, vegetables, cereals, pulses, fats, oils or sugars were all consumed as they were available without any refinement or processing. Later man discovered methods of cooking and also preserving food according to his need.



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By accident man discovered fire and then experimented and began to cook non-vegetarian foods like fish, meat etc. by direct roasting on fire. This was followed by salting food and dehydration of foods as preservation techniques.

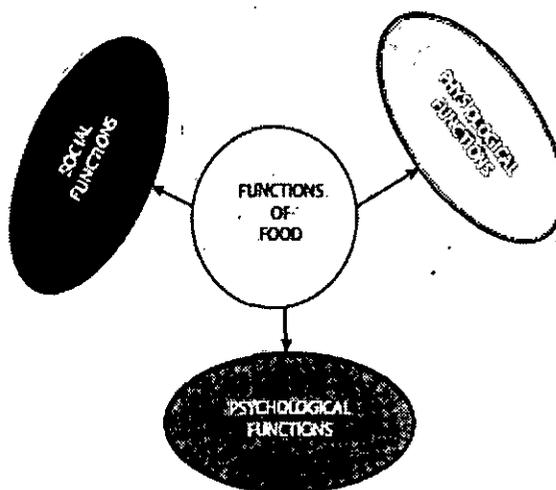
The importance of food gave rise to a science called "food science". This is "a discipline in which the engineering, biological and physical sciences are used to study the nature of foods, the causes of deterioration, the principles underlying food processing, and the improvement of foods for the consuming public".

Food has been a basic part of our survival. Next to air and water, food is the utmost important thing for survival. Food is essential for growth, development, active and healthy life of an individual. Through, centuries, food has also been used, as an expression of love, friendship and social acceptance.

Food refers to anything, which nourishes the body. It would include solids, semi-solids and liquids which when consumed help to sustain the body and keep it healthy. Food is a substance, which after ingestion, digestion and absorption is capable of being utilized by the body for its various functions.

Functions of Food

Food is classified according to their functions in the body as shown in Figure 1



▲ Fig 1 Functions of food

1. Physiological Functions of Food

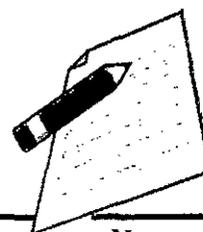
The physiological functions of food can be further sub divided as follows

- a. Energy yielding foods
- b. Body building foods
- c. Protective and regulatory food.

a. Energy Yielding Foods

Food Sources: Cereals, millets, roots and tubers, sweets, jaggery and sugar, fats and oils.

Energy is mainly provided to our body through carbohydrates and fats in the food.



Carbohydrates and fats provide energy to sustain involuntary processes in the body for continuous life, to carry out voluntary activities like professional, household and recreational activities and to convert food ingested into usable nutrients in the body. The energy needed is metabolized by oxidation of foods consumed.

b) Body building foods

Food Sources: Pulses, Legumes, meat, fish, poultry, egg, milk and milk products.

In our body there is continuous break-down of old tissues and building up of new tissues going on at all ages irrespective of the apparent growth thus maintaining a need for body building nutrients.

For the body building purpose, the major nutrients are proteins and minerals. Foods rich in protein are called body building foods. Milk, meat, egg and fish are rich in proteins of high quality due to the presence of essential amino acids. Pulses and nuts are good sources of protein but the protein is not of good quality because they lack some of the essential amino acids which are rich in cereals.

c) Regulatory and protective function of foods

Food Sources: Vegetables and fruits.

These foods regulate the activities of the body such as beating of the heart, maintenance of body temperature, muscle contraction, control of water balance, clotting of blood, removal of waste products from the body, etc.

Our body uses water in all its cells, organs and tissues to help regulate its temperature and maintain other bodily functions. Our body loses water through breathing, sweating and digestion, it's important to rehydrate by drinking fluids and eating foods that contain water.

Dietary fibres found mainly in fruits and vegetables, whole grains and legumes provide health benefits such as relieving constipation, maintaining healthy weight and lowering the risk of diabetes and heart diseases.

Apart from regulating our body processes, food also protects us from various infections, diseases and injuries.

2. Psychological Functions of Food

The second major function of food is psychological function. Food also satisfies certain psychological needs of human beings. Foods indirectly helps to provide a sense of security, love and acceptance.

Every one grows in a particular culture with its own unique food habits. The person begins to associate the food habits and foods commonly consumed as it gives a sense of security and satiety. Even a nutritionally balanced meal may not be satisfying to the individual, if food included is unfamiliar or distasteful.

3. Social Functions of Food

Food is also a symbol of social life. When a meal is shared with anyone else, the acceptance of friendship and respect for that person are expressed.

Earlier only persons enjoying equal status in society ate together. A person would never share a meal with someone inferior to him in social terms.



Food is a medium through which happiness is expressed. For example, feasts are given at specific states of life such as birthday, marriage etc. Sweets are also distributed and exchanged to mark certain auspicious occasions like festivals. Such gatherings bring people together and help to strengthen mutual friendship.

Sources and Requirements of Nutrients

A person's body cannot produce everything that it needs to function. There are six essential nutrients that people need to consume through dietary sources to maintain optimal health. The World Health Organization (WHO) note that essential nutrients are crucial in supporting a person's reproduction, good health, and growth. The WHO divide these essential nutrients into two categories: micronutrients and macronutrients.

Micronutrients are nutrients that a person needs in small doses. Micronutrients consist of vitamins and minerals. Although the body only needs small amounts of them, a deficiency can cause ill health.

Macronutrients are nutrients that a person needs in larger amounts. Macronutrients include water, protein, carbohydrates, and fats.

The six essential nutrients are vitamins, minerals, protein, fats, water, and carbohydrates.

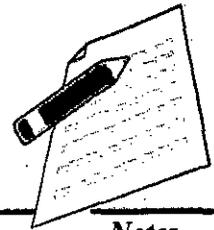
Vitamins



Vitamins are micronutrients that offer a range of health benefits, including:

- boosting the immune system
- helping prevent or delay certain cancers, such as prostate cancer
- strengthening teeth and bones
- aiding calcium absorption
- maintaining healthy skin
- helping the body metabolize proteins and carbs
- supporting healthy blood
- aiding brain and nervous system functioning

There are 13 essential vitamins that nutritionists divide into two groups: fat soluble and water soluble.



Fat soluble vitamins are:

- vitamin A
- vitamin D
- vitamin E
- vitamin K

Water soluble vitamins are:

- vitamin B-1 (thiamine)
- vitamin B-12 (cyanocobalamin)
- vitamin B-6
- vitamin B-2 (riboflavin)
- vitamin B-5 (pantothenic acid)
- vitamin B-3 (niacin)
- vitamin B-9 (folate, folic acid)
- vitamin B-7 (biotin)
- vitamin C

Typically, a person who eats a diet rich in vegetables, fruits, and lean proteins can get all the vitamins they need in their food. However, those who eat less fruit and vegetables, and those with digestive conditions may need to take a vitamin supplement to reduce or avoid a deficiency.

Minerals

Minerals are the second type of micronutrients. There are two groups of minerals: major and trace minerals. The body needs a balance of minerals from both groups for optimal health.

Major minerals are:

- magnesium
- calcium
- phosphorus
- Sulphur
- sodium
- potassium
- chloride

Major minerals help the body to do the following:

- balance water levels
- maintain healthy skin, hair, and nails
- improve bone health

Trace minerals are:

- iron
- selenium

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- zinc
- manganese
- chromium
- copper
- iodine
- fluoride
- molybdenum

Trace minerals help with:

- strengthening bones
- preventing tooth decay
- aiding in blood clotting
- helping to carry oxygen
- supporting the immune system
- supporting healthy blood pressure

A person can ensure they consume enough minerals by including the following foods in their diet.

- red meats (limit their use and choose lean cuts)
- seafood
- iodized table salt (less than 2,300 milligrams a day)
- milk and other dairy products
- nuts and seeds
- vegetables
- leafy greens
- fruits
- poultry
- fortified bread and cereals
- egg yolks
- whole grains
- beans and legumes

Protein

- Protein is a macronutrient that every cell in the body needs to function properly.
- Proteins carry out a variety of functions, including:
 - ensuring the growth and development of muscles, bones, hair, and skin
 - forming antibodies, hormones, and other essential substances
 - serving as a fuel source for cells and tissues when needed



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A person can take in proteins through their diet. The following foods are good sources of protein:

- red meats (limit their use and choose lean cuts)
- poultry, including chicken and turkey
- fish and other seafood
- beans and legumes
- eggs
- dairy products
- soy
- nuts
- some grains, including quinoa

Although meats and fish tend to contain the highest levels of protein, vegans and vegetarians can get enough protein from various plant products.

Fats

People often associate high fat foods with bad health. However, a person needs certain fats to help maintain optimal health.

Fats provide the body with energy and help it carry out a range of functions. However, it is essential to consume healthful fats, such as monounsaturated and polyunsaturated fats and limit or avoid saturated and trans fats.

Healthful fats help with the following functions:

- cell growth
- blood clotting
- building new cells
- reducing the risk of heart disease and type 2 diabetes
- muscle movement



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- balance blood sugar
- brain functioning
- mineral and vitamin absorption
- hormone production
- immune function

According to recent Dietary Guidelines for Americans, a person should consume 20–35% of their calories from healthful fats.

A person can find healthful fats in several foods, including:

- nuts
- fish, such as salmon and tuna
- vegetable oils
- coconut oil
- seeds

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Carbohydrates

Carbohydrates are essential to the body. They are sugars or starches that provide energy for all the cells and tissues in the body.

There are two different types of carbohydrates: simple and complex. People should limit their intake of simple carbohydrates, such as white bread, pasta, and rice. However, the body needs complex carbohydrates to support the following:

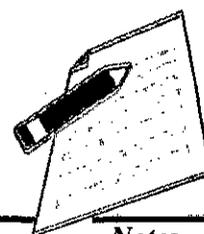
- the immune system
- brain function
- the nervous system
- energy to perform tasks
- digestive function

The Dietary Guidelines for Americans recommend a person consumes 45–65% of their daily calories from complex carbohydrates.

The following foods contain complex carbohydrates:

- quinoa
- brown rice
- vegetables
- whole grain pasta, bread, and other baked goods
- oatmeal
- fruits
- barley

People should avoid overly processed products that contain bleached, white flour, and foods with added sugar.



Water is probably the most important essential nutrient that a person needs. A person can only survive a few days without consuming water. Even slight dehydration can cause headaches and impaired physical and mental functioning.

The human body is made up of mostly water, and every cell requires water to function. Water helps with several functions, including:

flushing toxins out

- shock absorption
- transporting nutrients
- preventing constipation
- lubrication
- hydration

The best source for water is to drink natural, unsweetened water from the tap or bottled sources. For people who do not like the taste of plain water, they can add a squeeze of lemon or other citrus fruits. Also, a person can get extra water by consuming fruits that contain a large amount of water. People should avoid getting their water intake from sugary drinks. Sugary drinks include sweetened teas, coffees, soda, lemonade, and fruit juices.

Deficiency of Nutrients

1. Carbohydrates

Definition: Carbohydrates are sugars or polymers of sugars such as starch that can be hydrolysed to simple sugars by the action of digestive enzymes or by heating with dilute acids. Generally, but not always, the hydrogen and oxygen in them are in proportion to form water, hence the term carbohydrate.

The predominant function of the carbohydrates is to provide energy needed by our body. Starch found in cereals and sugar in sugarcane and fruits are examples of carbohydrates in foods.



Food Sources: Carbohydrates are found in cereals like Rice, Wheat, Bajra, Jowar. Fruits, Honey and Jaggery, are also rich sources of carbohydrates

2. Proteins:

Definition: The word 'protein' is derived from the Greek word protos meaning 'first'. Protein is the basic chemical unit of living organisms and is essential for nutrition, building of new tissues (growth) and maintaining and repairing of those already built. Casein from milk, albumin in egg and gluten in wheat, are examples of proteins occurring in foods.

Food Sources: Animal foods like Meat, Fish, Eggs and Milk are excellent sources of Proteins. Plant Sources like Pulses, Oil seeds and nuts are also good sources of Protein

Deficiency: Deficiency of protein causes protein energy malnutrition which covers a wide spectrum of clinical stages ranging from the severe forms like kwashiorkor and marasmus to the milder forms like growth retardation. Protein energy malnutrition is due to "food gap" between the intake and requirement. The average energy deficit in Indian children is 300kcal/day. Deficiency of protein is discussed in detail in the section Protein energy malnutrition

3. Lipids/Fats

Definition: Lipids are organic substances soluble in fat solvents such as alcohol, ether, and chloroform but not in water. The term includes fatty acids, soaps, neutral fats, phospholipids, steroids and waxes. Oils found in seeds, butter from milk, and lard from meat, are examples of fats found in foods. **Food Sources:** Visible fat sources are Butter, Ghee and Oil, Invisible fat sources are Cereals, Pulses, Oil seeds, Milk and Egg.

MICRONUTRIENTS

Until the middle of the 19th century the importance of minerals and vitamins was not given adequate emphasis. It was observed that the macronutrients alone were not sufficient to promote and sustain growth. This led to the discovery of the micronutrients namely the minerals and vitamins which are essential for growth and maintenance. Macro minerals are those which are present at levels more than 0.05 percent in the human body. Calcium, Phosphorus, magnesium, sodium and potassium belong to this category. Other minerals present at less than 0.05 percent in the human body are defined as micro minerals. The micro minerals are also known as the trace elements. Some micro minerals are iron, iodine, zinc, copper, fluorine, selenium, chromium, manganese, cobalt and molybdenum.

1. Minerals

The minerals calcium, phosphorus, iron iodine, sodium and others are found in various foods in combination with organic and inorganic compounds. Minerals are necessary for body building, for building bones, teeth and structural parts of soft tissues.

(i) **Calcium Food sources:** Calcium is present in both animal and plant foods. The richest source of calcium among animal foods is milk and among the vegetable sources it is green leafy vegetables. **Health Problems/ Deficiency:**

- **Osteoporosis:** This is a condition associated with a loss in bone density and bone mass which literally means "porous bone". With the ageing process resorption predominates bone formation resulting in osteoporosis. **Osteomalacia:** It is a condition where the quality of the bone is diminished and the quantity of the bone is not compromised.



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- **Osteopenia:** It refers to the bone density that is lower than normal peak density but not low enough to be classified as osteoporosis. The difference between osteopenia and osteoporosis is a matter of severity of the loss of bone density.
- **Tetany:** A decrease in serum calcium levels gives rise to a condition called tetany. The symptoms of tetany are severe intermittent spasms of the muscles of hands and feet accompanied by muscular pain. Twitching of facial muscles occurs.

(ii) Phosphorus

Food Sources: Phosphorus is widely distributed in foods. Milk and meat are rich in phosphorus. Whole grain cereals, legumes, nuts, carrots and fish are also rich sources of phosphorus.

Deficiency: Phosphorus is ubiquitous in various foods that near total starvation is required to produce dietary phosphorus deficiency. Inadequate phosphorus intake is expressed as hypo-phosphoremia which manifests in the form of anaemia, anorexia, muscle weakness, bone pain, rickets, Osteomalacia, general weakness and increased susceptibility to infection.

(iii) Iron

Food sources:

Rich sources of iron are cereals, millets, pulses and green leafy vegetables. Of the cereal grains and millets bajra and ragi are very good sources of iron. Other sources of plant foods include manathakali leaves, rice flakes, mint, soya bean, cow pea, gingelly seeds and dates. Animal food sources include red meat, and fishes like herring and mackerel.

Deficiency

- **Iron Deficiency anaemia:** When there is an insufficiency of iron for the formation of hemoglobin, the RBC's become pale and small. The resulting anaemia is called hypochromic and microcytic anaemia which is the most common form of anaemia throughout the world affecting women mainly in their reproductive years, infants and children.
- **Causes:** Low iron intake, blood loss, malabsorption chronic diseases, obesity
- Regular consumption of iron rich foods, vitamin C rich foods, seasonal fruits and vegetables can definitely prevent anaemia.

(iv) Iodine

Food sources:

Marine fish and eggs are good sources of iodine. Based on the dietary pattern and analysis of raw foods, iodine content of various regional diets ranges from 170-300 µg/day

- **Deficiency:** It covers a collection of disorders at all stages of human growth and development.
- **Goitre:** Goitre is the enlargement of thyroid gland which results when iodine is not available in sufficient quantities to produce normal quantity of thyroxine. It also arises from eating foods (goitrogens) that inhibit the synthesis of thyroxine
- **Cretinism:** A congenital disease resulting from a lack of iodine and thyroxine secretion characterized by physical deformity, dwarfism, mental retardation and often goitres.

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- **Dietary improvement:** Salt iodization remains the most cost-effective way to deliver iodine to both humans and livestock and is credited with eradicating iodine deficiency.
- **Zinc Food sources:** Meat, seafood and liver are good sources of bio-available Zinc. In cereals most of the zinc is found in the outer fiber rich part of the kernel.
- **Deficiency:** The clinical manifestations of severe zinc deficiency in humans are growth retardation, dermatitis, hair loss, diarrhoea, increased infections, delayed wound healing, loss of appetite, hypogeusia (diminished taste) dysgeusia (altered taste) hyposmia (diminished smell). Decreased zinc intake is associated with increased risk of low birth weight and preterm delivery.

2. Vitamins

Fat soluble vitamins A, D, E and K and also water-soluble vitamins C and B group are found in foods. These are needed for growth, normal function of the body and normal body processes.

a. Fat Soluble Vitamins

(a) Vitamin A:

The vitamin A compounds include retinol, retinal and retinoic acid. Because it has a specific function in the retina of the eye and because it is an alcohol it was given the name retinol. Beta carotene is precursor of vitamin A and is found in large quantities in vegetables and fruits.

- **Food sources:** In the animal foods vitamin A is present in the form of retinol which are identified to be liver, cream, butter and egg yolk. Liver oils of fish like cod, halibut and shark are the richest sources of vitamin A. The main contributors of beta carotene are the yellow and green vegetable fruit sources of carotene- carrots, papaya, mango, sweet potatoes, spinach and broccoli.
- **Deficiency:** Decreased Vitamin A intake leads to vision problems
- **Night blindness:** People suffering from night blindness cannot see objects in dim light
- **Xerosis Conjunctiva:** The conjunctiva is dry, thickened, wrinkled and pigmented. This is due to the keratinization of the epithelial cells.
- **Xerosis Cornea:** This manifests in the form of corneal dryness which gives the cornea a dull hazy and lustreless appearance.
- **Bitot's spots:** These are greyish or glistening white plaques occurring in the conjunctiva usually triangular in shape and are found in children.
- **Keratomalacia:** When Xerosis of the conjunctiva and cornea is not treated it may develop into the condition called kerato malacia which is characterized by necrosis, ulceration and bacterial invasion of cornea leading to the total destruction of the eyeball and eventually total blindness.

Prevention of vitamin A deficiency

The strategy should be a combination of long-term nutrition education programme, enhanced intake of vitamin A rich food, improvement in household food security and availability of vitamin A rich foods and a periodic massive dose of vitamin A.



(b) Vitamin D:

Vitamin D is known to be a prohormone of a sterol type and the synthesis of active form of vitamin D is known as the 1,25 – dihydroxycholecalciferol which is accomplished by the combined action of skin, liver and kidneys.

- **Food sources:** Vitamin D is present only in some foods of animal origin. Certain marine fishes and fresh water fishes are known to be good sources of vitamin D. The most important sources are egg yolk, butter, cheese, milk.
- **Deficiency:** Vitamin D deficiency occurs in children who are not adequately exposed to sunlight. It is characterized by inadequate mineralization of the bone. In children the condition is known as rickets and in adults it is called Osteomalacia.
- **Rickets:** In rickets there is softening of the skull bones and the head is enlarged, elongated and flattened on the vertex. Softening of the ribs, sinking of the chest, beaded junctions of the ribs with cartilages (rickety rosary), pigeon chest, knock knees and bow legs. Deformities of the long bones' spine, pelvis, muscles, and feet are observed. Dentition is delayed.
- **Osteomalacia:** It is the adult counterpart of rickets. It occurs in women of child bearing age and in those who consume poor cereal diets deficient in vitamin D and calcium. Besides it is found among those who stay indoors all day and seldom go out in the sun.

(c) Vitamin E:

Vitamin E is the generic name for a group of vitamins, three of which – alpha tocopherol, beta tocopherol and gamma tocopherol display the greatest biologic activity. Of these three, alpha tocopherol is the most significant form of Vitamin E

- **Food sources:** Vegetable oils, nuts and whole grains are the richest sources of vitamin E (e.g., Wheat germ oil). It is present in small quantities in lettuce, grasses and embryos of many seeds. In general, plant foods are richer sources of vitamin E than animal foods.
- **Deficiency:** Vitamin E deficiency has been associated with irritability, edema and haemolytic anaemia among infants. Also, Muscular dystrophy is common to all species in which there is degeneration of skeletal and cardiac muscle with vitamin E deficiency.

(d) Vitamin K

Vitamin K occurs in two forms.

- Phylloquinones (vitamin K1) - plant source and dietary form of vitamin K
- Menaquinone (vitamin K2) - synthesized by intestinal bacterial flora.

Food Sources:

The major dietary source of vitamin K is Phyllo Quinone which is present in high concentration in most vegetables like cabbage, spinach and cauliflower. Animal food sources include cheese, egg yolk, and liver.

Deficiency: It manifests in the form of defective blood clotting. Low levels of prothrombin and haemorrhage are seen in severe forms of deficiency.



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2.b. Water Soluble Vitamins

(a) Thiamine (B1):

Thiamine is the first member of the B complex vitamins which is essential to the body in its coenzyme form.

- **Food sources:** Good food sources include lean pork, beef, liver, whole or enriched grains and legumes.
- **Deficiency of thiamine:** The discovery of thiamine provided the answer to the puzzle of a nutritional problem called Beri Beri. The deficiency of thiamine causes Beri Beri in human beings. The Philippino word Beri Beri means "I Can't" refers to the lack of neuromotor coordination in persons with the disease.

Beri Beri is of two types: dry and wet type. In dry Beri Beri the muscles become progressively wasted, weak and walking becomes difficult. If not treated the patient becomes bedridden and will die. In wet Beri Beri edema is present which involves the face, trunk and serous cavities. Palpitation and breathlessness are present. The heart becomes weak and death occurs due to heart failure. Infantile Beri Beri is seen in many South East Asian countries where the diets consist mostly of "polished rice."

(b) Riboflavin (B2):

Riboflavin is a stable vitamin which is resistant to acid, heat and oxidation. But it is unstable in the presence of alkali and light. **Food sources:** Good sources of riboflavin are milk and milk products, eggs, liver, whole or enriched grains and green leafy vegetables.

Deficiency: The deficiency of riboflavin (ariboflavinosis) leads to glossitis (swollen and reddened tongue), swollen lips, cheilosis (inflammation of the corners of the mouth, are some of the common symptoms observed. Further deficiency states are marked by chronic conditions like tuberculosis, prolonged fevers, malabsorption, Hyperthyroidism and malignancy.

(c) Niacin:

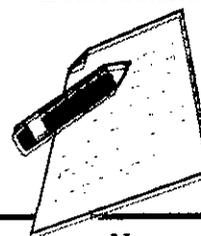
Niacin formerly known as nicotinic acid was obtained by the oxidation of nicotinic acid. Apart from the food sources, Niacin is also obtained from tryptophan (60mg) an essential amino acid which can be converted into niacin (1mg). **Food sources:** Whole cereals, pulses, nuts and meat are good sources of Niacin. Groundnut is rich in Niacin. Milk is rich in Tryptophan the precursor of Niacin in the body.

Deficiency: Deficiency of Niacin causes Pellagra which is the 3D (Dermatitis, diarrhoea, dementia or depression) disease leading to the fourth D (Death).

Consumption of diets rich in corn can create amino acid imbalance as corn is rich in leucine and deficient in tryptophan. The typical features of pellagra are loss of weight and increasing weakness. Non-specific signs like anorexia, nausea, digestive disturbances and emotional changes like anxiety, irritability and insomnia may be present.

(d) Pyridoxine (B6):

Pyridoxine exists in the body in three forms: Pyridoxal, Pyridoxine and Pyridoxamine. Pyridoxal 5 phosphate is the co-enzyme form of pyridoxine. **Food sources:** Good food sources include grains, seeds, liver, kidney and other meats.



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Deficiency: Clinical Symptoms of pyridoxine deficiency have not been clearly defined. Some types of angular stomatitis (cracking at the corners of the lips) and certain types of anaemia have been reported due to decreased intake of pyridoxine.

(e) Folic acid:

The term folic acid was coined to as it was first extracted from dark green leafy vegetables such as spinach.

- **Food sources:** The rich sources of folate are fish, mutton, liver, egg, chicken, green leafy vegetables and pulses.
- **Deficiency:** Deficiency of folic acid causes megaloblastic anaemia. Megaloblasts appear in bone marrow and peripheral blood. Poor dietary intake of folic acid, low absorption, increased losses, increased requirements, infestation, infection and drugs also cause folic acid deficiency. Symptoms include weakness, tiredness, dyspnoea, sore tongue, headache and palpitation. Folate deficiency during pregnancy can result in neural tube defects like spina bifida and anencephaly.

(f) Cyanocobalamin (B12):

The vitamin is named as cyanocobalamin because of the presence of cobalt and cyanide in its structure. It can be absorbed in the body only in the presence of Intrinsic Factor (IF). **Food sources:** Cyanocobalamin is synthesized by bacteria and is found in foods of animal origin. Liver is the richest source of cyanocobalamins. Meat, fish, kidney, brain and eggs are good sources of cyanocobalamin.

Deficiency: Inability to produce the intrinsic factor which binds cyanocobalamin leads to pernicious anaemia. The red blood cells are macrocytic and the count is often less than 2.5 million. Symptoms include soreness and inflammation of the tongue, paraesthesia (numbness and tingling) in fingers and toes, demyelination of the white fibres of the spinal cord and in severe cases degeneration of the spinal cord.

Other B complex vitamins include biotin, pantothenic acid which do have their vital functions as coenzymes in various biochemical functions of the body

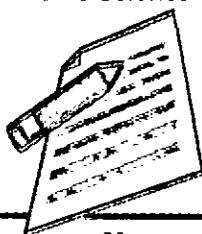
(g) Vitamin C (Ascorbic acid):

Ascorbic acid is the chemical name of vitamin C which can be synthesized from glucose but humans depend on their diet for vitamin C as they do not have an enzyme gluconolactone oxidase which catalyses the conversion reaction. **Food Sources:** Citrus fruits like orange, lemon, tomatoes, guava, watermelon are good sources of Vitamin C.

Deficiency: Scurvy the most severe form of vitamin C deficiency arises mainly due to faulty cooking habits and inadequate intake of fruits and vegetables. The clinical features of scurvy are characterized by gingivitis (bleeding gums) petechiae (small haemorrhagic spots), arthralgia (pain in the joint), depression, postural hypotension, delayed wound healing. Main deficiency symptoms in infants include tender bones, cessation of bone growth, anaemia and pyrexia.

WATER

Water: Water is defined as an essential nutrient because it is required in amounts that exceed the body's ability to produce it. All biochemical reactions occur in water. It fills the spaces in

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and between cells and helps form structures of large molecules such as protein and glycogen. In human adults' total body water accounts for about 70 per cent of the lean body mass.

Requirements: the requirement of water depends on person's age, weight and life style. Adults should consume 1 litre of water for every 1000kcal in their diet, infants should consume 1.5 litre/1000kcal.

Overall water balance: The average adult processes 2.5 litres to 3 litres of water each day.

Water enters the body in three forms:

Water taken in as water or in other beverages

Preformed water in food

Metabolic water produced by cell oxidation

Water leaves the body in the following ways via the

- Kidneys Skin
- Lungs Faeces
- **Water imbalance:** Water can be depleted in the body due to reduced intake caused by unavailability of water, inability to obtain water and swallow it. Increased losses of water are also experienced due to hot environment, hyperventilation, pro-longed vomiting and diarrhea, kidney disorders and diabetes insipidus.
- **Water deprivation:** Dehydration of body occurs when water is not taken in adequate amounts to make up for the water loss. It occurs in severe diarrhea and vomiting. Evidence of dehydration manifests in the form of sunken eyes, dry tongue, loose and inelastic skin. Simple water deprivation also causes loss of sodium and potassium. The subject should be given water, glucose and electrolytes to replenish his fluid levels.
- **Water Intoxication (water excess):** Over hydration occurs when large quantities of water are drunk in a hot climate or water excretion by the kidneys is impaired. Water Excess causes drowsiness, giddiness confusion headache, nausea, convulsions and coma.

Relationship between Food, Nutrients and Health

The connections between our foods, the nutrients they provide and our health are complex, but have far-reaching consequences for individuals and society. As changing diets and dietary habits place an increasing burden on healthcare systems, it is crucial that we develop new products, interventions and refined guidelines which will improve health through diet. Achieving this will depend upon a complete understanding of the biological processes which connect the foods we eat to our long-term health.

Nutrition plays a role in promoting good health. So, we have to be careful about the foods and nutrients which should be emphasized in our diets, and how they can enhance our health. Diets full of fruits and veggies, whole grains, nuts, and lean meats have proven health benefits like lowering blood pressure, improving glucose control in diabetics, weight loss, improving arthritis, and reducing the risk of cancer and cardiovascular events and so on.

We should also learn about the specific nutrients that can impact health. For example, **Plant pigments** found in bright orange and red fruits and vegetables, which may prevent and slow the progression of eye diseases.

Calcium helps to keep bones strong.

Vitamin B plays a role in maintaining brain health.

Flavonoids from many plants may improve the health of our cardiovascular systems.



Notes

It's not surprising that physical activity can help to maintain a healthy weight, improve mood and sleep habits, and boost overall health. And it's clear that a well-balanced diet, full of nutritious foods is crucial to good health.

Why Good Nutrition is Important for Health?

Good and balanced nutrition is very beneficial for us. Good nutrition means a portion of food that can maintain the required energy balance in our body. If we do not have the energy, we cannot perform well. For good and optimum health, we should be careful about what we are eating, how we are eating, how much we are eating, and what time we are eating.

We have a few limiting factors in our body and by consuming good nutrition we can remove them. Among the limiting factors which come first in our mind is Genetics.

We all have different genes and we have to accept that each and every one is not genetically blessed. For example, some people lose bodyweight very fast and some lose very slowly; some people get good muscles very fast but some are not. This is a genetic factor.

But if we add good nutrition to our food, it allows us to break up this fact and even we can achieve good health. That is why Nutrition is known as a Promoter of Good Health.

The importance of nutrition for health and society

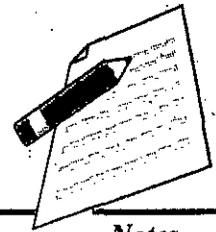
Eating a well-balanced diet, with adequate nutrients and appropriate calories, is a fundamental requirement for continued health. An appropriate diet contributes to healthy development, healthy ageing and greater resilience against disease. Similarly, a poor or inappropriate diet places people at greater risk of infection and a range of chronic illnesses – including cancer, type 2 diabetes and cardiovascular disease.

Despite the clear connections between nutrition and health, more than half of the UK population are obese or overweight, consumption of fruit and vegetables is falling and the calorie density of the average shopping basket is increasing. Meanwhile, around three million people in the UK are malnourished, including 25% of those in hospital and 42% in long-term care.

This represents a serious economic and social challenge. High body mass index is one of the leading risk factors for chronic disease in the UK, accounting for 9% (£5.1Bn per year) of NHS spend. The cost to the wider economy is vast at around £16Bn per year, rising to £50Bn by 2050 if action is not taken. As costs escalate, the need for new products and interventions to promote health through our diets is becoming ever more urgent.

SUMMARY

Food has been a necessity for human survival since the very beginning of the world. Food is required for every living creature. Good food is reflected by optimum health and wellbeing. In early times man ate food most naturally. Fruits, vegetables, cereals, pulses, fats, oils or sugars were all consumed as they were available without any refinement or processing. Later man discovered methods of cooking and also preserving food according to his need. By accident man discovered fire and then experimented and began to cook non-vegetarian foods like fish, meat etc. by direct roasting on fire. This was followed by salting food and dehydration of foods as preservation techniques. The connections between our foods, the nutrients they provide and our health are complex, but have far-reaching consequences for individuals and society. As changing diets and dietary habits place an increasing burden on healthcare systems,



8. Which of the following cannot be a part of a vegan diet?

- 1) eggs
- 2) fish
- 3) milk
- 4) vegetables

- a) 1 and 2
- b) 1, 2 and 3
- c) Only 2
- d) All of the above

Answer (b).

9. Which of the following is not an artificial sweetener?

- a) saccharin
- b) aspartame
- c) sucrose
- d) neotame

Answer (c).

10. Which of the following food constituents is not digested but is still important for us?

- a) vitamins
- b) minerals
- c) proteins
- d) fibre

Answer (d).

Review Questions

1. Define food?
2. Define Nutrients?
3. What are micronutrients?
4. What are macronutrients?
5. Discuss the relationship between food, health and nutrients?
6. Explain the sources of nutrients?
7. Discuss in details the deficiency of nutrients?



Notes

5

MEAL PLANNING

Meal Planning:- food Groups, Balance Diet, meal planning, factors influencing meal planning, planning balanced meal for the family, definition, need and types of therapeutic diet, diet in common diseases.

- Understand the concept of food groups.
- Understand the concept of Balance Diet.
- Discuss the factors influencing meal planning.
- Describe the definition, need and types of therapeutic diet.
- Discuss the concept of meal planning.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of food groups, meal planning and balanced diet so that the relationship between meal planning and balanced diet can be learned.

Meal Planning

Introduction

Basic four food groups and its significance

Food groups have been classified according to various methods from time to time. ICMR (2011) has classified the different foods items into four food groups as listed in Table 1. They are

- Cereal, millets and pulses
- Milk, and animal products
- Fruits and vegetables
- Fats, oils and nuts

Table 1 Basic Four Food Groups

Food Groups	Main Nutrient
1 Cereal millets and pulses: Rice, Wheat, Ragi, Bajra, Maize, Rice flakes	Energy, Protein, invisible fats, Vit B1, B2, Folic acid, iron, fibre
Pulses and legumes : Bengal gram, black gram, green gram, red gram, rajmah	Energy, proteins, Invisible fats, Vit B1, B2, folic acid, calcium, iron fibre



Notes

2	Milk and Animal products: milk, curd, Skimmed milk, Cheese, Chicken, Liver, Fish, Egg, Meat	Protein, Fat, Vit B2, Calcium
3	Fruits and vegetables : Mango, Guava, tomato, Papaya, Orange, etc Green leafy vegetables: Amaranth, spinach, coriander leaves, fenugreek leaves, Drumstick leaves Other vegetables: carrot, Brinjal, beans, Onions, etc	Carotenoids, Vitamin C, Vit B2, Iron, folic acid, fibre Carotenoids, vitamin B2, folic acid, fibre Carotenoids, folic acid, calcium
4	Oils, Fats and nuts Fats, Butter, ghee, hydrogenated fat, cooking oil like groundnut, mustard, sunflower sugar, jaggery, Sugar, Cane Almonds, walnuts, and gingelly seeds	Energy, Fat, essential fatty acid Energy Protein, Omega 3 fatty acid

Significance of the Four-Food Group System

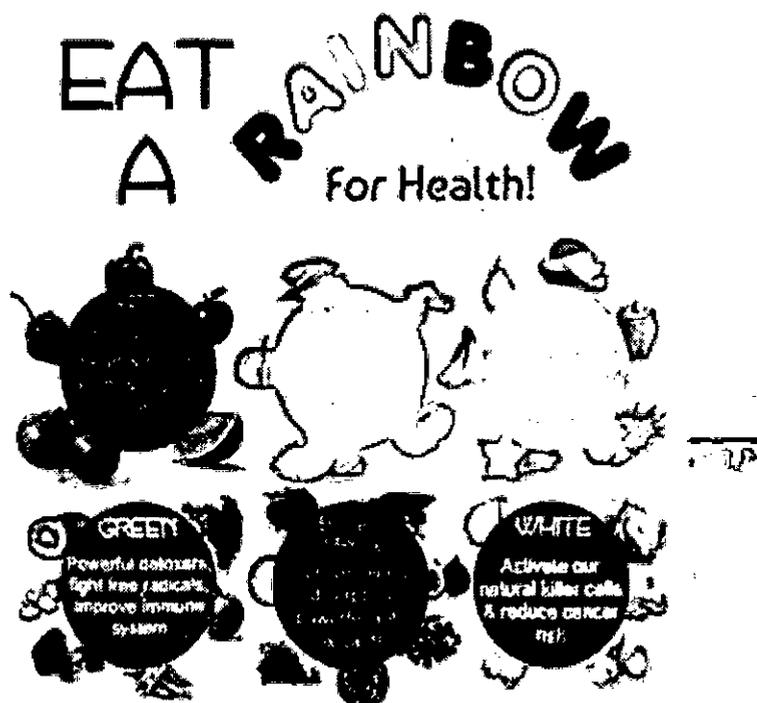
The four food group system can be used for the following purposes:

- i. Planning wholesome balanced menus to achieve nutritional adequacy.
- ii. Assessing nutritional status – a brief diet history of an individual can disclose inadequacies of food and nutrients from any of the four groups.

Based on the assessment, nutrition education can be imparted to the individual.

The quantity of the meals can be improved or is said to be optimum when the diets are complete. Every meal should have foods providing energy, protein, vitamins and minerals fibre and adequate amount of water

Colourful rainbow of fruits and vegetables presents you with following health benefits.





Notes

Millets

Millets are small – seeded grasses that are hard and grow well in dry zones as rain-fed crops under marginal conditions of soil fertility and moisture. Millets are one of the oldest foods known to humans and possibly the first cereal grains to be used for domestic purposes. They are highly nutritious, gluten free. Hence, they are soothing and easy to digest. They are considered to be the least allergic and most digestible grains available. Compared to rice, polished rice, millets release lesser percentage of glucose and over a longer period of time this lowers the risk of diabetes.

<p>HELPS TO PREVENT HEART DISEASES</p> <p>LOWERS BAD CHOLESTEROL LEVELS</p> <p>USEFUL IN DETOXIFYING BODY</p> <p>PREVENTS TYPE 2 DIABETES</p> <p>PREVENTS ONSET OF BREAST CANCER</p> <p>EFFECTIVE IN REDUCING BLOOD PRESSURE</p> <p>HELPS TO OPTIMIZE KIDNEY, LIVER AND IMMUNE SYSTEM HEALTH</p>	   
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Types and Importance of Millets

Millets are particularly high in minerals like iron, magnesium, phosphorous and potassium, finger millet (ragi) is richest in calcium content.

Kinds of millets:

1. Barnyard Millet – Kuthiravali
2. Finger Millet – Ragi
3. Foxtail Millet – Thinai
4. Kodon Millet – Varagu
5. Little Millet – Samai
6. Pearl Millet – Kambu
7. Proso Millet – Panivaragu
8. Sorghum – Cholam

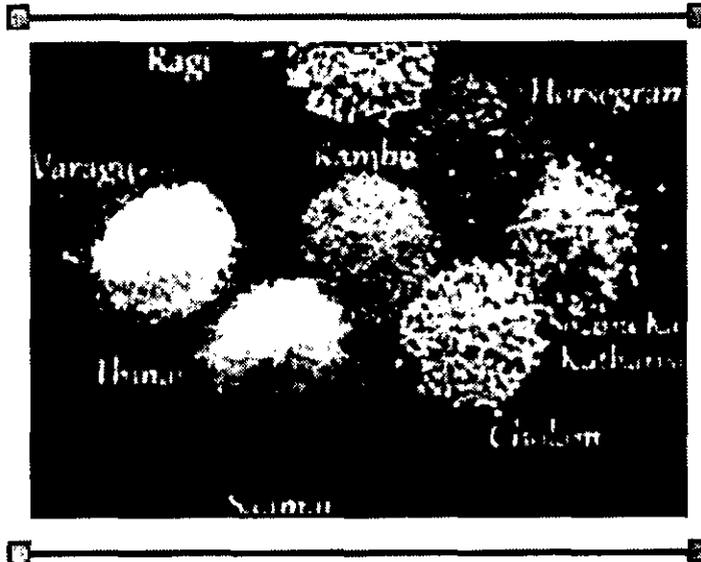
Millets can be incorporated in our daily diet for almost all the meals and dishes. Breakfast items like porridge, dosa, idli, uppuma, puttu, ragi kali, -doughnuts, vadas, bonda, chapathis, pooris etc are some of the commonly prepared items.



Notes

Main meal items like ragi kali are highly nutritious.

Millets can also lend themselves to the baking of cakes and biscuits as a 20% to 50% level of the cereal flour is being used and therefore enhance the nutritive value of the product. The nutritional content of millets is given in Table 2.



Millet	Iron (in mg)	Calcium (in mg)	Minerals (in g)	Fibre (in g)	Protein (in g)
Pearl millet	16.9	38	2.3	1.3	10.6
Finger millet	3.9	344	2.7	3.6	7.3
Foxtail millet	2.8	31	3.3	8.0	12.3
Proso millet	0.8	14	1.9	2.2	12.5
Kodo millet	0.5	27	2.6	9	8.3
Little millet	9.3	17	1.5	7.6	7.7
Barnyard millet	15.2	11	4.4	10.1	11.2

Source: Millet Network of India

Food pyramid

Food pyramid is a visual tool that is used as a guide in designing diet. It is developed as a guide to provide a frame work for the types and amounts of food that can be eaten in combination to provide a healthy diet.

The Indian adaption of the food pyramid is divided into four levels of food according to recommended consumption.

1. Cereals, legumes / beans, dairy products at the base should be eaten in sufficient quantity.
2. Vegetables and fruits on the second level should be eaten liberally.
3. Animal source foods and oils on the third level to be eaten moderately
4. At the apex highly processed foods that are high in sugar and fat are to be eaten sparingly.



Notes



▲ Fig 2 Food Pyramid

One peculiarity of the Indian adaptation of the food pyramid is the recommendation to do regular physical activity. The pyramid provides information on the food types and amount necessary to meet daily dietary requirements. Each food group is represented by a band or level. Narrow bands at the apex indicate lower quantities, while wider bands at the base means that more from that food group needs to be consumed.

Most important is to include 2 to 3 litre of water each day as it's the most important nutrient of all, accounting for 70% of our body weight and also helping in the upkeep of our health.

It is very important that an individual incorporates the principles of good nutrition such as variety, a balanced intake of nutrients and moderation. The best way to meet the daily requirements is to eat a diet that combines cereals, fruits, vegetables, meat, fish, poultry legumes and dairy products. Eating a variety of foods daily as guided by the "Food Pyramid" will help to provide all the nutrients needed by the body.

In recent times, food has emerged as a source of comfort and a potential threat to health. It reflects cultural heritage and gives a feeling of security and pleasure. Healthy food intake is an important part of life. Hence, it is very essential to gain knowledge about food, its planning, preparation and service. Creative meal management for people at different age groups can add pleasure and satisfaction to their lives and ensure healthy living.

Balanced Diet

A balanced diet is one which provides all the nutrients in required amounts and proper proportions so that the need for calories, proteins, minerals, vitamins and other nutrients are adequately met. It can be easily achieved through a blend of four basic food groups. The nutrient requirements vary with age, gender, physiological status and physical activity. A balanced diet provides (i) 50-60% of total calories from carbohydrates, (ii) about 10-15% from proteins (iii) and 20-30% from both visible and invisible fat. In addition, a balanced diet should provide other non-nutrients such as dietary fiber, antioxidants and phytochemicals.



Notes

Recommended Dietary Allowance (RDA)

The Recommended Dietary Allowances (RDA) presented are in estimates of nutrients to be consumed daily to ensure that the requirements of all individuals in a given population are met. The recommended levels depend upon the bio availability of nutrients from a given diet. The term bio availability indicates what is absorbed and utilised by the body. In addition, RDA includes a margin of safety, to cover variation between individuals, dietary traditions and practices. The RDAs are suggested for all age groups such as infants, pre-schoolers, children, adolescents, pregnant women, lactating mothers and adult men and women taking into account their physical activity.

Factors Influencing Meal Planning

The RDA of an individual depends upon various factors which are as follows:

Age: Adults require more total calories than a child, whereas a growing child requires more calories per kg of body weight than an adult.

Sex: Males with high Basal Metabolic Rate (BMR) require more calories than females.

Activity: The type of activity also determines the energy requirements. The activities are classified as sedentary, moderate and heavy based on the occupation of an individual as given in the table 1 below

Physiological stress: Nutrient requirements are increased in conditions of physiological stress such as pregnancy and lactation.

Table 1. Classification of Activity

Sex	Activity		
	Sedentary	Moderate	Heavy
Male	Teacher, Tailor, Barber, Executive, Peon	Fisher man, Basketmaker, Potter, Goldsmith	Stone cutter, Mineworker, Wood cutter
Female	Teacher, Tailor, Executive	House wife, Nurse, Servant maid	Wood cutter

Source: Gopalan C, Sastri B.V, & Balasubramanian S.C (2007)

Planning Balanced Diets for the family

Menu planning is the process of planning and scheduling intake of meals for general or specific individual requirements. The four food groups suggested by ICMR given in unit-III (Food Science), permits an individual to plan a menu to achieve nutrient intake as specified by recommended dietary allowances. There are certain principles in planning menus. They are:

- A good menu plan should meet the nutritional requirements of each member of the family.
- Meal pattern must fulfil family needs.
- Meal planning should save time and energy.
- Meal planning should satisfy the bud-get of the family.
- Meal plan should give maximum nutrients.



Notes

- The meal planned should consider individual likes and dislikes.
- Planned meals should provide variety.
- Meals should give satiety.
- Menus should include available foods.

There are three steps involved in planning a menu

Step 1: Recommended dietary allowance:

To plan a balanced diet the first step is to know the recommended dietary allowances for different age groups. The Recommended Dietary Allowance for Indians ICMR (2010) is given in the Table 2.

Group	Particulars	Body wt. kg	Net Energy Kcal/day	Protein g/day	Visible Fat g/day	Calcium mg/day	Iron mg/day
Man	Sedentary work		2320		25		
	Moderate work	60	2730	60	30	600	17
	Heavy work		3490		40		
Women	Sedentary work		1900		20		
	Moderate work		2230	55	25	600	21
	Heavy work		2850		30		
	Pregnant Women	55	+350	82.2	30	1200	35
	Lactation		+600	77.9	30	1200	25
Infants	0 - 6 months	5.4	92 Kcal/kg/d	1.16 g/kg/d	-	500	46 µg/kg/day
	6 - 12 months	8.4	80 Kcal/kg/d	1.69 g/kg/d	19		5
	1 - 3 years	12.9	1060	16.7	27		09
Children	4 - 6 years	18	1350	20.1	25	600	13
	7 - 9 years	25.1	1690	29.5	30		16
Boys	10 - 12 years	34.3	2190	39.9	35	800	21
Girls	10 - 12 years	35.0	2010	40.4	35	800	27
Boys	13 - 15 years	47.6	2750	54.3	45	800	32
Girls	13 - 15 years	46.6	2330	51.9	40	800	27
Boys	16 - 17 years	55.4	3020	61.5	50	800	28
Girls	16 - 17 years	52.1	2440	55.5	35	800	26

Source: Dietary guidelines of Indians National Institute of Nutrition, Hyderabad, (2010).

Step 2: Food list

Food list is the list of quantities of various food groups to be included in the diet so that it is balanced and can meet the RDA. This can be done by:

- Selecting food from all the four food groups.
- Deciding the quantities of the selected as multiples of portion sizes.
- Food list can be prepared either by using ICMR tables or exchange lists.



i. Using ICMR tables

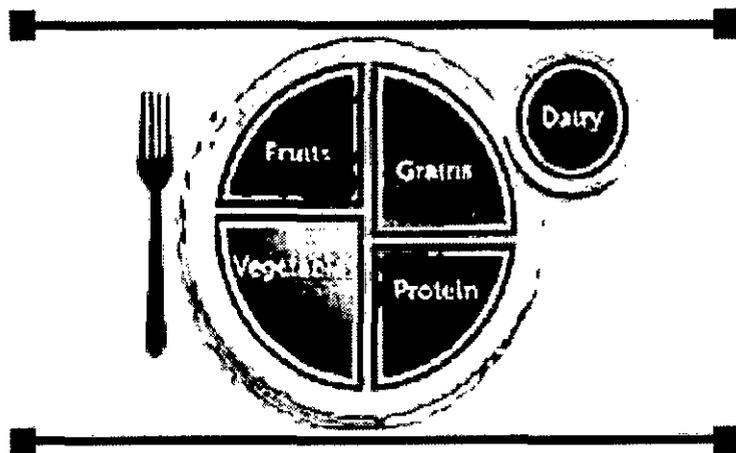
To make menu planning more convenient ICMR has suggested the portion size and balanced diets for adults and for different age groups. The portion sizes are given in terms of raw food.

ii. The Exchange Lists

The Exchange Lists are the basis of a meal planning. Food exchange lists are groups of measured foods of the same calorific value and similar protein, fat and carbohydrate content. All foods of exchange lists make a specific contribution to a good diet. Food exchange lists help in manipulation of protein, calories and other nutrients.

Step 3: Meal plan

The foods that are listed are converted into recipes and distributed in various meals like breakfast, lunch and dinner. My Plate helps individuals to make better food choices and eat healthfully. It illustrates the food groups using a familiar mealtime visual.



▲ Fig 1 My Plate

Table 3 Portion Size And Nutrient Content

Food Groups	Portion G	Energy Kcal	Protein g	Carbohydrate g	Fat g
Cereals and millets	30	100	3.0	20	0.8
Pulses	30	100	6.0	15	0.7
Egg	50	85	7.0	-	7.0
Meat/chicken or fish	100	100	9	-	7.0
Milk(ml) and milk product	100	70	3.0	5	3.0
Roots and tubers	100	80	1.3	19	-
Green leafy vegetables	100	45	3.6	-	0.4
Other vegetables	100	30	1.7	-	0.2
Fruits	100	40	-	10	-
Sugars	5	20	-	5	-
Fats and oils	5	45	-	-	5

Source: Dietary guidelines for Indians, National Institute of Nutrition, Hyderabad, (2011).



Table 5 Sample Meal Plan for Adult Man (Sedentary)

Meal time	Food group	Raw	Cooked recipe	Serving amounts
Breakfast	Milk	100ml	Milk or	½ cup
			Tea or	2 cups
	Sugar	15g	Coffee	1 cup
	Cereals	70g	Breakfast Item	
Lunch	Pulses	20g		
	Cereals	120g	Rice	2 cups
			Pulkas	2 no's
	Pulses	20g	Dhal	½ cup
	Vegetables	150g	Veg-curry	¾ cup
Tea	Milk	100ml	Curd	½ cup
	Cereals	50g	Snack	
	Milk	50ml	Tea	1 cup
	Sugar	10g		
Dinner	Cereals	120g	Rice	2cup
	Pulses	20g	Pulkas	2nos
	Vegetables	150g	Dhal	½ cup
	Milk(curd)	50ml	Vegetables	¾ cup
	Vegetables	50g		
	Fruit	100g	Seasonal	1 medium

Source: Dietary guidelines of Indians, National Institute of Nutrition, Hyderabad, (2010).

Therapeutic Diet

Definition:-A therapeutic diet is a meal plan that controls the intake of certain foods or nutrients. It is part of the treatment of a medical condition and are normally prescribed by a physician and planned by a dietician. A therapeutic diet is usually a modification of a regular diet. It is modified or tailored to fit the nutrition needs of a particular person. Therapeutic diets are modified for (1) nutrients, (2) texture, and/or (3) food allergies or food intolerances.

Need:- Therapeutic diets are formulated to optimize the nutritional needs of the client in order to treat a variety of diseases and disorders or to improve the eating capabilities of a patient or client. A diet ordered by a physician is part of treatment plan for a disease or clinical condition, to eliminate, decrease, or increase specific nutritional needs in the diet and to reduce the risk of injury.

Therapeutic diets are also used by dietitians to either maintain a healthy lifestyle or improve health. For instance, many dialysis patients are on diets that are therapeutic to their treatments so that there is maximum improvement from the dialysis treatment.

Some conditions that can benefit from a therapeutic diet include cardiovascular disease such as coronary artery disease, hypertension, heart attacks, and stroke. Diabetics can benefit from a therapeutic diet as can people with gastrointestinal diseases such as Crohn's disease, ulcerative colitis and celiac disease. Food allergies are also managed by restrictive dietary management. With dietary management, safety and injury concerns are also a factor. The ability to swallow may affect the choice of diet consistency that must be followed. Many therapeutic diets that are recommended for those with swallowing disorders may be chopped, pureed, or thickened liquids to decrease the risks choking.

There are a number of different reasons why an individual would have problems swallowing or dysphagia. There are numerous muscles and nerves that are required to swallow



food and many diseases or physiological conditions that may influence whether a person is able to swallow or not. Some of the most common disorders that affect swallowing include: neurological disorders, neurological damage, cancer and cancer treatment, Alzheimer's disease, and aging.

The increasing number of people that reside in long-term care facilities or nursing homes brings increasing awareness of disease management and safety through diet. Choking incidents are frequent in care facilities due to the numbers of residents that are affected by disorders that inhibit swallowing. It is imperative that all staff have knowledge of each person's ordered diet, the safety reasons of strictly following the prescribed diet and the skills to monitor closely residents that have been placed on dietary restrictions to reduce choking risks and manage disease. There are a number of different reasons why an individual would have problems swallowing or dysphagia.

Types:- Common reasons therapeutic diets may be ordered:

- To maintain nutritional status
- To restore nutritional status
- To correct nutritional status
- To decrease calories for weight control
- To provide extra calories for weight gain
- To balance amounts of carbohydrates, fat and protein for control of diabetes
- To provide a greater amount of a nutrient such as protein
- To decrease the amount of a nutrient such as sodium
- To exclude foods due to allergies or food intolerance
- To provide texture modifications due to problems with chewing and/or swallowing

Common therapeutic diets include:

1. Nutrient modifications
 - No concentrated sweets diet
 - Diabetic diets
 - No added salt diets
 - Low sodium diet
 - Low fat diet and/or low cholesterol diet
 - High fiber diet
 - Renal diet
2. Texture modification
 - Mechanical soft diet
 - Puree diet
3. Food allergy or food intolerance modification
 - Food allergy
 - Food intolerance
4. Tube feedings
 - Liquid tube feedings in place of meals
 - Liquid tube feedings in addition to meals



Notes

5. Additional feedings – In addition to meal, extra nutrition may be ordered as:
 - Supplements – usually ordered as liquid nutritional shakes once, twice or three times per day; given either with meals or between meals
 - Nourishments – ordered as a snack food or beverage items to be given between meals mid-morning and/or mid-afternoon
 - HS snack – ordered as a snack food or beverage items to be given at the hour of sleep

Diet in Common Diseases:- It's undeniable that a well-balanced diet goes hand in hand with a healthy lifestyle. What you choose to eat, and what you choose not to eat, are factors in warding off many leading chronic illnesses and diseases. Food choices make a huge impact on how you feel today, tomorrow and what the future holds in terms of promoting and maintaining good health. The right diet can help fight conditions and illnesses like heart disease, diabetes, osteoporosis, cancer and obesity among many others.

Obesity: The scary truth is that obesity is becoming very prevalent in adolescents. Dietary habits that are established in childhood more often than not carry over into adulthood. This is why it's critical to instil good diet and nutrition practices in today's youth. Making sure children have the correct amount of nutrients and foods from major food groups is key to preventing obesity.

Heart Disease: Keeping blood pressure, cholesterol and weight under control are main components to preventing heart disease. Healthy eating habits are a way to keep these numbers balanced. Focusing a diet on whole grains, fruits, veggies, and proteins, as well as limiting sodium and foods that are high in calories are good rules of thumb.

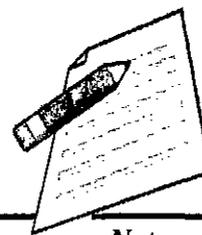
Diabetes: The best way to prevent type 2 diabetes is to eat a low-fat, well-balanced diet. Other diet tips include decreasing fat consumption to less than 30 percent of calories and saturated fat consumption to less than 10 percent of calories. Adding high-fiber foods to a diet regimen is also important to preventing this lifelong condition.

Cancer: Obesity increases the odds of developing cancer, and luckily there are many foods that can aide in prevention. Leafy greens, cruciferous vegetables, berries, whole grains and even green and black tea all help protect against various types of cancer. While no single food is a sure way to prevent cancer, the appropriate combination of vitamins and minerals along with a well-balanced diet can provide solid protection.

Osteoporosis: A diet lacking vitamin D and calcium can contribute to osteoporosis. In order to keep bones healthy and strong, a diet containing specific types of foods is recommended. This includes low fat versions of foods that are high in calcium, and those fortified with vitamin D. Calcium fortified products, like orange juice, cereals and soy-based foods are a good way to increase calcium in a diet.

SUMMARY

A balanced diet is one which provides all the nutrients in required amounts and proper proportions so that the need for calories, proteins, minerals, vitamins and other nutrients are adequately met. It can be easily achieved through a blend of four basic food groups. The nutrient requirements vary with age, gender, physiological status and physical activity. A balanced diet provides (i) 50-60% of total calories from carbohydrates, (ii) about 10-15% from proteins (iii) and 20-30% from both visible and invisible fat. In addition, a balanced diet should provide other non-nutrients such as dietary fiber, antioxidants and phytochemicals. Menu planning is the process of planning and scheduling intake of meals for general or



specific individual requirements. The four food groups suggested by ICMR given in unit-III (Food Science), permits an individual to plan a menu to achieve nutrient intake as specified by recommended dietary allowances. It's undeniable that a well-balanced diet goes hand in hand with a healthy lifestyle. What you choose to eat, and what you choose not to eat, are factors in warding off many leading chronic illnesses and diseases. Food choices make a huge impact on how you feel today, tomorrow and what the future holds in terms of promoting and maintaining good health. The right diet can help fight conditions and illnesses like heart disease, diabetes, osteoporosis, cancer and obesity among many others.

EXERCISE

Multiple Choice Questions

Tick mark (✓) the most appropriate answer:

- (1) A balanced diet should consist of
 - a) both plant and animal foods
 - b) only plant foods
 - c) only animal foods
 - d) only cereals and pulses
- (2) A balanced diet is one which has
 - a) some nutrient in referred amount
 - b) food from one food group in correct amounts
 - c) all the nutrients in correct amounts
 - d) all those foods that a person likes to eat in correct amounts
3. Write 'T' against true and 'F' against false statements. Justify your answer.
 - (i) Sick people need only medicines for improving health.
 - (ii) Diet plays no role in helping the patient to get well.
 - (iii) Liquid diet consists of foods like nimbupani, fruit juices, coconut water, etc.
 - (iv) The normal diet meets nutritional needs of all sick individuals.
 - (v) The modified diet should be as similar to the normal diet as possible.
4. The Food Guide Pyramid should not be used to plan meals.
 - A. True
 - B. False
5. Meals should be planned to have a variety of shapes, textures, colours, flavours and temperatures.
 - A. True
 - B. False
6. Storing dry goods (flour, cornmeal) in air-tight containers prolongs their shelf life.
 - A. True
 - B. False
7. Vitamins and minerals are macronutrients.
 - A. True
 - B. False
8. Balance, variety and moderation are important menu planning concepts.
 - A. True
 - B. False

Answers:-

1. a
2. c

CLASS-12

Home Science

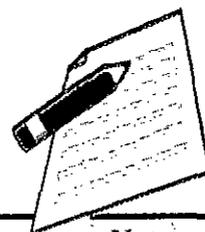


Notes

3. (i) False, nutritive diet builds the body's ability to fight sickness.
(ii) False, diet facilitates recovery.
(iii) True, as these are high in water content.
(iv) False, diet have to be adjusted according to the sickness.
(v) True, as they have better acceptance.
4. False
5. True
6. True
7. False
8. True

Review Questions

1. What is food pyramid?
2. What is balanced diet?
3. What is meal planning?
4. Explain food groups in detail?
5. What is therapeutic diet?
6. Explain the factors influencing meal planning?
7. Explain the need and types of therapeutic diet?



Notes

6 NUTRITIONAL STATUS

Nutritional Status:- Definition, assessing nutritional status, causes and prevention of malnutrition, recognizing deficiency disorders: Vitamin A, Iron and Iodine, causes and prevention of the above deficiency disorder.

- Understand the concept of Nutritional Status.
- Understand the causes and prevention of malnutrition.
- Recognizing deficiency disorders: Vitamin A, Iron and Iodine.
- Describe the Definition and assessment of nutritional status.
- Discuss the causes and prevention of deficiency disorder.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of nutritional status so that the causes and prevention of mal nutrition can be learned.

Nutritional Status

Introduction

The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status. You know that we need a nutritious diet for our well-being and good health. When our body receives all the nutrients in appropriate amounts so as to meet the needs of the body, then we are in the state of good nutrition. We have a normal nutritional status. However, when the nutrients provided in the diet are inadequate or not utilised properly, it results in a state of imbalance in the body. If this continues for some time it may develop into a severe problem which may even prove fatal.

When there is a lack of excess intake of one or more nutrients and/or faulty utilisation of nutrients in our body, it leads to the state of imbalance in the body. This condition is known as malnutrition.

There are two types of malnutrition. The condition of health of a person that results due to the lack of one or more nutrients is called under nutrition.

However, when there is an excess intake of nutrients, it results in over nutrition. Thus, the condition of malnutrition covers both the states of under nutrition and over nutrition. You must have seen people who eat energy rich foods in amounts more than what is required by their bodies become fat/obese. This is the result of over nutrition. This state of being obese is harmful as it may lead to serious health problems. But under nutrition is more common around us. In fact, malnutrition has become a synonym of 'under.



Assessing Nutritional Status

Nutritional assessment is the systematic process of collecting and interpreting information in order to make decisions about the nature and cause of nutrition related health issues that affect an individual.

This differs from nutritional screening (link to Screening and MUST page) which is a brief risk assessment which can be carried out by any healthcare professional and which may lead to a nutritional assessment by a dietician.

Following a structured assessment path enables health professionals to carry out a quality nutritional assessment in order to identify those who need nutritional intervention, and to improve clinical decision making using a person-centred approach. The process promotes consistent quality of practice; is user friendly; and allows effective monitoring of patients. A structured assessment pathway does not remove autonomy; it encourages professional judgement and informed decision making at every stage. The process provides a rationale for the nutritional intervention, and allows for revision of the plan as individual circumstances change over time.

Assessment

A: Anthropometry

Anthropometry allows for an assessment of the different component parts of the human body. Body composition refers to the anatomical makeup of the body in terms of bone, muscle, water and fat. A single measure will not provide a comprehensive overview of the patients' condition and so a number of measurements are required to form a more reasoned assessment. In malnutrition, changes in body composition led to Introduction to Malnutrition.

Anthropometric measurements that can be used to assess body composition.

Measurement	Equation/ method	Interpretation of results
Weight and % weight change	$\% \text{ weight change} = (\text{current weight} - \text{previous weight} / \text{current weight}) \times 100$	A patient is indicated for nutrition support if they have: BMI <18.5kg/m ² Unintentional weight loss of >10% in the previous 3-6 months BMI <20kg/m ² and unintentional weight loss >5% in the previous 3-6 months. (NICE, 2006)
Body mass index (BMI)	$\text{BMI (kg/m}^2\text{)} = \text{weight (kg)} / \text{height}^2\text{(m}^2\text{)}$	If BMI <18.5kg/m ² patient is underweight If BMI 18.5-25kg/m ² patient is in normal BMI range If BMI >25kg/m ² patient is overweight (WHO, 2016)



Notes

<p>Mid upper arm circumference (MUAC)</p>	<p>Involves measuring the circumference of the mid-point on upper arm using a tape measure. This is a surrogate measure of both fat mass and fat free mass. It is a useful measure when a person cannot be weighed or if their weight is not likely to be a true reflection of the persons' actual weight, e.g., if the patient has oedema or ascites.</p>	<p>If MUAC is >23.5cm the patient is likely to have a healthy BMI and is at low risk of malnutrition. If MUAC is <23.5cm the patient is likely to have a BMI <20kg/m² and may be at risk of malnutrition. (BAPEN, 2011)</p>
<p>Skin fold thickness</p>	<p>Measurement requires a trained person using skin fold callipers which have been calibrated. Skin fold measurements can be taken at 4 different sites: suprailliac, subscapular, biceps, triceps (TSF; most commonly used). Measurement should be repeated 3 times and the mean result recorded. This is a surrogate measure of total fat mass. Longitudinal measurements can be used to identify any changes in fat mass.</p>	<p>Centile tables can be used to interpret skin fold thickness measurements.</p>
<p>Mid arm muscle circumference (MAMC)</p>	<p>MAMC is a surrogate measure of fat free mass and is calculated using MUAC and TSF. MAMC (cm) = MUAC (cm) – 3.14 x TSF (cm)</p>	<p>Centile tables allow assessment of changes in total body muscle mass over time.</p>

Other visual signs may indicate recent weight loss such as loose jewellery, baggy clothes, extra notch in belt, ill-fitting dentures, lose or thin looking skin, and prominent bony features.

B Biochemistry

The blood tests conducted within a nutrition assessment are interpreted in conjunction with a clinical examination; previous medical history; and current medications. Biochemistry tests measure levels of chemical substances present in the blood. Functional tests measure the function of vital organs such as the kidneys or liver.

CLASS-12
Home Science

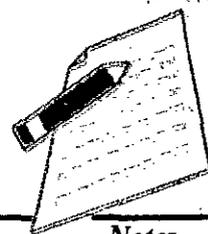


Notes

Measurement	Rationale	Normal range (note that different laboratories may use different reference ranges)
Haemoglobin (Hb)	Assess for iron status or indicate anaemia.	Women = 12.0 to 15.5 g/dl Men = 13.5 to 17.5 g/dl
Albumin (Alb)	A low level may indicate inflammation or infection is present, therefore should not be used to determine nutritional status.	35 - 50 g/L (3.5 - 5.0 g/dL)
C-Reactive Protein (CRP)	This is an inflammatory marker which is raised when infection or inflammation is present.	Ideally <10 mg/L
White cell count (WCC)	Immune system marker; is raised if infection is present.	4-11 x10 ⁹ /L (4000-11,000 per cubic millimetre of blood)
Glycated Haemoglobin (HbA1c)	Indicates an average blood sugar level over a period of months.	Ideally <48 mmol/mol or <6.5% (Diabetes UK)
Sodium (Na)	This is an indication of hydration status and kidney function. A raised sodium level may indicate dehydration.	135-145 mmol/L
Urea (Ur)	Used to assess kidney function. High urea and other markers levels in combination may indicate dehydration.	2.5-7.1 mmol/L
Calcium and Phosphate	Used as a baseline when assessing risk of refeeding syndrome Calcium is adjusted for albumin level	Adjusted Ca 2.0-2.6 mmol/l Phosphate 0.7-1.4 mmol/l
Magnesium	Likely to be low if there are large GI losses	0.7-1.0 mmol/l
Micronutrients	Include vitamins and trace elements. These are affected by the acute phase response if inflammation or infection is present and so best measured when CRP is low	

C Clinical

A person's disease state may increase the risk of malnutrition due to increased energy requirements; reduced energy intake; or increased nutritional losses. Examples of diseases/



conditions where this may occur include:

Cancer

Chronic Obstructive Pulmonary Disease

Heart failure

Gastrointestinal disorders such as Crohns disease, liver disease, coeliac disease

Neurological conditions such as stroke, Motor Neurone Disease, Parkinson's Disease, multiple sclerosis, dementia

Burns, surgery or trauma

Mental health conditions (such as depression)

Symptoms that may impact on a person's nutritional status either through reducing nutritional intake or increasing nutritional losses include:

altered bowel movements e.g., diarrhoea, constipation

upper gastrointestinal upset e.g., reflux, bloating, nausea, and vomiting.

early satiety

dysphagia

lethargy

D Dietary

Energy requirements

Estimate Basal Metabolic Rate (BMR) using Henry Equations (2005) based on age, gender and weight (Henry, 2005) or estimate requirements for stable patients using 25-35kcal/kg (NICE 2006).

Add factor when patient is metabolically stressed

Add factor for activity and diet induced thermogenesis

If aiming for weight gain, add 400-600 kcal/day. Only add this for patients who are metabolically stable (i.e., not acutely unwell).

There are a number of alternative methods to calculate energy requirements in patients who are obese, with care required not to over-estimate requirements.

Fluid requirements:

Aged >60 years = 30ml/kg body weight

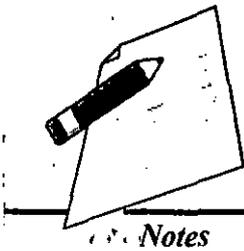
Aged <60 years = 35ml/kg body weight

Dietary assessment:

An estimation of the total daily calorie intake, as well as overall quality of diet should be assessed. Asking the patient (or their family/carer if patient unable) about their daily dietary intake will help understand patterns of eating, portion sizes, cooking methods and types of food and drink taken. Consider asking the following questions to help form a better understanding of the patients' overall diet:

What are the patients' typical food and fluid intake? This can be recorded using food record charts; 24-hour recall; 3-day food diary; or typical day diet history.

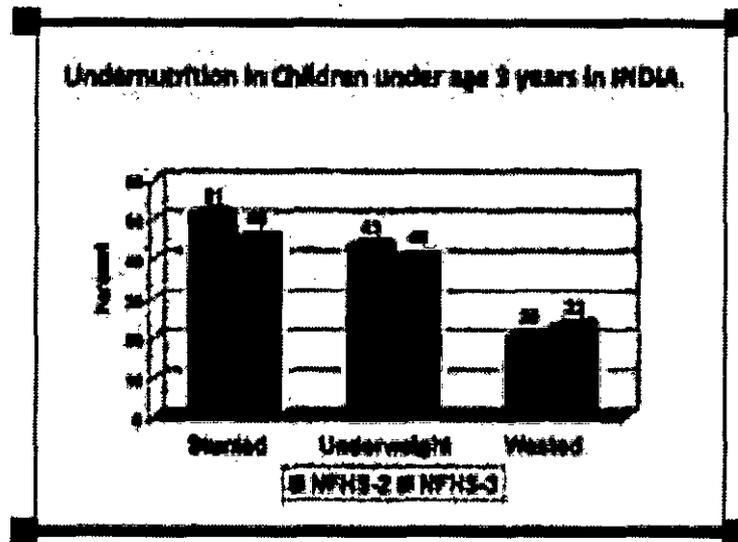
Is the patient eating 3 meals a day?



- Do they have pudding after at least one meal per day?
- Are they eating snacks in between meals?
- Are they eating smaller meals than they used to when they were feeling well?
- Are they having regular drinks, at least 6-8 glasses of fluid/ day?
- Are they having nutritious drinks such as milky tea/coffee, fruit juice, milky drinks?
- Are they having carbohydrate foods (bread, potatoes, pasta, rice, breakfast cereals etc) and protein foods (meat, cheese, beans, egg, fish, milk, yoghurt, cream) at each meal time?
- Portion sizes should be at least the size of the patient's fist and amount to 1/3 each on the plate (carbohydrate, protein, vegetables).
- Are they eating at least one portion of fruit or vegetable each day?
- If food is being blended, are they adding nutritious liquids such as milk, cream or gravy to aid blending, rather than water?
- Are they able to cook for themselves?
- Do they have access to essentials such as bread, milk and cheese on a daily basis?
- Do they have a hot/cooked meal each day?
- Are they taking any nutritional supplements? Do they take them as recommended? Do they like them?

Malnutrition

WHO defines Malnutrition as “the cellular imbalance between the supply of nutrients and energy and the body’s demand for them to ensure growth, maintenance and specific functions”?

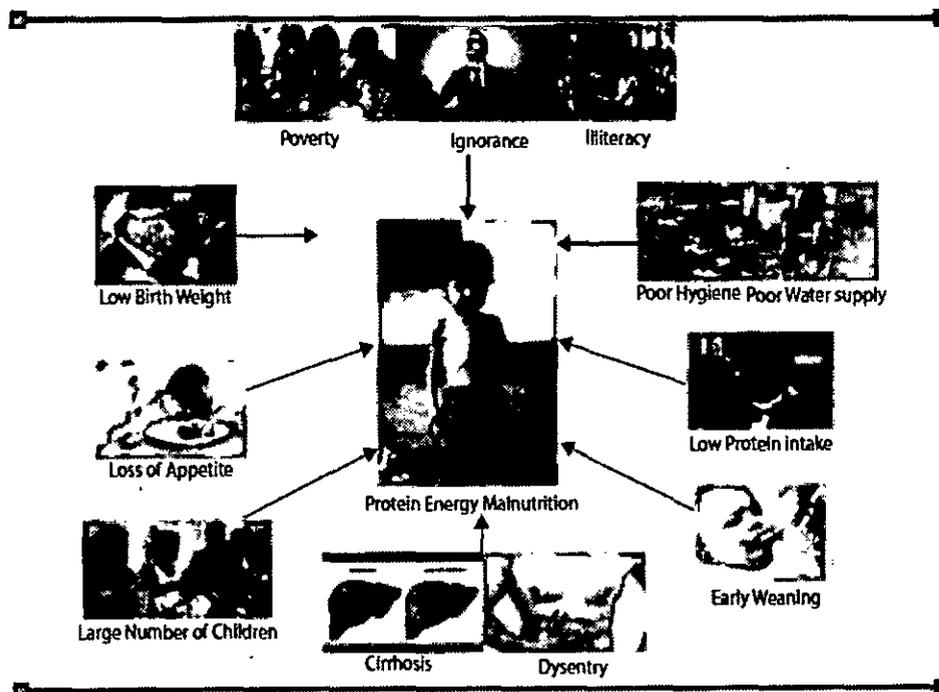


▲ Fig. 5 Undernutrition in Children in India

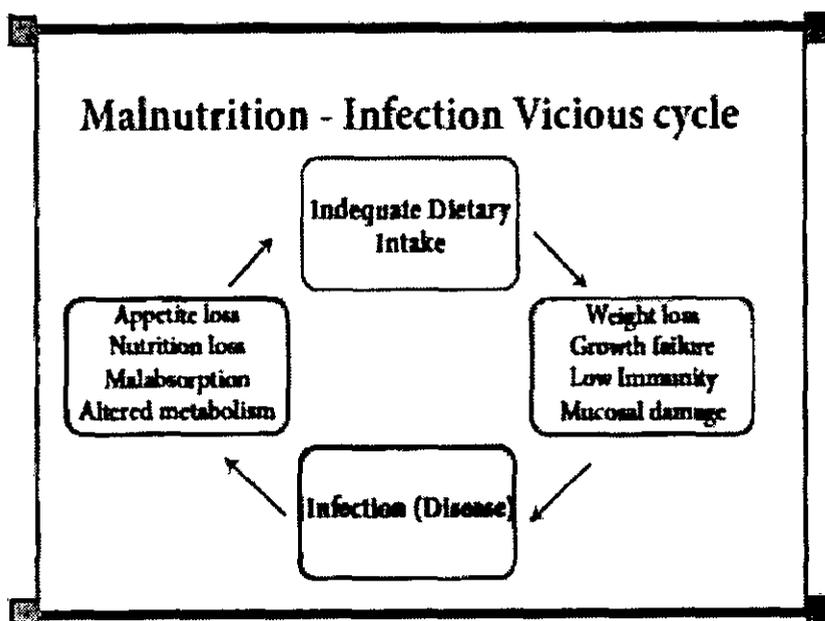
The global Nutrition report 2017 states that 38 percent of Indian children are stunted and 21 percent are severely wasted highlighting that proper nutrition is the solution to end poverty and fight disease conditions in our country

Malnutrition is the condition that develops when the body does not get the right amount of the vitamins, minerals, and other nutrients it needs to maintain healthy tissues and organ function.

Causes and prevention of malnutrition



▲ Fig. 6 Causes of Protein Energy Malnutrition

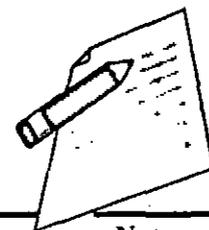


▲ Fig. 7 Vicious Cycle of Malnutrition

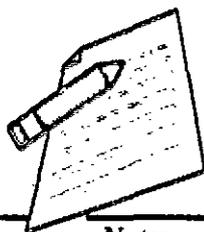
Protein Energy Malnutrition

It is a group of body depletion disorders which includes kwashiorkor, marasmus and the intermediate stages.

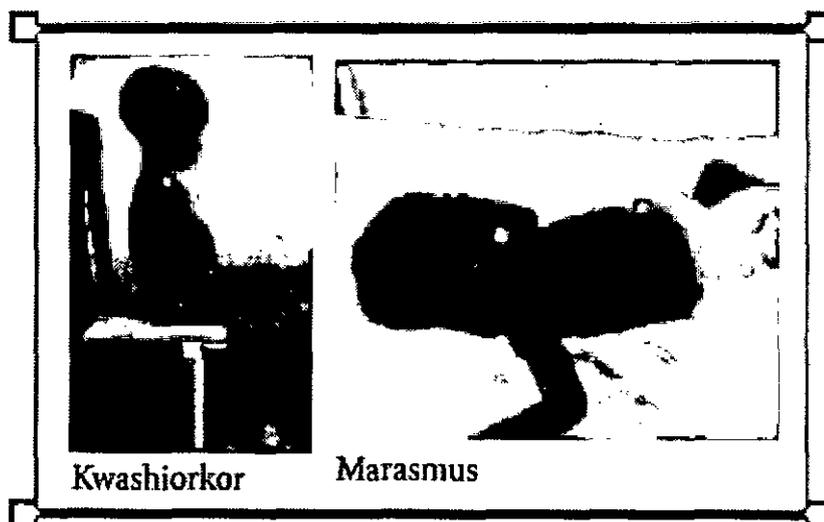
i. Marasmus: Marasmus is derived from the Greek Word "Marasmos" which means wasting. Marasmus involves inadequate intake of calories and protein. It represents simple starvation. The body adapts to the stress of deficit in protein and calories.



Notes



Notes



▲ Fig. 8 Signs and symptoms of

ii. **Kwashiorkor:** Kwashiorkor is a form of severe protein-energy mal-nutrition with sufficient calorie intake, but with insufficient protein consumption, and this feature distinguishes it from marasmus.

Table 2. Difference between Marasmus and Kwashiorkor on signs & symptoms

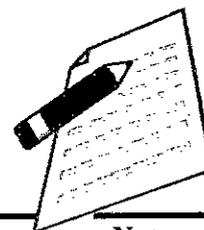
	Kwashiorkor
Severe growth retardation	Low body weight
Loss of subcutaneous fat	Pitting edema on feet and legs
Severe muscle wasting	Puffiness (edema) on face (moon face)
Wrinkled Skin	Apathy and irritability
Failure to thrive,	Scaly pigmentation of skin
Dehydration	Loss of hair
Temperature is subnormal	Hair discoloration
Frequent watery diarrhoea and acid stools	Anorexia
Oedema and fatty infiltration are absent	Diarrhoea due to defective digestion
Irritability, fretfulness and apathy	Hyper pigmentation

Source: www.yourarticlelibrary.com/flood/constituents/constituents-of-food-and-its-functions/64425

Steps to alleviate malnutrition

Health Promotion:

- Measures direct to pregnant and lactating women (education, supplement)
- Promotion of breastfeeding
- Development of low-cost weaning food
- Educating mothers to plan and space child birth
- Ensuring food security in the home
- Ensuring clean environment
- Specific protection:
- Increase intake of protein and energy rich food (e.g., milk, egg, fresh fruits)



- Educating people towards regular immunization
- Promote intake of fortified foods.
- Early diagnosis and treatment:
- Baseline information
- Early detection of clinical signs of protein energy malnutrition
- Regular assessment of body mass index
- Biochemical and laboratory investigations.

Rehabilitation:

- Hospital treatment
- Nutritional rehabilitation services (NRC i.e., Nutritional Rehabilitation Centres)
- Follow up care

Recognising Nutritional Deficiency Disorders

You can also assess the nutritional status of a person by observing the signs and symptoms of various nutritional deficiency diseases. The presence of one or more deficiencies will mean poor nutritional status. You have already read that when the nutrients provided in the diet are either consumed below the required levels or are not properly utilised by the body, it results in the state of nutritional imbalance. This leads to “nutritional deficiency” in the body.

For example, vitamin A is important for normal vision in dim light. If your diet does not provide sufficient vitamin A, it will lead to vitamin A deficiency in your body. It will affect the normal functioning of your eyes, for example, you will not be able to see in the dark (night blindness), your eyes will lose clarity and may become cloudy/muddy. Similarly, you will see that the child suffering from protein and energy malnutrition is shorter and thinner as compared to the other children of same age eating sufficient energy and proteins in their diets. Such physical differences are indicative of a nutritional deficiency disease. These are usually specific and are, therefore, helpful in recognising different deficiency diseases in and around you.

Vitamin A Deficiency

The lack of vitamin A in the diet leads to vitamin A deficiency.

Signs and symptoms

- (i) Eye changes begin with night blindness, that is, inability to see when it is dark. If it is not treated, it leads to complete blindness.
- (ii) Drying of the white portion of the eye.
- (iii) Increased rate of infections especially of the respiratory system.

Deficiency of Iron

Anaemia means low level of haemoglobin in the blood. Haemoglobin is the red pigment in the blood and it helps in carrying oxygen to different parts of the body. Haemoglobin level decreases when iron is deficient in the diet.

In other words, anaemia is caused due to deficiency of iron. Anaemia can also be caused when there is lack of folic acid and vitamin B12 in the diet.



Signs and symptoms

- (i) General body weakness. The person complains of tiredness and breathlessness.
- (ii) Loss of appetite.
- (iii) Paleness of tongue, white portion of eye and nail beds.
- (iv) Feeling of being pricked with pins and needles on the fingers and toes.
- (v) Brittle and spoon shaped nails.
- (vi) The capacity of a person to work decreases considerably.

Iodine Deficiency

Iodine is an important component of thyroxine hormone. This hormone controls most of the metabolic processes of the body. Iodine deficiency is most commonly seen as goitre in adults and cretinism in young children. Iodine deficiency during pregnancy is harmful both for the mother and child. However, you must remember that these are not the only problems of iodine deficiency disorders (IDD).

Signs and symptoms

In adults

- (i) The neck becomes swollen. This is called goitre.
- (ii) The person may become fat.
- (iii) The person feels tired and is unable to work properly.
- (iv) Skin changes may also occur.

In young children

- (i) Growth retardation
- (ii) Mental retardation
- (iii) Speech and hearing defects
- (iv) Disorders of nerves and muscles causing inability to control movements of limbs.

SUMMARY

The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status. You know that we need a nutritious diet for our well-being and good health. When our body receives all the nutrients in appropriate amounts so as to meet the needs of the body, then we are in the state of good nutrition. We have a normal nutritional status. However, when the nutrients provided in the diet are inadequate or not utilised properly, it results in a state of imbalance in the body. If this continues for some time it may develop into a severe problem which may even prove fatal. When there is a lack of excess intake of one or more nutrients and/or faulty utilisation of nutrients in our body, it leads to the state of imbalance in the body. This condition is known as malnutrition. There are two types of malnutrition. The condition of health of a person that results due to the lack of one or more nutrients is called under nutrition. However, when there is an excess intake of nutrients, it results in over nutrition. Thus, the condition of malnutrition covers both the states of under nutrition and over nutrition. You must have seen people who eat energy rich foods in amounts more than what is required by their bodies become fat/obese. This is the result of over nutrition. This state of being obese is harmful as it may lead to serious health

problems. But under nutrition is more common around us. In fact, malnutrition has become a synonym of 'under.



Notes

EXERCISE

Multiple Choice Questions

Fill in the blanks in each of the following statements by choosing the appropriate word from those given in the brackets : (deficiency, over nutrition, obese, under nutrition, normal)

1. Malnutrition refers to both _____ and _____
2. Under nutrition results due to _____ of one or more nutrients.
3. If you eat too much of energy rich foods, you may become _____.
4. Eating balanced food and having normal utilisation of nutrients leads to _____ nutritional status.

Answers:- (1) under nutrition, over nutrition (2) deficiency (3) obese (4) normal

Review Questions

1. What do you mean by nutritional status? Discuss.
2. What is *malnutrition*?
3. Describe the various methods of assessing nutritional status of a person.
4. Make a list some of the common nutritional deficiency diseases. State signs and symptoms of each.
5. Explain the causes and prevention of malnutrition?
6. Discuss deficiency of vitamin A and Iron?



Notes

7

FOOD PRESERVATION

Food Preservation:- importance, principles, household methods of Preservation.

- Understand the concept of food preservation.
- Understand the importance of food preservation.
- Discuss the principles of food preservation.
- Describe the methods of food preservation.

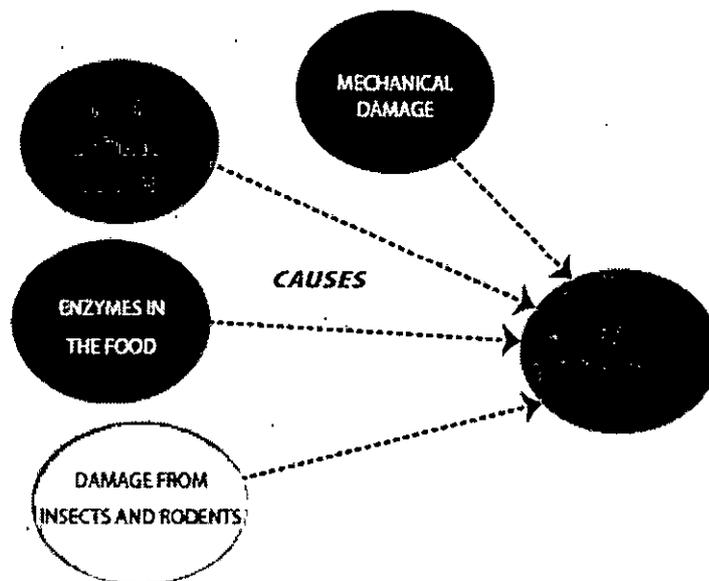
Objective of the chapter:

The basic objective of this chapter is to throw some light on the initial concepts of food preservation so that the methods of food preservation can be learned.

Preservation of Food

Introduction

Millions of fruits and vegetables are produced each year and they are lost due to poor processing and preservation. Fresh fruits are abundant during the season and are not available during off season. Due to this the food has to be stored until the next season. Fish and meat too have to be pre-served as all that is killed or caught cannot be eaten at one time. Bacteria, fungi and yeasts tend to decay the food and render it unfit to eat. Hence all fresh foods have to be preserved if it is to be used after a period of time.



▲ Fig. 1 Causes of food spoilage



Besides when food spoils, they undergo physical and chemical changes that results in the food becoming inedible or hazardous to eat. The chief causes of food spoilage are;

- The growth of microorganisms like bacteria, yeast and moulds.
- The action of enzymes that normally occur in the food.

Other causes of spoilage are non-enzymatic reactions in food such as oxidation and mechanical damage such as bruising and damage from rodents and insects.

In order to prevent food spoilage and ensure food security and availability, various food preservation techniques have been used over the several years. The earliest steps in food preservation are drying of grains and nuts. Later salting, smoking and drying were applied to pre-serve the food.

Definition of Food Preservation

Food preservation is known as "the science which deals with the process of prevention of decay or spoilage of food thus allowing it to be stored in a fit condition for future use".

Preservation also can be defined as "the state in which any food may be retained over a period of time without being contaminated by pathogenic organisms or chemicals, without losing optimum qualities of colour, texture, flavour and nutritive value."

Importance of food preservation

Food production and supply does not always tally with the demand or needs of the people. In some places, there is surplus production of food product, whereas in some other place there is inadequate supply. It is therefore important to improve and expand facilities for storage and preservation of food to ensure its availability and acceptability at all times.

Preservation ensures:

- Increase in shelf life of foods.
- Availability of seasonal foods through-out the year.
- Stability in prices of food as there will not be a deficit in supply.
- Good quality
- Edibility – texture and flavour
- Retention of nutritive value
- Retention of original colour of food.

For the process of preservation, a preservative (e.g., salt, sugar, vinegar) is needed.

Principles of Food Preservation

1. Prevention or delay of microbial de-composition.
 - By keeping out microorganisms and preventing contamination from pathogens. It involves applying the strictest rules to minimize the risk of infection (asepsis).
 - Removal of microorganism through usage of membrane which retains microorganisms (filtration).
 - By hindering the growth and activity of microorganisms (refrigeration, dehydration, addition of chemical preservatives).
 - By killing microorganisms (boiling, irradiation).



Notes

2. Prevention or delay of self-decomposition of food
 - By destruction or inactivation of enzymes (blanching).
 - By prevention or delay of chemical reactions (anti-oxidants).
3. Prevention of damage caused by mechanical causes, insects and rodents.

Food Preservation Methods

Many foods cannot be stored as such and need to undergo a treatment or a technique which helps to prevent spoilage. The techniques adopted to preserve the foods are grouped into **traditional techniques and modern industrial techniques**.

Traditional techniques include curing, freezing, boiling, heating, sugaring, pickling, canning, smoking, salting and fermentation. Modern industrial techniques involve pasteurization, vacuum packing, artificial food additives and irradiation.

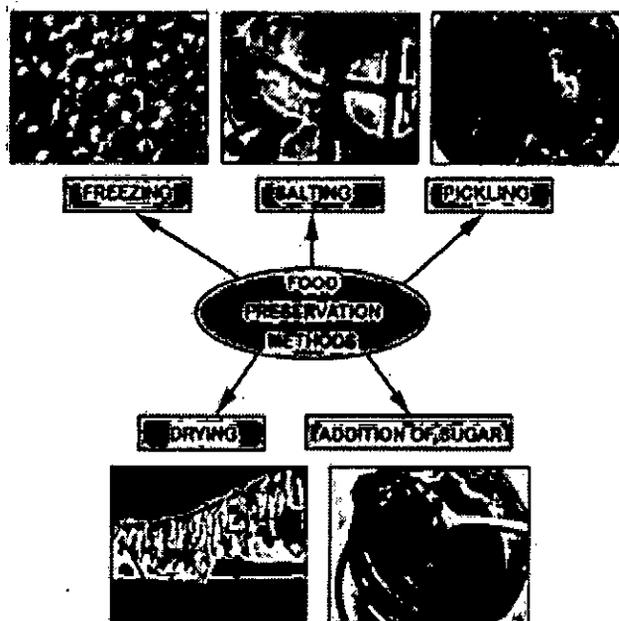
In this chapter, preservation techniques are discussed under the following headings. They are use of low temperature, use of high temperature, dehydration, use of chemical preservatives and preservation by high osmotic pressure.

Preservation of Foods with Low Temperature

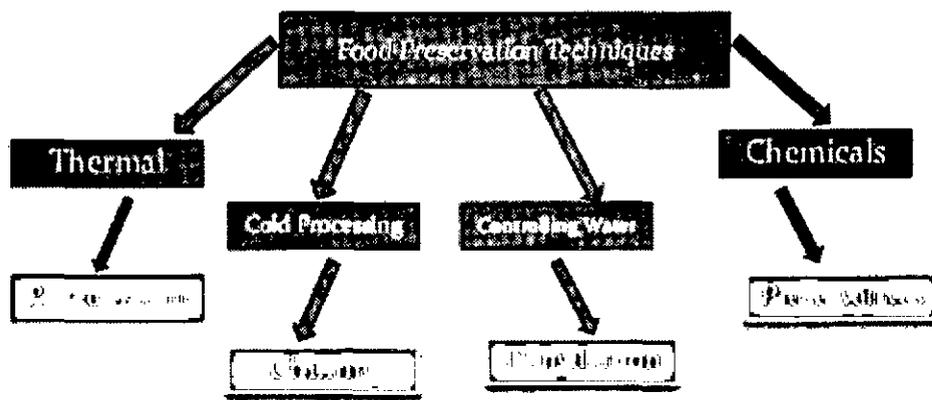
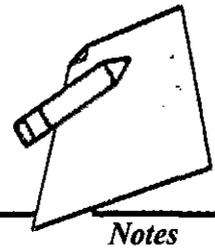
Use of low temperature reduces the microbial activity and enzyme activity thus prolongs shelf life of foods. Two different temperatures are employed in low temperature namely chilling temperature and freezer temperature.

Chill Storage

Chill temperature is just above the refrigerated temperature. In chilling fish, the temperature is reduced to freezing point of water. Chill temperature delays both bio-chemical and bacteriological changes. The deteriorative changes are retarded when low temperature is maintained. Hence the shelf life of food is improved and this ensures preserving natural and functional properties of food. Storage at -1°C and -4°C can provide stability in the presence of food preservation.



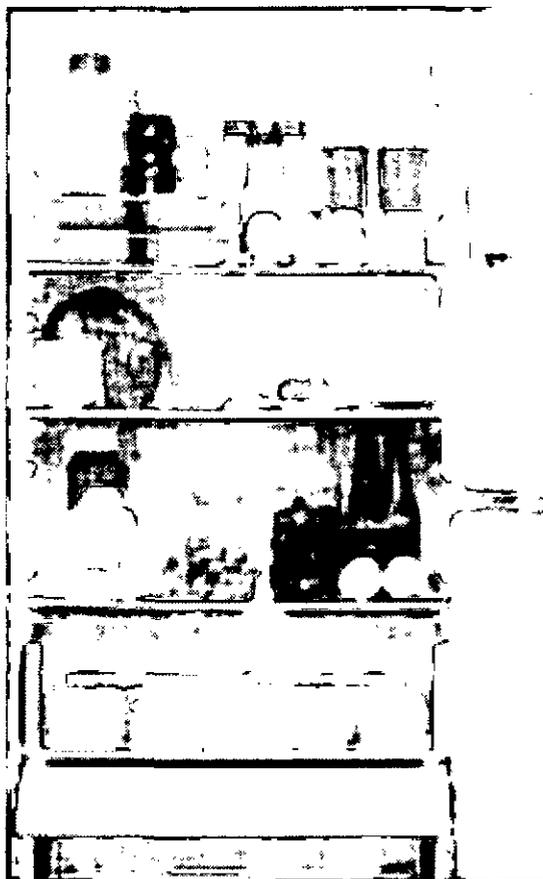
▲ Fig. 2 Methods of food preservation



▲ Fig. 3 Techniques of food preservation

Freezing

Freezing is a means of preserving food through the application and maintenance of extreme cold temperature (-4°C to -40°C). It is effective because most of the water of the food tissue is changed from the liquid to the solid state. This change in the physical state of water retards enzymatic action and stops microbial growth, the cause of food spoilage, thus preserving food. Many foods can be frozen for twelve months or more without major changes in size, shape, texture, colour and flavour.



Food stored in the refrigerator



Notes

Table 1 Comparison Data of Shelf Life of Frozen and Refrigerated Foods

Vegetables/ Meat/Dairy/ Fruits	Refrigeration	Freezing
Pears	5 Days	One year
Butter	1-2 months	9 months
Milk	8-20 days	3 months
Lean fish	1-2 days	6-10 months
Fatty fish	1-2 days	2-3 months
Poultry	1-2 days	6-9 months
Bread	1-2 weeks	2-3 months
Flour	1 year	1-2 years
Corn	1-2 days	8 months
Green peas	1-2 days	8 months
Spinach	5-7 days	8 months

Source: foodclubkitchen.com

Slow freezing process

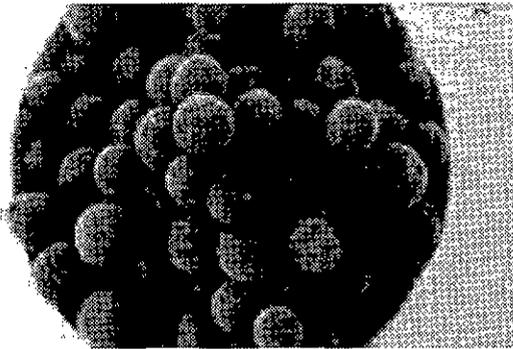
It is also known as sharp freezing. In this method, the food is frozen under temperatures ranging from -4°C to -29°C . Freezing may require three to seventy-two hours under such conditions. Home freezing is done by this method.

•Quick freezing process

The temperatures used in the quick-freezing process range from -32°C to -40°C . It freezes food so rapidly that fine crystals are formed. The time taken for quick freezing is significantly lower than that of slow freezing. In quick freezing, large quantities of food can be frozen in a short period of time. The use of very low temperature for both freezing and holding frozen products adds to the cost but is desirable for many products in terms of retention of palatability and nutritive value.

Dehydro freezing

Dehydro freezing of fruits and vegetables is the drying of the food to about 50 percent of its original weight and volume and then freezing the food to preserve it. The quality of dehydro frozen fruits and vegetables is equal to that of fruits and vegetables which are frozen without preliminary drying. The cost is marginally less because of weight and volume savings in packing, freezing, storing and shipping.



Frozen grapes



Normal grapes

Points to be Considered Before Freezing Food

Vegetables:

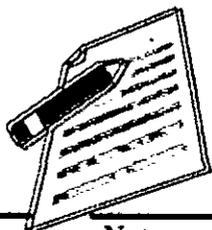
Blanching (dipping the products in boiling water for two to three minutes) vegetables before freezing reduces the number of microorganisms, removes some air from the tissues, makes them more compact and enhances their colour. Its most important function is to inactivate enzymes otherwise that would cause deterioration in palatability, colour and ascorbic acid content during storage.

Fruits:

The enzymes of fruits can be inactivated by blanching but it is not done as it gives the fruit a cooked flavour and soft texture. Rather fruits are cut directly into sugar syrup or sugar to prevent oxidation. Sugar not only increases the sweetness but helps to retain volatile aroma.

Meat and poultry:

Meat and poultry require only wrapping for freezing. After slaughtering the animal, the pork, meat and poultry is chilled promptly to avoid spoilage. The tendency of the fat of the pork and poultry to become rancid during storage in a freezer is aggravated by storage before freezing.



Notes

Preservation by High Temperature

The temperature and time used in heat processing a food depends upon the effects of heat on food and the other preservative methods employed.

Pasteurization

Pasteurization is a heat treatment that kills part but not all the microorganisms present and involves the application of temperatures below 100°C. The heating, maybe by means of steam, hot water, dry heat or electric currents and the products are cooled immediately after the heat treatment. Milk is usually pasteurized.

Pasteurized products are not sterile. They contain vegetative organisms and spores which are still capable of growth. Hence many pasteurized foods must be stored under refrigeration. Pasteurized milk can be stored for over a week under refrigeration while pasteurized milk stored at room temperature will spoil within a day.

Table 2 The Time and Temperature for the Pasteurization of Various Food Products

Food	Temperature (°C)	Duration
Milk	62.8	30 mts.
	71.7	15 sec.
Ice cream mix	71.1	30 mts.
	82.2	60-20 secs.
Grape wine	82-85	1 min.
Dried fruits	65.6-85	30-90 mts.
Bottled grape juice	76.7	30-90 mts.
Carbonated juices	65.5	30 mts.

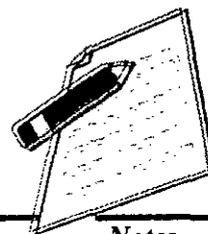
Source: Food Science III Edition, New Age International publishers Srilalshmi. B. (2006), Chennai

Blanching

Blanching is a heat treatment like pasteurization. It is done by dipping the products in boiling water for two to three minutes at 180°F to 190°F. Blanching focuses on deaerating the product and inactivating degradative enzymes before further processing. Blanching is an important step in freezing food, as frozen foods can develop off flavour, vitamin losses and colour changes while in storage.

Blanching

- Prevents bacterial growth.
- Fixes the natural colour of vegetables – holds the colour.
- Shrinks the product, better for filling the container.



Notes



Blanching of tomatoes

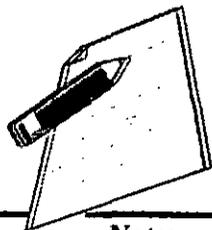
Canning

Canning involves the application of temperatures to food that is high enough to destroy essentially all microorganisms present. It also involves airtight sealing in sterilized containers to prevent recontamination. The degree of heat and the length of time of heating vary with the type of food and the kinds of microorganisms. Large quantities of food are canned for preservation. In developed countries, canned foods form a major part of the diet of the people. Items often canned are meats and meat products, fruits and vegetables, fish products, soups, etc.



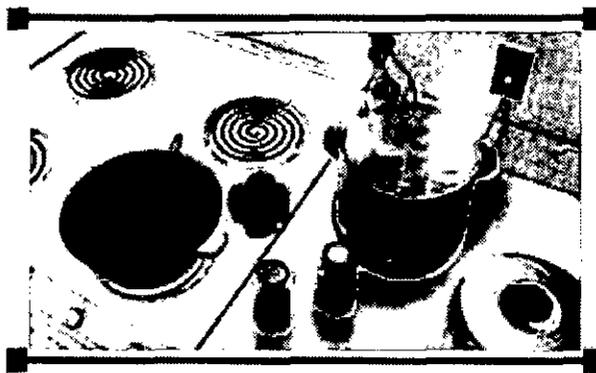
The process of canning involves the following steps:

- Receiving, cleaning, grading and inspecting of raw commodity.
- Blanching to inactivate enzymes.
- Placing in the container with added brine or syrup and deaeration of the product.
- The next process is exhausting. Exhausting is done to expel the air and gas from the can so that its internal pressure, after heating and cooling, is the same as the atmospheric pressure. After exhausting, the filled cans are permanently sealed mechanically.
- The sealed containers are subjected to high temperatures, to destroy the most heat resistant organisms.
- After this, the cans are cooled by water in a cooling canal to about 38°C, before storage.



Notes

The final step is casing and storing the cans.



▲ Fig. 4 Home scale canning

Preservation by Dehydration

Dehydration is the extraction of moisture from food products like fruits, vegetables, herbs and meat. It inhibits the growth of microorganisms and imparts a long storage life. This is a modern development of smoking and drying. Some changes that occur during the process of dehydration are:

- Chemical changes
- Browning and flavour changes
- Denaturation of proteins
- Concentration on the surface of the food (case hardening)

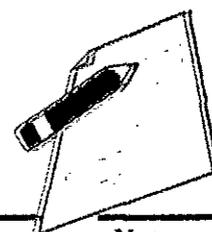
Dehydration can be done by drying and salting. Evaporation is quickened with the addition of moderate heat which is sometimes provided by natural sunlight. The ultraviolet rays from the sun serve to kill microbes. Modern methods of dehydration use circulating air that is heated just enough to promote dehydration without cooking the food. Food preservation by drying is one of the oldest methods used by human beings. Drying is one of the methods used for dehydration.

Drying

Drying is the method nature resorts to pre-serve foods. Natural drying was adopted by early man to dry fruits, fish and meat by exposing them to the sun.



Dried tomatoes



Sun drying is used in many parts of the world for preserving certain foods, such as fruits and nuts. However, this method can be used only if the climatic conditions are hot with low humidity. In many cases foods are pre-treated before drying to make the structure more porous and to facilitate transfer of moisture, thereby speeding the drying rate. Food porosity increases the chance of quick solubility on reconstitution, but is at a disadvantage due to increased bulk and shorter storage stability. Vegetables like beans, peas, potatoes, cauliflower, ladies' finger, garlic, onion and all leafy vegetables can be sundried.

Changes during drying

- Shrinkage occurs on the surface first and then proceeds to the inner layers. With quick high temperature drying of food, the surface becomes dry and rigid long before the center dries out.
- Dried food pieces may also contain cracks and pores of various diameters. The shrinking and pore clogging by the solutes is known as core hardening. It can be minimized by gradual drying with low surface temperature.
- Foods that lack good structure and are high in sugar content, give an impression of retaining moisture even after the drying process. Fruits like grapes and figs have high sugar content and lack good structure, hence appearing moist even after dehydration.
- Complete prevention of these changes is impossible. They can be minimized by using appropriate technology.

Methods of Drying

A number of drying methods are available; some are suitable for liquids, others for solid foods or mixtures containing food pieces. The common drier types used for liquid and solid foods may be categorized as the air-convection drier, drum or roller drier and vacuum drier.

Types of Driers

Air-Convection drier—In the air-convection drier, hot air supplies the heat for evaporation. Though there are different types of air-convection driers, they all have an insulated enclosure, a means of circulating air through the enclosure and a means of heating this air.

If liquid, the food may be sprayed or poured into pans or on belts. Food in the form of a fine spray or mist is introduced into a tower or chamber along with heated air. The small drop-lets come into contact with the hot air, blast off their moisture, become small particles and drop to the bottom where they are removed. This method can produce a high-quality product even with heat sensitive products like milk, eggs and coffee.

Drum or Roller drier—Liquid foods, purees and mashes are dried by this method. The food to be dried is applied, as a continuous thin layer, on to the surface of a revolving drum or between a pair of drums moving in opposite directions heated by steam. The dried layer of food is scraped by a scraper blade positioned at a point on the drum. Foods that are sticky cannot be scraped when it is hot. Such a sticky food becomes brittle when cooled, which facilitates scraping. For heat resistant food products, drum drying is one of the inexpensive dehydration methods.

Vacuum driers—This method is quite expensive but gives good quality foods. It consists of a vacuum chamber that can withstand air pressure and contains shelves to hold food. The shelves are heated. The food gets heated by conduction and radiated heat. Liquid foods



Notes

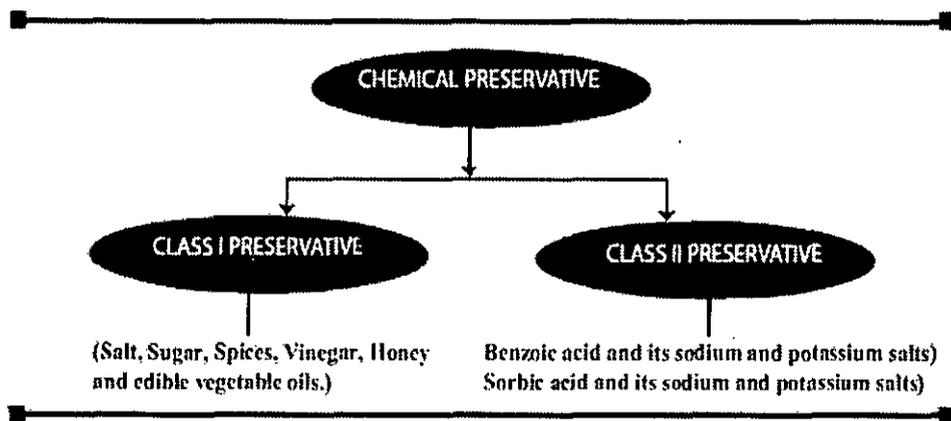
dehydrated by vacuum drying have a puffed structure and are easily dissolved in water. There is minimum flavour change and heat damage because low temperature is used in this method. Dried foods are very convenient as they are light weight, take up little storage space and can be stored for long periods as emergency foods.

Smoking of Foods

Smoking is mostly done to preserve the meat. This process helps to develop flavours in it. Wood smoke contains small amounts of formaldehyde, higher aldehydes, formic acid, acetic acid and resins. These compounds have antiseptic properties and destroy microorganisms present. The temperature and period of smoking vary with the type of meat. In sausages, the smoking is done for a few hours after smoking the material is packed in polythene bags and kept at refrigerated conditions.

Preservation by Chemical Preservatives

Preservatives are chemical agents which serve to retard, hinder or mask undesirable change in food. Preservatives help in retaining the original quality of food and delaying their spoilage.



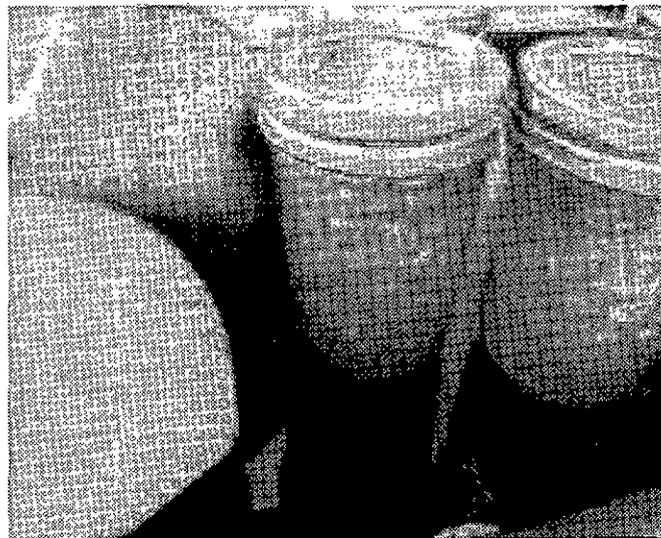
Preservatives are classified into class I and class II preservative. Class I preservatives are available at home. Class II preservatives are prepared in the industries.

- Sulphur dioxide is the only permitted preservative used in the form of sulphites.
- In India, sodium benzoate, sulphites and sorbic acids are permitted preservatives used in fruits and vegetables.
- Dried fruits are treated with sulphur dioxide to conserve the colour and to prevent the growth of microorganisms.
- Sodium benzoate is preferred to benzoic acid because of its solubility and used in tomato ketchups, sauces, jams, jellies, pickles and fruit juices.
- Sorbic acid and its salts are effective against yeasts and moulds but less effective against bacteria. They are good preservatives for foods with high fat content e.g., low fat spreads and processed cheese.

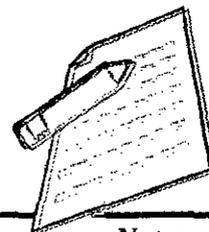
Preservation by High Osmotic Pressure

The principle of osmosis is used to pre-serve jams, jellies and pickles. In this process, water tends to draw out from microbes (plasmolysis) and makes it dehydrated, thus killing them.

But yeasts and moulds are relatively resistant to high osmotic pressure. Hence, preserved foods like pickles tend to spoil if not stored properly.



Mango jam



1. High Concentration of Sugar

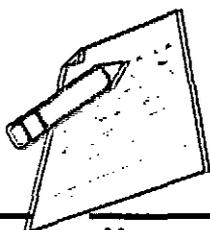
Sugar is used to preserve fruits. Preserving fruits in honey to avoid spoilage is a well-known practice. Nowadays jams and jellies prepared from fruits have a high concentration of sugar and it acts as a preservative. Pectin, acid and sugar are essential to prepare jam. Jam or jelly are prepared by adding commercially prepared pectin and it also reduces the cooking time. Jellies are clear substances made of fruit juice or the extract of a fruit.

Sugar acts in the following ways:

- Sugar draws the water out of food therefore making it unavailable for microorganisms.
- As a result of water loss, microbial metabolism is stopped.
- Hence, the growth of microorganisms is stopped.

Preparation of jelly:

- Under-ripe fruits are used, because the pectin content is high and good acidity is essential for a good jelly.
- Pieces of fruit are completely immersed in water and cooked for 10–20 minutes. Hard fruits like guavas need to be cooked for 45 minutes.
- After the fruit is cooked, it is strained without disturbing the fruit pieces.
- The fruit extracts contain pectin which determines the addition of sugar. When the level of pectin is high, it needs more sugar but requires less boiling time.
- Rapid boiling facilitates rapid evaporation, which avoids strong flavour and darkened colour.
- Then the jelly is poured in bottles or moulds, and allowed to set without any disturbance.



Notes

Preparation of jam:

- Fruits like apples are cooked with skin and made into pulp with the strainer for making jam
- Equal quantities of sugar and pulp are taken to make jam.
- After it is cooked, it is transferred to a sterilized bottle and allowed to cool.

Test for doneness for jam

Sheet test – the mixture is allowed to drip from a large cool spoon. If the syrup forms a sheet instead of two separate drops, the jam is done.

Bubble test – when the end point reaches, big bubbles can be seen throughout the jam.

Plate test – set a plate in the freezer for some time. Put the jam and tilt the plate slowly. The jam should come down as a whole mass forming “U” shape. Water should not separate out.

Fork test – dip the fork into the jam or jelly. Jam of correct consistency forms a sheet between the needles of the fork.

Honey

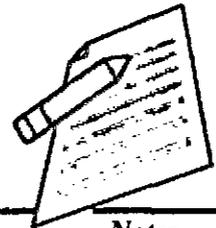
Honey is a natural preservative in its original state and was one of the earliest preservatives used by ancient civilizations. It has a high concentration of sugar that draws out the water out of yeast or bacteria cells which contaminate the food.

2. High Concentration of Salt

Foods are also preserved by the principle of osmotic pressure in salting and pick-ling. Most commonly used preservative is sodium chloride. Required quantity may be added to slow down or prevent the growth of microorganisms or enough to permit lactic acid fermentation to take place.



Salted mangoes and cucumber



Notes

Sodium chloride preserves the food by the following principles:

- It causes the high osmotic pressure and hence plasmolysis occurs.
- It dehydrates foods by drawing out and tying up moisture, as it dehydrates microbial cell.
- It ionizes to yield the chlorine ion which is harmful to organisms.
- It reduces the solubility of oxygen in the moisture.
- It sensitizes the cell against carbon dioxide.
- It interferes with the action of proteolytic enzymes.

Pickling:

In pickling, food is placed in edible liquids like brine, vinegar or vegetable oil which inhibit or kill microorganisms.



Mango pickle



Lemon pickle

**Notes**

Sometimes, food is heated along with pickling agent so that it gets saturated with it.

Pickles may be broadly divided into three groups:

Sweet pickles e.g., tomato sweet pickle, mango sweet pickle.

Sour pickles e.g., mango pickle, lime pickle.

Fermented pickles e.g., cucumber pickle, cabbage pickle, chilli pickle, meat and sausages.

The important preservative agents in pickles are salt, vinegar, sugar, oil, spices and condiments. Each has a specific role in preservation.

Salt:

Salt is employed to control microbial population in foods such as butter, cheese, cabbage, olives, cucumbers, meats, fish and bread. There are four methods of salt curing; dry salting (fish), brimming (vadu manga), low salt fermentation (chilli pickle, sauerkraut from cabbage) and pickling (lime pickle). Sodium chloride or common salt is used primarily as a preservative and flavouring agent.

Vinegar:

Vinegar is a natural preservative. Vinegar is made from a two-step process. The first process involves the carbohydrate being converted into alcohol by fermentation. The second step is its conversion to an acetic acid. The acetic acid in vinegar kills microbes and stops food spoilage. Pickling is a common method of using vinegar as a preservative. It is also used to improve the flavour of foods.

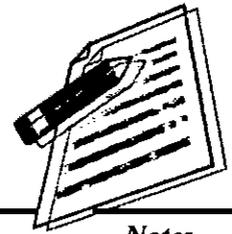
Spices and condiments:

These have bacteriostatic effect (slowing the growth and multiplication of microbes). The essential oil of spices is inhibitor of microorganism. The inhibitory effects of the spices differ with the kind of spice and the microorganisms being tested. Mustard flour and the volatile oil of mustard, for example, are very effective against *Saccharomyces cerevisiae*. In pickles like avakai and chilli pickle, mustard flour helps in the prevention of the growth of spoilage organisms in the food.

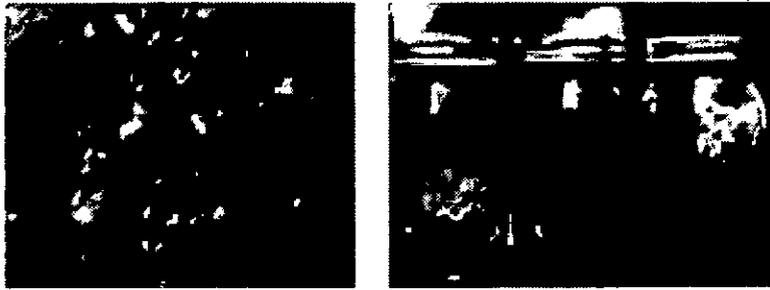
Turmeric powder, tamarind, chilli powder, asafoetida, fenugreek seed, cinnamon and cloves are usually bacteriostatic. Ground pepper corn and all spices are less inhibitory than cinnamon and cloves. Extracts of these plants have been shown to be inhibitory to *Bacillus subtilis* and *E. coli*. Allicin is the active principle in onions and garlic that kills bacteria and acts against fungi.

Oil:

In addition to salt and several spices, oils are used in making pickles. Spice mixtures and oil are added to the fruit or vegetable. It is allowed to ferment for a month or so. The fermentation process renders fruits soft and the fruit take on the additional aroma and flavour of the spices. Aerobic bacteria and mould growth are prevented by covering the top with oil. Properly prepared and stored pickles can last up to a year or more without spoilage.



Notes



Spoiled pickle

Latest techniques in food preservation

Food Irradiation

Food irradiation is a process of food preservation in which food is exposed to ionizing energy –radio isotope cobalt and cesium-137. The electromagnetic radiation suppresses the growth of most microorganisms.

Hospitalized patients, who have compromised immune systems and astronauts in space, consume irradiated foods. More than forty years of scientific research show that this process is safe. The radiant energy kills the bacteria in the food, but it does not touch the food directly.

The uses of food irradiation are:

- To avoid the use of harmful chemical compounds in insect disinfestations of stored products and microbial decontamination of spices.
- To extend the shelf life of meat, poultry and sea foods by killing microorganisms which cause spoilage.

To replace the chemicals used for slowing sprouting in tubers and bulbs and delay ripening of fruits.

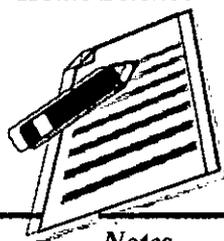
Vacuum Packing

Vacuum packing is a process that removes air from the package prior to sealing. This method involves placing items in a plastic film package, removing air from inside, and sealing the package. This technology is widely used all over the world in the packaging of milk and milk products, juice etc.

SUMMARY

116-01-001

Millions of fruits and vegetables are produced each year and they are lost due to poor processing and preservation. Fresh fruits are abundant during the season and are not available during off season. Due to this the food has to be stored until the next season. Fish and meat too have to be pre-served as all that is killed or caught cannot be eaten at one time. Bacteria, fungi and yeasts tend to decay the food and render it unfit to eat. Hence all fresh foods have to be preserved if it is to be used after a period of time. Besides when food spoils, they undergo

*Notes*

physical and chemical changes that results in the food becoming inedible or hazardous to eat. Food production and supply does not always tally with the demand or needs of the people. In some places, there is surplus production of food product, whereas in some other place there is inadequate supply. It is therefore important to improve and expand facilities for storage and preservation of food to ensure its availability and acceptability at all times. Vacuum packing is a process that removes air from the package prior to sealing. This method involves placing items in a plastic film package, removing air from inside, and sealing the package. This technology is widely used all over the world in the packaging of milk and milk products, juice etc.

EXERCISE

Multiple Choice Questions

1. Which of the following will not help to arrest the action of micro-organisms on tomatoes :
 - (a) put them in boiling water
 - (b) put them in a freezer
 - (c) leave them on the shelf.
2. The common preservative used in making squashes is:
 - (a) KS
 - (b) KSM
 - (c) KMS
3. Oil in pickles
 - (a) delays the action of micro-organisms.
 - (b) kills the micro-organisms.
 - (c) stops the action of micro-organisms.
 - (d) stops the action of enzymes.
4. Freezing preserves food because it
 - (a) delays the action of micro-organisms.
 - (b) kills the micro-organisms.
 - (c) stops the action of micro-organisms.
 - (d) stops the action of enzymes.

Answers:- 1. (c) 2. (c) 3. (c) 4. (c)

Review Questions

1. What is food preservation?
2. List four ways of delaying action of micro-organisms on apples.
3. Define preservation and shelf life.
4. Write the steps for preparation of mango pickle.
5. Write the steps of freezing methi leaves.
6. Give four reasons why we should preserve food.
7. Suggest the best method to preserve the following foods and give one reason for each selection:
 - (a) Orange juice
 - (b) Raw mango
 - (c) Apple
 - (d) Potato
 - (e) Carrots



Notes

8 FAMILY RESOURCES MANAGEMENT

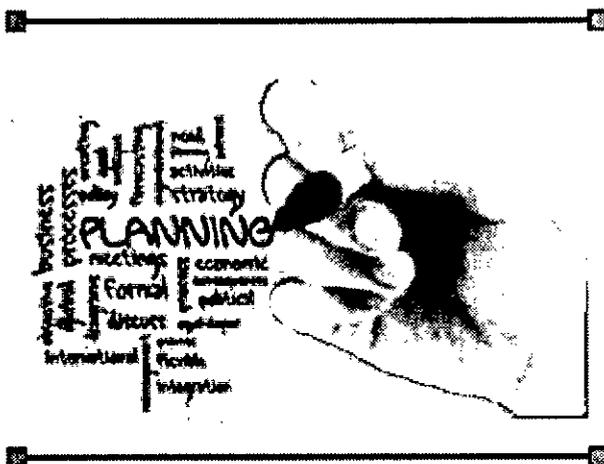
Family Resources Management:- definition, steps and motivating factors, decision making, Definition, sources and characteristics, types of resources, optimal use of resources.

- Understand the concept of family resource management.
- Understand the sources and types of resources.
- Discuss the optimal use of resources.
- Describe the decision-making concept.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of family resource management so that the sources and types of resources can be learned.

Family Resource Management



Introduction

The first contact for every individual in this world is her/his family. The family is a socially recognized unit of people united together by marriage, kinship or legal ties. Management in the context on the family is the natural outgrowth of human associations and interactions. Its ultimate aim is to provide for optimal development of its individual members. Management of family allows us to overcome our individual limitations. Through the combination of individual efforts and resources, we achieve far more than what we could do independently. Most families are not aware of all the resources at their disposal, the quality and quantity of resources that each family has, varies.



Notes

Definition and Concept of Family Resource Management

Resources can be defined as anything we use to achieve what we want (our goals). In other words, they are the materials and human attributes which satisfy our wants.

The concept of management involves planned use of resources directed towards the achievement of desired ends. This involves the weighing of values and the making of series of decisions.

In home management, a home in which goals (ends) are being attained with some degree of satisfaction may be considered as well managed home where management is practiced in an orderly manner.

Home management is the vital factor in every family contributing to the overall health, happiness and well-being and higher standard of living for the family members. In simpler terms, home management is defined as the mental process of utilising the available resources to achieve what you want in life.

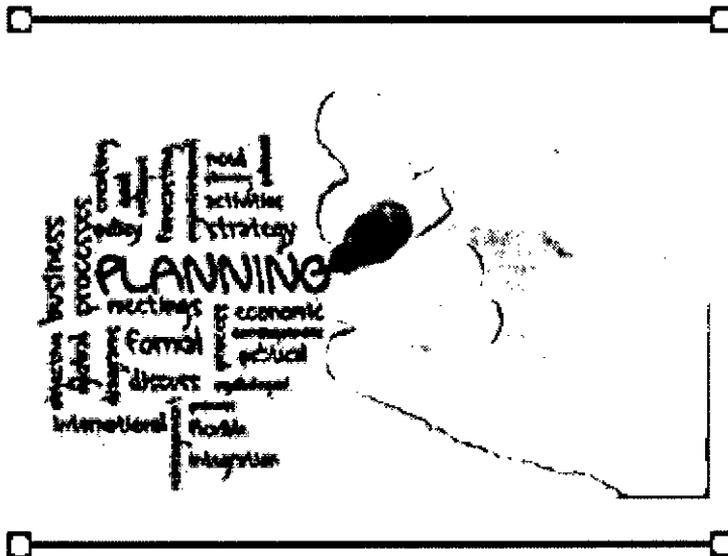
Figure - 1 indicates that **management is a process involving activities, through which action is initiated and resources are used for achieving a goal.** For this purpose, certain guidelines in the form of values, goals and standards can be formulated by every manager. For sure attainment of desired goals, it becomes essential to plan, organise, coordinate and control all the activities, so that the resources are not wasted.

Management Process:

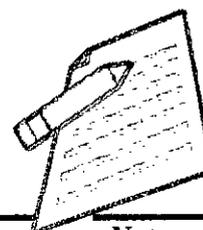
Management process consists of five steps 1) Planning 2) Organizing 3) Directing. Controlling 5) Evaluating and are discussed below in detail.

1. Planning

Planning is very important to the success of management process. It is basically working out ways or course of action to achieve the goals. Planning can be habitual or conscious.

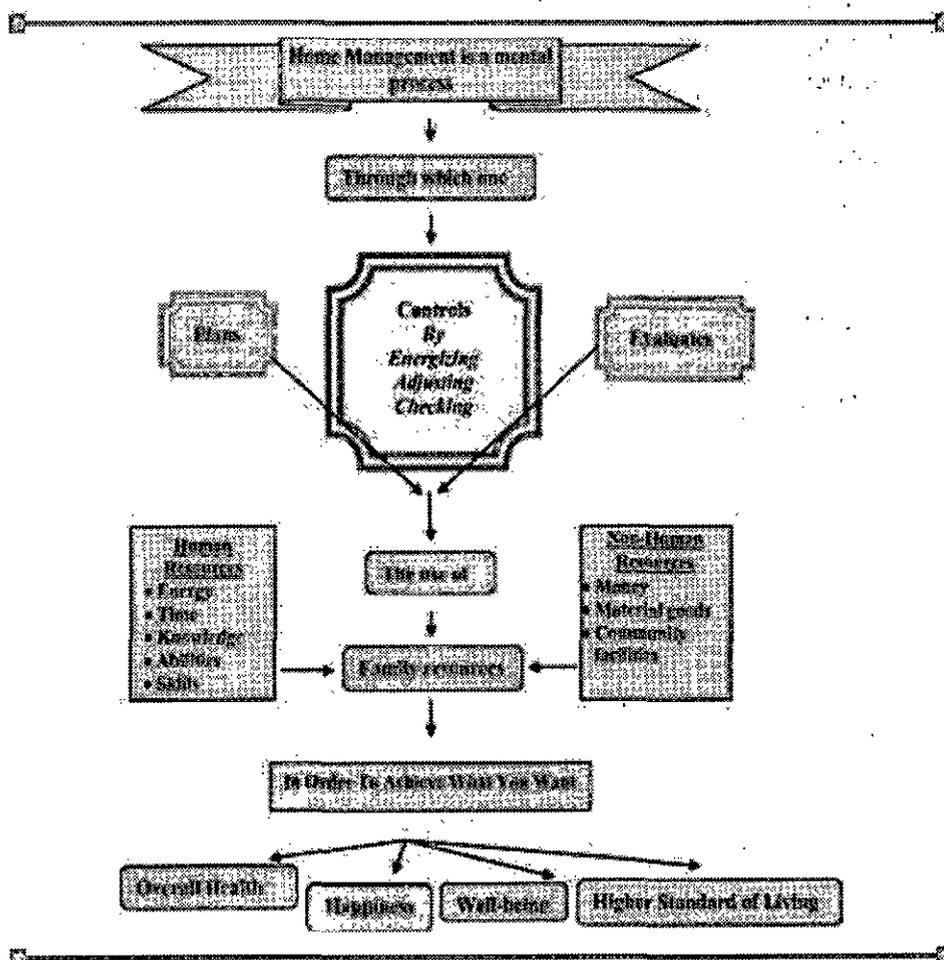


Planning involves thinking through the possible ways of reaching a desired goal. It also involves developing a sequence of actions within an overall organizational structure.



The entire task from beginning to its completion must be viewed in whole. If the paths leading to the goals are easy to see, the choice of the best plan can be made quickly. When the path is hard to see due to some obstacle, the planner must find ways of overcoming them. As children do not have enough experience, they can get the help of an experienced adult to plan. The final act in planning is arriving at a decision. **'It is the goal that releases action'**.

Good planning requires the use of the powers of thinking, memory, observation, reasoning and imagination



▲ Fig. 1 Management Proces

These powers, make it easier to plan and to meet situations in everyday living. For example, the following points should be borne in mind while planning a birthday party.

The place or the venue of the party.

Number of invitees

Menu

How much money are we going to spend?

When are we going to have the party?

While planning, the following points should be considered.

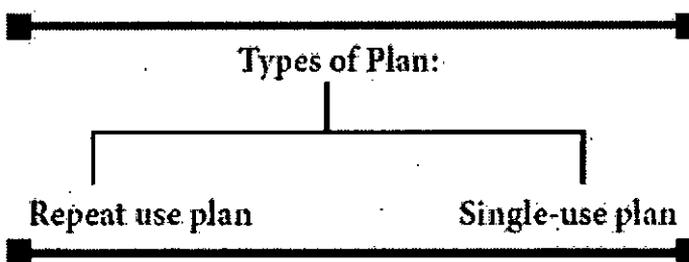
There should be a balance between the amount of resources available and the demands or needs.

The decision should be made according to individual situations.



The plan should be realistic.

The plan should be flexible.



Single-use plan is one that is developed for a specific function, event or activity with the anticipation it will not be used again. While **repeat use plan** is one that is developed in the anticipation, it will be modified and frequently used in similar situations, for similar demands or events or to resolve like problems. **Sequencing** is a phase of the planning component of management process in which all tasks necessary to achieve the goal are placed in a logical order; the standards for each task are established.

2. Organizing

Organising involves the performance of the following tasks.

Division of work among employees (assignment of duties)

Delegation of authority (transfer of official rights by a superior to his subordinate)

Creation of accountability (the sub-ordinate, to whom work has been assigned and authority has been delegated, is made answerable for the progress of work).

3. Directing

Directing the human resource does not mean the process of issuing mere orders and instructions to the subordinate staff. It is, in fact, the process of supervising, guiding and motivating the employees in order to get the best out of them. By performing the directing function, the human resource manager will also be able to get the whole-hearted support and co-operation of all his subordinate staff. This helps in the effective attainment of the enterprise objective.

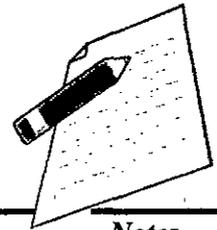
4. Controlling

Controlling is carrying out the plan. This step calls for flexibility in thinking. At times new decisions are required which may result in changes in plan. For example: when the menus are planned for meals, if certain things are not available during shopping a fresh decision need to be made. The different phases of controlling are

Energising: This is initiating and sustaining the action. The individuals who are involved in doing a particular task must be energized in order to get results. In spite of having a good plan, sometimes implementing the plan would become difficult. Here, the energizing function would act as a catalyst.

Checking: This is a quick step by step evaluation of the progress of a plan. To go to school on time one has to get the clothes, the meals and books ready, which need checking of time at all stages.

Adjusting: Adjusting is done in the plan if there is a need for fresh decisions to be taken. This should be done taking into account the problem in hand and the resources available.



Getting into action, keeping the resources mobile and knowledge of what is to be done are all important in this step.

5. Evaluating

This is a checking up process, which may help one move forward. The efficiency of the process and the quality of the end product are to be checked. When there is clear cut objectives it becomes easier to evaluate the entire process. The success or failure of the plan must be evaluated on the basis of the set goals. In case of failure the demerits of the plan may be noted and rectified while making further plans. Evaluation can be general or more detailed.

Thus, management in the home is a dynamic force in day to day living and is the administrative side of family living. The steps in the management process are interdependent and interrelated for efficient, effective and dynamic use of resources which leads to the proper management of the house, whereby goals are achieved to attain maximum satisfaction.

Motivating factors

Values and Classification of values

Values

Values, Goals and Standards are important factors in the management process. Values are the key to all motivating factors in human behaviour. Value, as a concept is vague and subjective although it is very important to an individual. Values grow out of human desire and interest. Values differ in cultures. The family has the major responsibility for fostering values among the members. **The term "value" signifies the meaning or definition of worth that is attached to any object, condition, principle or idea.** Values provide a basis for judgement, discrimination and analysis and it is these qualities that make intelligent choices possible between alternatives. Thus, values are the fundamental forces that force or motivate human activities and endeavours.

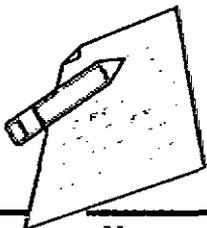
According to **Gross and Crandall (1980)** a value is always important to the person who holds it. It is desirable and satisfying. It has the ability to develop in self-creative way and it tends to endure. It is a concept of the desirable, explicit or implicit which governs our choice of methods, modes or goals.

The following are the motivating values of human behaviour—comfort, health, ambition, love, desire for knowledge, technological satisfaction, play, art, religion.

Classification of values

Intrinsic or Instrumental: An **intrinsic value** is one that is important and desirable simply for its own sake. It is worthy of being sought for itself alone. Honesty, co-operation, creativity, beauty, discipline, respect etc. are some of the intrinsic values in management. On the other hand, **instrumental values** are ways of reaching intrinsic or end values, sometimes called goal values. Therefore, they form the basic values leading to another. Planning, skills, order and efficiency and technological satisfaction are examples of instrumental values.

Factual and Normative Values: The other classification of values as factual or normative brings out the difference between the factual values that exist, regardless of their level of desirability and the normative values that have an ethical basis. The factual values also called



descriptive, generally are based on people's preferences and desires. The normative are ethical values, which carry the idea of right or wrong. Some examples of factual values are honesty, religion, loyalty, faithfulness.

Goals: Definition, Types

Goals

Goals are important factors in the management process. Goals are the desires that individuals or families are willing to work for. They are more definite and clearer than values because they are to be accomplished. They are tangible things, objects, ends or purposes. Goal is an objective or purpose to be attained. They are specific ways of realizing the values one hold.

Definition: Goal is defined as an objective, condition or something you desire to achieve or attain at any given period of time.

At present, your goals are to complete your courses and obtain higher degree so as to get job in your chosen profession. As each of these goals are achieved, new goals, will emerge leading to other higher goals in your life.

Goals, like values, play an important role in your life. Values give meaning to your life. Goals on the other hand, point the direction you want your path to follow. Thus, it can be said that values and goals are inter-related. Values are the vehicles and goals are the highways you use to attain your desired quality of life.

Types of Goals

Goals are classified under the following heads.

They are classified:

I) According to the number of groups:

Individual goals are established by an individual for himself. These are based on his own values. He puts in efforts for their achievement and receives satisfaction to himself, for example scoring 70% marks in the examination.

Group goals are established by the group. These are based on the some of the common values and interests of the group members, for example, achievement of 100% result of the class at the S.S.L.C. examination.

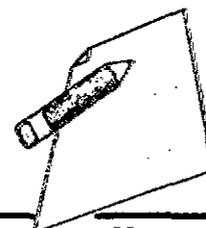
II) According to duration for achievement of goals

Throughout life each individual and each family is always seeking some objectives.

According to duration for achievement, goals are classified as short-term, intermediate and long-term goals.

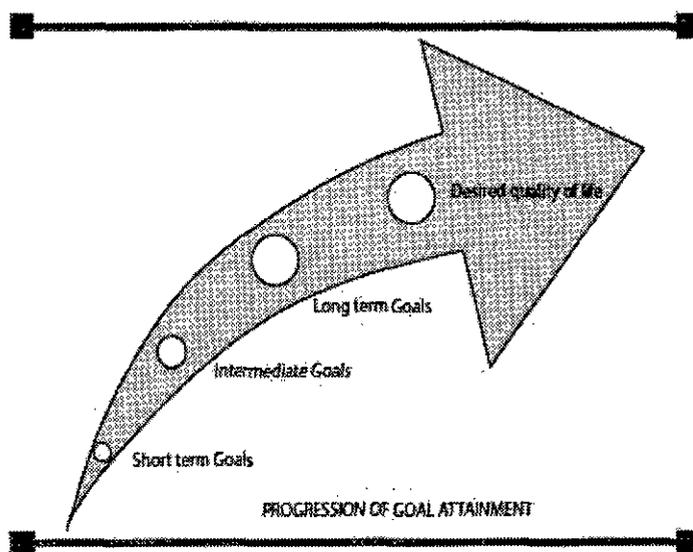
i) Short-term goals

In short term goal, the period of attainment of goal is short. Example is to successfully complete the course of study. Since the achievement is anticipated in the near future, these goals usually involve a time period of six months or less.



ii) Intermediate goals

Intermediate goals are nothing but the link connecting between short term and long-term goals. They have definite characteristics and serve a purpose in your life time achievement. The time duration involved in intermediate goals is longer than short term goals. Achievement of these goals is measured in terms of several months or years. For example, to complete your graduation you will require few years.



iii) Long term goal

The duration in achieving this goal is long. Classification differs from the other two, in regard to the time period, the degree of specificity and the extent of active implementation involved in attainment. Long term goals are those you have set for yourself in the distant future.

Long term goals may include one or more of the following – getting a good job in chosen profession, getting married, owning home or farm.

Standards and Classification of Standards

Standards

Standard is a scale of measurement of values. According to Nickell and Dorsey (1970), standards are a set of measure of values stemming from our value patterns, determining the amount and kind of interest in something and the satisfaction we receive. Standards serve as a measure or criterion for measurement of objects or ways of doing things.

There are standards that apply to a single situation or area such as standard of food or dress or conduct. Standards set the limits one will accept in working towards a goal.

Gross and Crandall classify standards as (1) conventional and (2) flexible.

i. Conventional Standards:

Conventional standards are those that are traditional and accepted by the community at large or by a social group within it. To illustrate 'high' standard of cleanliness, we can take an example of cleaning and dusting furniture twice a day. This can be standard of any family.

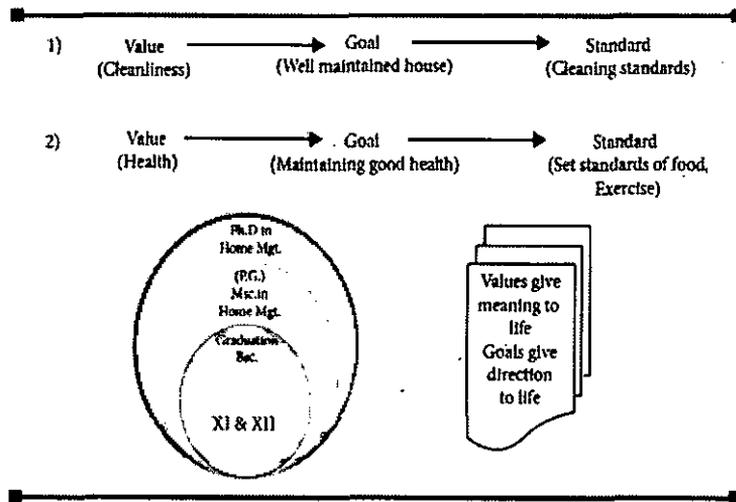


If an unexpected guest arrives and there is dust visible, the homemaker is apt to say 'I did not dust today'.

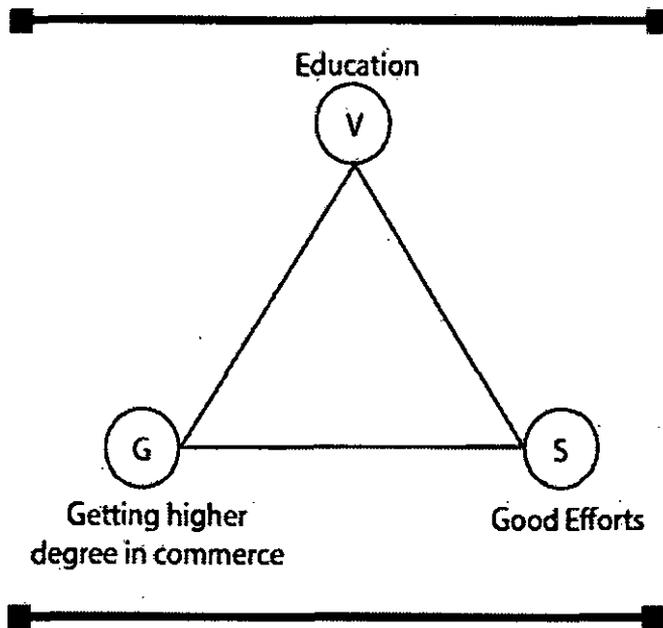
ii. Flexible standards:

Flexible standards can be changed to suit different situations; they give greater freedom of choice. Adjusting family standards to changing conditions is an example of the need to have flexibility in one's standards.

Interrelationship between goals, values and standards: Using kitchen as a selected area of the house, the concept of values, goals and standards can be illustrated as follows.



▲ Fig. 2 Inter-relationship of values, goals and standard



Key concepts in understanding motivation within the person and the family are values and standards and the closely related concept of goals.

Values give meaning to your life.

Values are a prime motivating force in all management.

Values is a dominant term



Goals are closely related to both values and standards in initiating management. They stem from values and are influenced by standards. Each exerts an influence on the other two. Goals are indicators of values. For example, the goal of owning one's home may be one expression of the value of security. Standards are specifications of values. They measure the degree of influence of a value. Standards set the limits one will accept in working towards a goal.

Decision Making

Management occurs when there is some problem to solve, some choice to make. The various steps in the management process are really a series of decisions, based upon our previous experiences. Therefore, decision making is the heart of the management. A decision can be defined as a course of action consciously chosen from the available alternatives for the purpose of desired result. So, the role of decision making in management involves knowing and actually applying essential information in problem situations of day-to-day life. Thus, it is used to achieve goals and assessing standards. Management is a mental process which involves a series of decision making.

The steps in decision making process are:

1) Defining the Problem

It involves the recognition of the problem. It needs relevant information to identify and define it first. Unless the problem is clearly defined and analysed the ultimate decision would not be effective. For e.g., planning household activities, purchasing labour saving devices, selecting clothing for the family.

2) Identifying the Alternatives

Decision making will be effective only when one identifies possible alternatives. The choice of best selection of alternatives requires thorough knowledge about the availability of resources and their limitations.

3) Analysing the Alternatives

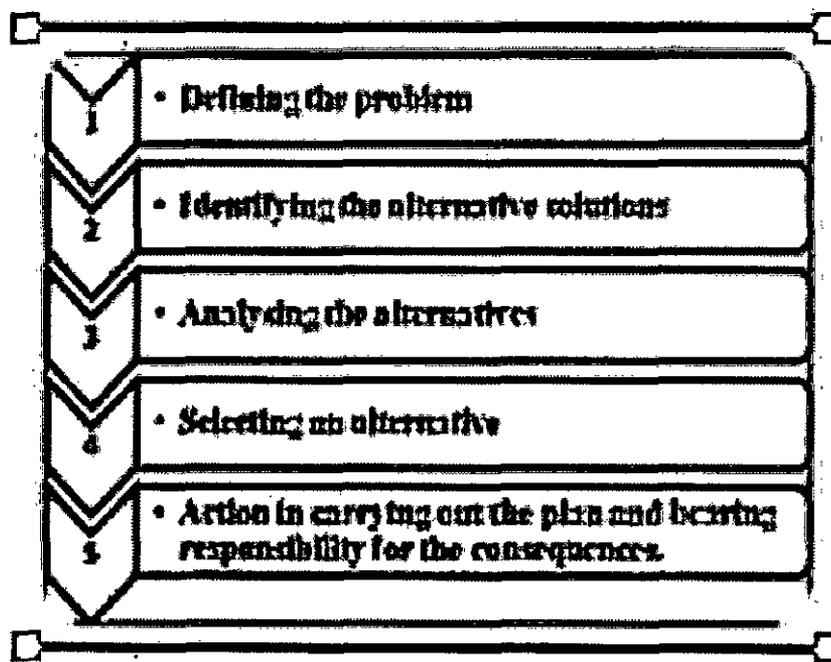
After identifying the alternatives, one should think of the consequences of each alternative systematically to find out the relevant one, considering the goals, values and standards.

4) Selecting an Alternative

After analysing the problem one should carefully select from the possible alternatives. Evaluation plays a very important role in this selection. Choosing the best from the several possible alternatives will be helpful in solving the problem.

5) Accepting the Consequences of the Decision

This is the ability to assess and accept the consequences of the decision for making future decision. It is the evolutionary process. The process of evaluating the alternatives is based on your goals, values and standards. This experience would indicate the final out-come of the decision making. It creates self confidence in people and gives feedback to make effective decisions in the future.



△ Fig. 3 Steps in Decision making

Types of Decisions

There are different types of decisions namely individual decision, group decision, habitual decision, central decision, economic decision, technical decision and decision making due to experience and knowledge.

Individual Decision

It is the decision pertaining to an individual e.g., education. Individual decisions are more quickly made. The decision making of an individual revolves around the values, goals, standards and roles the individual assures in the relevant set of frame work.

Group Decision

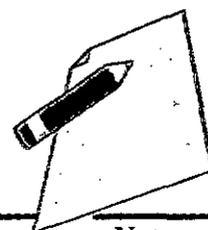
It is made from the collective action of several individuals each of whom has distinct values, goals, standards and role perception. It is a difficult process and a slow process. Role conflicts would emerge in this situation.

Habitual Decision

It is the lowest level of decision. Once an individual is trained to do systematic work, he will follow that throughout his life. They are routine, repetitive actions related to daily activities. Once it becomes a habitual choice, the resultant action is quick and spontaneous.

Central Decision

Central decision has many supporting decisions to complete the whole task e.g., purchasing a house is a central decision. This leads to look out for other supporting decisions like transportation facilities, community facilities, savings etc.



Notes

Economic Decision

It is based on allocation and exchange process relating to resource use. This decision needs the allocation of human and non-human resources to attain a goal. It reveals the allocation of resources among the combination of goals that will bring about the greatest degree of satisfaction.

Technical Decision

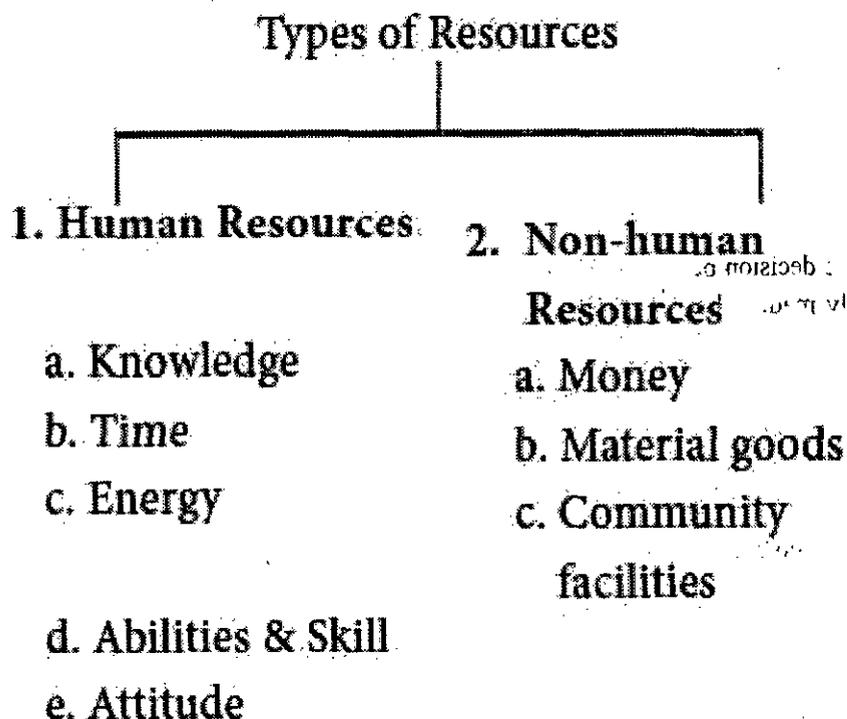
This decision involves a decision, which will enable the best combination of resources to achieve the stated goal. Decisions must be made based on past experiences and knowledge. This helps a person to become more efficient and skilled in decision making process.

Family Resources: Types and Characteristics

Family resources

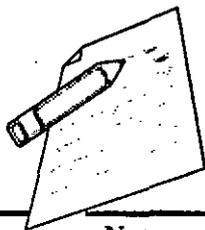
Resources can be defined as anything we use to achieve what we want (our goals). In other words, they are the materials and human attributes which satisfy our wants.

Types of Resources



1. Human Resources: These are the capacities and characteristics of an individual. These can be used only by the person who possesses them. They have the high potential to achieve what we want and many a times may not be cultivated or made available. Most of the time, families underestimate these re-sources and are unaware of them.

- i. Knowledge:** It is important to be aware of things to be able to achieve what we want. If we want to buy a T.V. we need to know what features to look for, brands available. This will help in buying a better-quality product.



Notes

- ii. **Time:** It is constant for everyone, 24 hours a day. The way a person manages and uses her time is her personal choice. A student may finish all the work before going to play; another may waste his time watching television or talking on the cell phone.
 - iii. **Energy:** This is both mental and physical power of a person. To achieve goals, one needs to plan, organise and finally implement the plans. This would require both mental and physical energy.
 - iv. **Abilities and skill:** These are inherited and acquired. These may include skills like cooking, decorating, gardening. Each individual has particular abilities with which he/ she can achieve his/her goals. These skills can also be developed by systematic learning and practice.
 - v. **Attitude:** These are opinions or feelings a person has towards a thing which may hinder or help in achieving his goals. A positive attitude may help a person achieve what he wants whereas a negative attitude may hinder her in achieving what she wants.
2. **Non-human Resources:** These are tools and assets that families have at their disposal to achieve what they want. These are available for everyone to use. A person works hard and earns money to be used by him and his family. He/she may buy material goods or land from this money and may build a house on this land. Community facilities like banks, post offices, parks, and library. These are tangible and are more identifiable.
- a. **Money:** It is the pivotal resource which can be exchanged to buy material things, commodities and services. It can also be used for future use and thus gives a sense of security to the family.
 - b. **Material goods:** These include durable goods or perishable goods used and owned by a family in their everyday use. Land, house, furniture and vehicle are examples. These help to make life easier and more comfortable for all family members. Durable goods like land can also help families to earn or save money. If vegetables are grown on land, the family can save money on buying vegetables or sell these vegetables to earn money.
 - c. **Community facilities:** These are those facilities which are common for all members of a community. Parks, libraries, post office, police and fire protection, banks, hospitals, transport facilities, roads, rail-ways, electricity, water supply, markets, community centres and ration shops are examples of community facilities. All families can avail these facilities without directly paying for them but indirectly paying for them through taxes.

Characteristics of Resources

1. All resources are useful and all help to achieve goals.
 - One cannot call energy or time as a resource if it is wasted or not used. If a piece of land is lying vacant, it is not a resource, only when a family grows vegetables on it, does the land become a resource.
2. All resources are limited.
 - There is a limit to a person's knowledge, skill, energy, material goods and money available to the family.
3. All resources are inter-related.
 - A resource cannot be used in isolation. If a homemaker has to go to the market, she will use her knowledge, skill of bargaining, time, energy, money, market and transport to achieve this goal.



Notes

- (iii) Plans are fixed in nature.
 - (iv) Everyone in the family should consult others while preparing their own plans.
 - (v) While organizing, you need to fix responsibilities to carry out the plan.
 - (vi) Anyone can do any activity to accomplish a plan.
3. List with an example the activities involved in :
- (i) Organising
 - (ii) Controlling

Review Questions

1. List any four ways of maximizing satisfaction from resources.
2. Define management?
3. List two advantages of management. Explain with an example each.?
4. List three important things involved in planning.
5. Would you change your values and standards because your friend wishes you to do so? What factors should you consider while fixing your values, standards and goals?
6. Define values, standards and goals.



Notes

9 TIME AND ENERGY MANAGEMENT

Time and Energy Management:- significance of making a time plan, energy management and fatigue, principles of work simplification, methods of saving time and energy

1. Understand the concept of time management.
2. Understand the concept of energy management.
3. Discuss the methods of saving time and energy.
4. Describe the principles of work simplification.

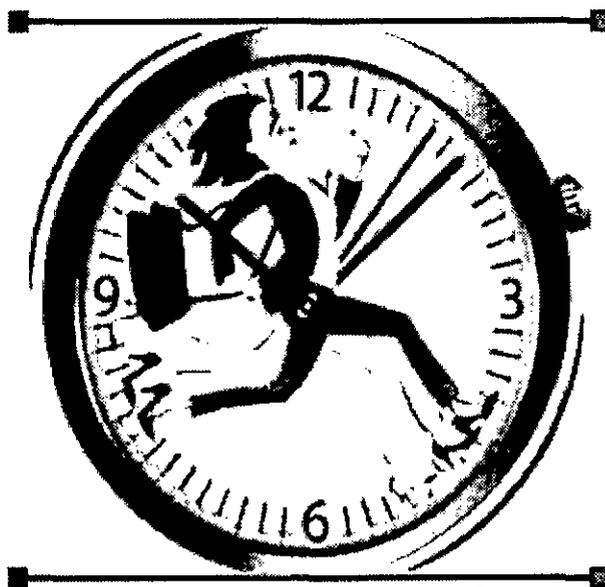
Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of time and energy management so that the methods of saving time and energy can be learned.

Time and Energy Management

Introduction

Many activities are performed throughout a day. Some of the activities like eating, cooking, exercising, sleeping, bathing and entertaining are also carried out along with work related activities but all these are to be completed within the available time that is 24 hours. If energy will not be rebuilt from time to time the work would cease. The capacity needed to perform these activities is called energy.





Notes

Energy is the capacity to do the work. It means that just as available time as a resource is limited, we also have limited amount of energy. So, we can say that within limited time we must finish all our work with our limited energy.

Time and energy are the resources available to all the individuals. These two resources are very closely interlinked. Each one affects the other. Although energy available to each one is different but the time available is equal i.e., 24 hours in a day. If the work is needed to be finished properly and on time, it is needed to make best possible use of time and energy. In other words, one must learn to manage time and energy properly.

To manage time and energy efficiently, one needs to develop the habit of making a time plan. A time plan is an advance plan of all the activities to be performed within the allotted time. A time plan can be made for a part of the day, the full day, a week, a fortnight, a month or even a year. The plan for short periods of time may be just mental, not written. When a plan is made for a long period, it is usually in the written form.

Steps involved in making a Time-Plan

Listing all the activities:List activities that have to be performed on a particular day. These can be eating, sleeping, going to school, school time and completing homework.

Grouping flexible and inflexible activities:Separate the activities into two types. Those which are flexible like going to market for shopping. The timing and day for shopping can be changed as the situation demands and can be delayed to the next day. The other set of activities are those which are inflexible, like going to school, music or dance classes. The time for performing these activities is fixed and cannot be delayed or changed.

Estimating time required for performing each activity:In the list that is prepared in step-1, allot time required for performing each activity. Going to school may take between 7 -10 minutes or 1 hour. School time may be 5-6 hours. Fill in all other works which can be done within a short time in between all the other activities with fixed activities.

Balancing:Balancing is the adjustment of time for each of the activities. This is the most difficult task. After allotting time to each of the activities, you might find that the total time required by you to do all the work is more than 24 hours. This is done by the identifying the time needed for various activities in a day and allotting the time for each activity based on their priority.

Factors that influence effective time management

Make a time schedule which can be easily followed.

Make a time schedule which is practical and flexible and can be changed easily in emergencies.

Think of an alternative plan of action for emergency.

Allow for rest and leisure time activities.

Combine activities (Dovetail) for better time utilization of time.

Energy Management

Energy management is a difficult task as the energy expenditure for various activities depends on the individual's physical and mental health. Various efforts are needed to perform different household tasks. They are mental effort, visual effort, manual effort, torsal effort and pedal



effort. During the day, different types of activities are performed requiring different amount of energy.

- i. **Heavy activities** like running, jogging and mopping requires large amount of energy.
- ii. **Moderate activities** like sweeping, ironing and cooking require average amount of energy.
- iii. **Light activities** like reading, watching T.V. and listening to music need very little energy.

Fatigue

What happens when you work for a length of time continuously? You feel like resting. This is because the capacity of your body to work has reduced, not only because you have worked very hard but also because you have not worked at all or are unable to complete a task.

Types of Fatigue

- (i) **Physiological Fatigue** - It occurs after you perform any physical activity, such as, sweeping, mopping, running or walking. After performing these activities, you feel physically tired because you have consumed all the available energy and some waste products have accumulated in the muscles. When you rest for some time, these waste products are removed from the muscles. Physiological fatigue occurs when a lot of energy is utilized for physical activities and you feel exhausted.
- (ii) **Psychological Fatigue** - You must have noticed that sometimes fatigue may occur even when you have not worked at all or after doing a little bit of work. This type of fatigue may be the result of the feeling of boredom or frustration. You feel dissatisfied and restless, experience bodily discomfort and have a desire to stop work. This type of fatigue is called psychological fatigue because you feel tired psychologically although there is no physical reason to feel tired. Psychological fatigue occurs due to the unsatisfactory work and work conditions and not due to physical exertion.

In boredom fatigue, there is discontentment, yawning, restlessness and desire to stop working. This happens because the work is monotonous and uninteresting. The working conditions are unsatisfactory or dull and the tools used are troublesome.

In frustration fatigue there is bodily discomfort, general feeling of tension, unsatisfactory results and a desire to escape from the situation. This happens because the worker is inexperienced, disturbed too often, worried, overworked and not appreciated.

Ways to Remove Fatigue

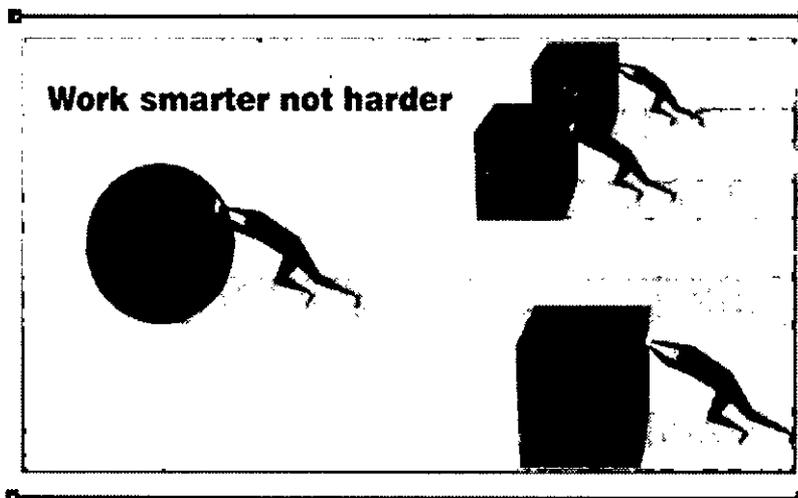
It is very easy to remove physiological fatigue. All you need to do is

- to take rest briefly.
- alternate light and heavy task
- use labour saving devices
- delegate some work to others
- make the work more interesting
- work in groups instead of alone
- have a proper work place
- have proper equipment
- develop skill at work



Notes

Work Simplification

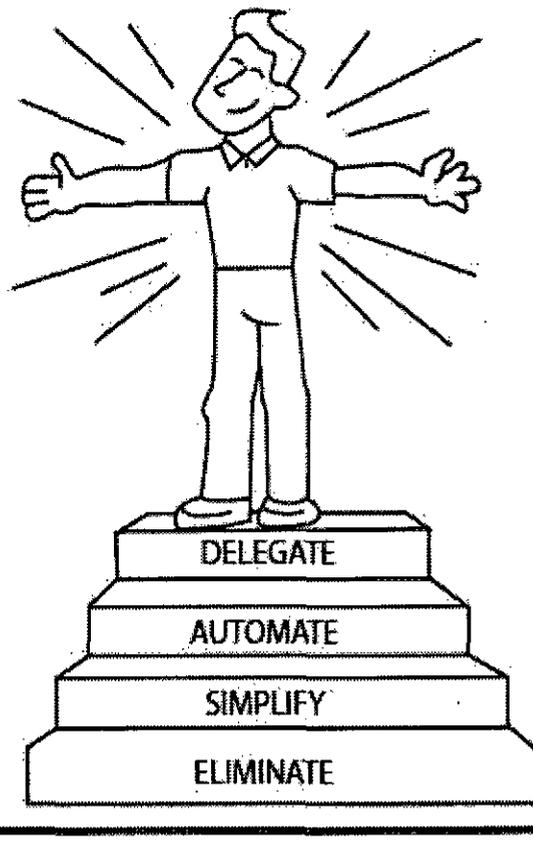


Work simplification is making work easier. According to Nickell and Dorsey (1959), "it is the conscious seeking of simplest, easiest and quickest method of doing work." It aims at accomplishing more work with limited amount of time and energy.

Home-making involves various types of activities which are most of the time tedious, monotonous, time consuming and involves various types of skill. Most of the work if done without much skill and under pressure would lead to unhappiness or frustration. To manage the house, one should know the best way of doing each household activity. To do the work easily one should know why, how, when, who and where a work should be done.

Dr. Marvin Mundel (1985) has given five factors (classes of change) that influence the character of work. They are:

1. Change in hand and body motions
 Work can be simplified by using each part of the body properly and economically.
 This can be achieved by,
 1. Keeping body parts in alignment
 2. Using muscles effectively
 3. Doing the work in rhythmic motion
 4. Developing skill in work.
2. Change in equipment and work arrangement
 Using labour saving devices, planning work surfaces at proper height, depth and width with proper tools and adequate storage space and lighting will improve the efficiency of work.
3. Change in production sequence
 When there are lot of household activities to be accomplished, time and energy can be saved by simplifying the work through combining the tasks and eliminating unnecessary steps.
4. Change in finished product
 Simplification of work could be achieved by changing the standards or expectations of the finished product. Instead of laying a dining table in a formal way, especially when the mother is working outside home, she can just keep food items on the table and members in the family can help themselves.



5. Change in material

This refers to the change in the raw ingredient to get the same final products. For example, instant Vada mix or Dosa mix can be used to prepare the same final product, at the same time requirement for pre-preparation of Vada or Dosa from raw materials can be reduced.

Methods/ Principles of Work Simplification

Let us now study about the various ways or methods of work simplification.

- (i) Keeping your work place organised: You are now aware that while working if all the required things are kept within reach and at an appropriate height you are able to finish your work by spending less of your time and energy. For example, if you are cooking you would like that all the food stuffs, utensils and source of water are near the place where you are cooking. Also, the height at which these things are kept or stored is appropriate. This means that while working you do not have to move often or stretch yourself every time you need a something. Besides this, the storage containers can also be transparent and labelled so that you do not have to hunt for the things you require.
- (ii) Using labour saving devices - Using washing machines, mixer, or a food processor for doing your work saves a lot of time and energy. You know now that if you were not using a washing machine to wash clothes you would have to do it manually. This would definitely require more energy and time. Use of a pressure cooker, peeler, chapati maker, spray gun, vacuum cleaner. etc., are some of the other examples of work simplification through use of labour having devices. If you have to Carry many things from one place to another you can save your time and energy by using either a tray or a trolley.



Notes

- Compare the number of trips required to lay a table when using both your hands and when using a tray or a trolley. Decide for yourself which is better.
- (iii) Using appropriate work movements - While doing your work if you use rhythmic movement and cut down all extra movements, you feel less tired at the end and you also save time. Some of the ways by which you can do this are: While mopping the floor, use long continuous movements instead of short, jerky and zigzag movements. Keep utensils directly for drying on the plate rack after cleaning.
- (iv) Changing the work sequence - Work can be simplified if it is performed in a proper order. For example, when you have to iron clothes it would be much quicker and easier, if you sprinkled water on all the clothes before you start ironing. If you sprinkle water on one cloth and iron it, and then on the next and so on it takes much longer. Similarly, while cooking vegetables it would be better if you put the masala on the stove and while the masala is being cooked you cut the vegetables instead of first cutting all the vegetables and then starting to cook.
- (v) Using appropriate postures - When you use the correct posture to do a Trolley for carrying things You can save time by doing all the things that can be done in the same room in one go. For example, if you are making your bed, tuck in the sheets in long strides, i.e., spread the bed sheet and bed cover and then tuck them in together instead of tucking them one after the other work you save both on time and energy. For example, if you stand and cook, you get less tired than when you sit and cook on the floor. Getting up from a sitting posture is much more tiresome than standing. Similarly pushing is always easier than pulling. • If you can work with a straight back then why work with a bent back? Keeping your back straight while working saves your time and energy. For example, use a long-handled broom instead of the regular broom to sweep the floor. While drying clothes, keep the bucket containing clothes on a stool. You will realise that you do not have to bend every time to pick up the clothes. This will keep your back straight and relieve you of the stress of frequent bending.
- (vii) Working at appropriate height - Have you noticed that you feel more tired if you have to work in a kitchen where the work surface and storage is not in accordance with your height? Why? This is because you have to bend or raise yourself while working. Which of the following methods of ironing clothes is the least tiresome for you? Sitting on the floor, bending to iron the garment placed on bed or using an ironing board? Naturally the third one, as it is the most appropriate height.
- (vi) Dovetailing - Dovetailing is the process of combining two or more activities, at the same time. This, way you can save both time and energy, e.g., after putting, water to boil for making tea, you can knead the dough, heat the milk or cut vegetables till the time the water boils. Can you suggest some more activities which can be dovetailed?
- (vii) Using ready - to consume items - Have you used ginger and garlic paste or onion powder to prepare masala instead of using fresh garlic, ginger and onion. It each time you cook? What is the advantage? Yes, you save time and energy. You can buy those from market or prepare these and keep it in your refrigerator. Pre-preparations save your time and energy when actually performing the activity. You can save still more time and energy by consuming ready-to-eat foods. You would ~ also realise that using paper plates instead of normal crockery saves time and energy.
- (viii) Attractive working place - If the work area is attractive and well organised, you tend to finish your work fast and spend less energy. This is because you enjoy working in such



an environment. This increase in efficiency is mainly because of the mental satisfaction. You can make your work place attractive by:

- keeping it clean and tidy
- using bright coloured containers and patterned crockery
- organising and storing things in their respective places
- providing ample light and ventilation

SUMMARY

Many activities are performed throughout a day. Some of the activities like eating, cooking, exercising, sleeping, bathing and entertaining are also carried out along with work related activities but all these are to be completed within the available time that is 24 hours. If energy will not be rebuilt from time to time the work would cease. The capacity needed to perform these activities is called energy. Energy is the capacity to do the work. It means that just as available time as a resource is limited, we also have limited amount of energy. So, we can say that within limited time we must finish all our work with our limited energy. Time and energy are the resources available to all the individuals. These two resources are very closely interlinked. Each one affects the other. Although energy available to each one is different but the time available is equal i.e., 24 hours in a day. If the work is needed to be finished properly and on time, it is needed to make best possible use of time and energy. In other words, one must learn to manage time and energy properly.

EXERCISE

Multiple Choice Questions

1. Indicate whether the following statements are true or false by writing 'T' or 'F' against each statement:
 - (i) To finish all our work on time, it is necessary to keep working throughout the day.
 - (ii) Knowledge about all the types of work helps in preparing a time plan.
 - (iii) A time-plan is made for the present.
 - (iv) A time-plan has to be practical and not realistic.
 - (v) A time plan is prepared to squeeze time for all work, rest and entertainment.
2. Work simplification leads to
 - (a) spending more money
 - (b) reducing work heights
 - (c) saving time and energy
 - (d) use of gadgets.
3. Dovetailing is
 - (a) finishing a job before starting the next.
 - (b) doing two or more activities at the same time.
 - (c) working at correct height.
 - (d) using a labour-saving device.

CLASS-12

Home Science



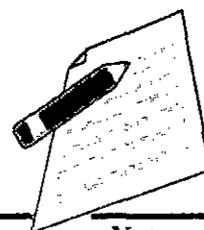
Notes

4. Correct posture helps us to
 - (a) do work on time
 - (b) get enough rest
 - (c) do two activities at the same time
 - (d) save energy while working.

(Answers:- 1 (i) F, (ii) T, (iii) F, (iv) F and (v) T. 2. (c) 3. (b) 4. (d)

Review Questions

1. What is time Management?
2. What is energy management?
3. What is fatigue? Explain its types?
4. What do you mean by work simplification?
5. Explain the process of time planning?
6. Discuss the principles of work simplification?



Notes

10 SPACE MANAGEMENT

Space Management:-meaning and need, significance of work areas, space organization for various activities

- Understand the concept of space management.
- Understand the need and significance of work areas.
- Discuss the space organization for various activities.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of space management so that the need and significance of work areas can be learned.

Space Management

Meaning and importance

You have already learnt in the previous lesson that space organisation is necessary to save time and energy. Space organisation means assigning space to an activity and systematically arranging all the materials required for it. Thus, the important aspects of space organisation are-

- allotting space for the activity
- making available on the spot all that is required for the activity
- arranging systematically all the materials and equipment required for the activity.

It is desirable that all the materials required for performing a specific task are stored nearby so that you do not waste your time and energy in collecting the materials and storing it back. Such an arrangement for storage is termed as functional storage. Also, if two or more activities need to be performed nearby then their working areas can also be organised in such a way that they can be performed simultaneously.

For example, if you want to wash utensils while the food is being cooked and the water arrangement is in the kitchen, then both the tasks can be completed simultaneously and effectively. But if water source is at a distance then unnecessary movements have to be made while doing the two jobs together, or one will have to be performed after the other. Moreover, when space in the house is limited it should be effectively utilised. For instance, a bedroom is usually used only at night for sleeping.

Therefore, it is vacant during the day when it can be used for studying purposes. Similarly, the living room can be used for sleeping at night. For this purpose, some specific arrangements need to be made to perform these additional activities effectively. You will study about this later in the lesson.

CLASS-12

Home Science



Notes

Activity areas in a home

Observe various activities that are performed in your house and make a list of all these activities. Compare it with the following list.

- Cooking
- Washing: clothes and utensils
- Sleeping
- Studying
- Playing and watching TV, listening to radio

Entertaining Most of the above activities can be broken down into sub-activities.

For example, cooking comprises of:

- storing of food stuffs
- pre-preparation, e.g., washing and cutting vegetables, kneading flour
- cooking and giving finishing touches
- washing utensils
- serving of food and storage of left over.

Therefore, the provisions required for cooking would be:

- raw materials like groceries, vegetables etc.
- utensils
- source of water
- preparation area
- cooking range, stove and fuel
- storage area
- holding area for cooked and leftover food.

Similarly, consider the activity area for washing clothes. We would need:

- provision for water
- provision of materials required for washing, such as soaps, detergents, blueing agent, starch, etc.
- bucket, mug and brush

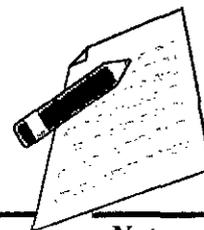
if washing machine is being used then provision of an electric point near it.

- arrangement to collect soiled clothes
- provision for clothesline and pegs or a clothes rack for drying.

In fact, all the household activities can be divided into a number of smaller sub activities. Doing this exercise of analysing each activity is important because it helps us to know the nature of the activity and work out the necessary requirements for these activities.

Work centres

Now you are well aware of the fact that each activity performed at home has specific requirements and it would be best performed if it has a working area specified for it. The area specified for an activity is known as the work area or work centre. From our earlier discussion you must have understood that by work centre it is not implied to provide a separate room for every activity.



With the space constraints in most modern houses, it is not possible to have so many rooms, so it is desirable to link two or more similar activities which can be performed in a particular room. All that you need to do is to allocate space for each of the activities in that room.

Space Organization for various activities

We will now discuss the specific requirements of some of these work centres for various household activities.

i) Cooking Area

The cooking area is usually called a kitchen where all the cooking related activities are performed. Study the kitchen in your house and judge for yourself whether the arrangements made are satisfactory or do they need some change. In the kitchen you need to store equipment and things which are required daily and those which are required less frequently. But there is a need to store everything in the kitchen. Therefore, you tend to store them at different heights depending on the need. The things that are required most often should be stored at a height most conveniently accessible to you so that you do not have to unnecessarily bend or reach high to pick up what you need. The heavier and frequently used things like atta and rice containers are usually stored at floor level to avoid lifting these containers from a height. Things used occasionally may be stored at a height above normal reach. This is called dead storage. You can observe all these storage arrangements in the Cooking Area. This arrangement of work space will depend upon whether it is a sitting or standing kitchen.

The pre-preparation area can either be inside the kitchen or some of this work can be done outside. For example, in the dining area or in the living room, while watching television, one tends to cut vegetables or pick pulses. However, proper care should be taken that after finishing the work the place is properly cleaned. After cooking, the food is served. The food can either be served in the kitchen if there is enough space or there can be a separate dining area outside the kitchen. If there is not enough space in the kitchen to keep the dining table, a folding dining table fixed in the wall can be used. Whenever required, the table can be opened and used. Further, the place in the wall behind the table can be used for storing crockery, cutlery, etc.

Utensil washing area should also be near the cooking area as far as possible because water is required at each stage of cooking - pre-preparation, preparation, serving and cleaning. If there is no regular water supply then a provision can be made for storing water in or near the kitchen.

Depending on the space available all the above provisions need to be made there. There are various layouts for kitchens in which these arrangements can be made. In these layouts, the work centres are arranged in the following ways:

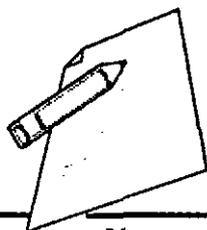
One-walled Kitchen: In small houses, such a kitchen is provided where all the arrangements for preparation, cooking, storing and washing are made on one wall only.

Two-walled Kitchen: Here two walls facing each other are used for the kitchen arrangements. **L-Shaped Kitchen:** Here two adjacent walls are used for kitchen arrangements.

U-Shaped kitchen: Here three adjoining walls are used for kitchen arrangements.

ii) Bathing Area:

The Bathroom Washing of clothes and bathing are usually done in the bathroom. Therefore, a bathroom needs storage area for soaps, washing powders, oils, other toiletries and bath



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linen. In addition, it needs to have proper water supply and drainage facility. The floor of the bathroom must have a slope leading to the main drainage point. The floor should also be non-slippery. Care should be taken to locate all electrical points in a manner that they are away from water source to prevent any accident. If a washing machine is used for washing clothes then there should be provision for keeping it in the bathroom or in an area specially assigned for washing clothes. Adequate arrangement must be made there to store soiled clothes so that you do not have to collect them from every nook and corner of your house. The area for drying the clothes, i.e., the clothesline should be near the washing area so that unnecessary movement between washing and drying area is avoided.

(iii) Sleeping Area

Sleeping area is usually allocated in the bedroom. The bedroom is meant for resting, sleeping and dressing. In addition, it can also be used for study purposes. Proper arrangement of a study table, light and space for storing books will have to be made for it. If the bedroom is small, then the beds can be so made that the children's' beds can be under the big bed and pulled out whenever required. Also, bunk beds and folding beds can be used. Or an ordinary charpoy can be used which can be moved out when it is not required. In the bedroom, the beds can have boxes or drawers which can be used for storage in place of cupboards or shelves. For easier cleaning under such beds, these can be provided with wheels. Enough space on both sides of the bed should be left in order to facilitate the making of the beds. The side tables can be used on either side of the bed for keeping small items required regularly, like table lamp, watch, books, water, etc. Instead of a dressing table, a mirror can be fixed on the wall to save space. Provision for a study table can also be made in the bedroom. It can be in the form of a proper study table or a folding table which can be opened when required. This study table can also be like the dining table fixed in the wall about which you had studied earlier. Here the wall space can be used for storing books and other stationery items. The almirah or wardrobe can be built in the wall and up to the ceiling level. It will cover less floor space and provide the needed storage space. If the sleeping area is to be provided in the living room itself, as in the case of one room apartments, then a diwan and folding beds can be provided for sleeping.

(iv) Study Area:

The study table should be placed where there is a provision for good natural and artificial lighting with least disturbance. It can be in the bedroom as discussed earlier or it can be clubbed with the dining room using the dining table for writing. A bookshelf or cabinet can be accommodated on or along the wall to keep books and stationery.

(v) Entertainment and Recreation Area

Entertainment area is where all members of the family get together, chat, watch TV, or do any similar work. This can either be in the drawing room or there can be a separate living room or a living cum bedroom. Formal entertainment should be in the drawing room. If this room is large enough, it can be divided into two parts - one for sitting purpose where sofa sets, chairs, tables, etc. can be arranged and the other for dining. The divider between the two areas can have shelves which can be used for displaying or storing various things. If the divider has the arrangements of a folding dining table in it, then the space of the room can be used as living room or children's play room. As mentioned earlier, the living room can also be converted into a guest room at night where folding beds can be spread out as per requirement. Further,



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the furniture can be so provided that the living room, can be used for sleeping at night. A sofa-cum-bed can be used as a sofa during the day and converted into a bed at night.

Concept of a one-room house

You have learnt that different rooms are used to perform various household activities. But if the house consists of just one room then all the work centres have to be adjusted in that room. Can you make a sketch to show the possible arrangement of various work centres in one room? Well, one such arrangement could be as follows.

Guidelines for making work centres more effective

Certain common guidelines can be followed for making the work centre more effective. They are: Arrange work centres in a sequential order to assist in smooth flow of work. For example, in a kitchen, the order of work centres could be pre-preparation, washing, cooking, and serving. Have transparent storage containers or keep them properly labelled. Provide adequate lighting and ventilation in all work centres. Make all work centres easy to clean and maintain. As far as possible, prefer built-in storage to storage cabinets and cupboards that occupy floor space.

Create additional storage space under the staircase, below the window slabs, and as lofts.

Relationship between space organisation and aesthetics

Whenever we are organising space for performing various activities, our aim should not only be that the center is functional but it should be attractive too. This is true for all the rooms in a house, including kitchen and bathroom. All rooms should be aesthetically appealing. If a place is appealing, you want to sit and work there. It also helps in better performance of the activity. Some of the points which can be considered for making the work centres attractive are: The size of the furniture – in accordance with the size of the work centre. Small and light furniture is desirable in a small room.

Organised look – the place looks tidy and attractive if things are stored away when not in use. The arrangement of equipment, furniture, fixtures and other things – must not hinder the movement of the people.

The arrangement of furniture and equipment in a room – in accordance with the activities performed there.

Lighting – a well-lit small room will appear bright and spacious as compared to a large poorly lit room. In a one-room apartment, all the work areas should be so arranged that they can be distinguished from each other.

Colours – can also help to improve the work centre aesthetically. For example, dark and small rooms will appear bright and big if light colours are used, and the ceiling is painted white.

Placement of suitable decorative items and indoor plants – will add appeal to the room.

SUMMARY

Space organisation means assigning space to an activity and systematically arranging all the materials required for it. Certain common guidelines can be followed for making the work centre more effective. They are: Arrange work centres in a sequential order to assist in smooth

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flow of work. For example, in a kitchen, the order of work centres could be pre-preparation, washing, cooking, and serving. Have transparent storage containers or keep them properly labelled. Provide adequate lighting and ventilation in all work centres. Make all work centres easy to clean and maintain. As far as possible, prefer built-in storage to storage cabinets and cupboards that occupy floor space. Whenever we are organising space for performing various activities, our aim should not only be that the center is functional but it should be attractive too. This is true for all the rooms in a house, including kitchen and bathroom. All rooms should be aesthetically appealing. If a place is appealing, you want to sit and work there.

EXERCISE

Review Questions

1. What do you mean by space organization?
2. Explain the space organization for the various activities of the family?
3. Explain the need of space organization?
4. Discuss the significance of work areas?
5. List two important aspects of space organisation.
6. Give any two examples other than discussed in the lesson, where two activities can be dovetailed.
7. List the provisions needed for a study area.



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11 INCOME MANAGEMENT

Income Management:-meaning of income, expenditure and investment, expenditure plan, income and expenditure record, investing money wisely, generating additional Income.

- Understand the concept of income management.
- Understand the concept of income.
- Discuss the expenditure plan.
- Discuss the ways of generating additional income.
- Discuss the methods of investing money wisely.

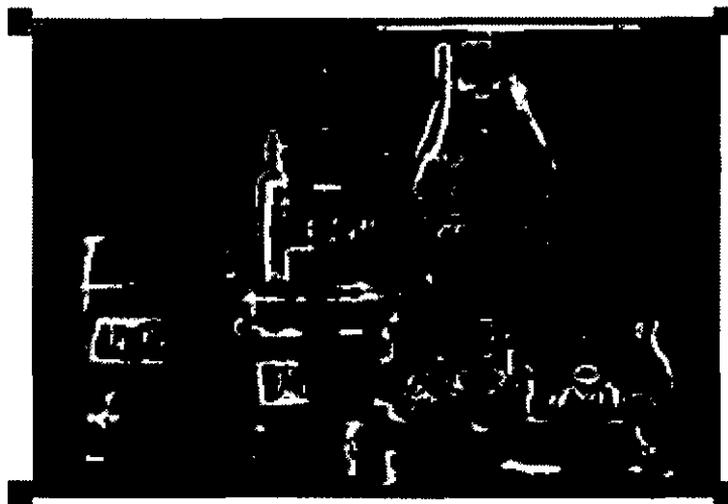
Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of income management so that the methods of investing money wisely can be learned.

Income Management

Introduction Among all the resources that are available to the family, the most important one is money. Money plays an important role in the life of man as an instrument through which he can satisfy his physical, material and mental needs. The income and expenditure pattern of the family decides the family's standard of living and its place in the society.



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Concept of Income

Income is the inflow of money, goods and services. Family income is one of the concept of income. It is defined as money or purchasing power earned by family members during a specific period of time and goods and services received or created in that time by the family e.g., goods like vegetables from kitchen garden, services like doing household chores, teaching children etc.

Family income can be classified as:

1. Money income
2. Real income
3. Psychic income

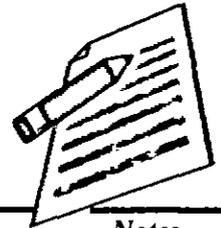
1. Money income

Money income is the cash available to a family from any source, over a period of time. The period can be daily, weekly, monthly or yearly. It is obtained in the form of a currency, bank draft or cheques.

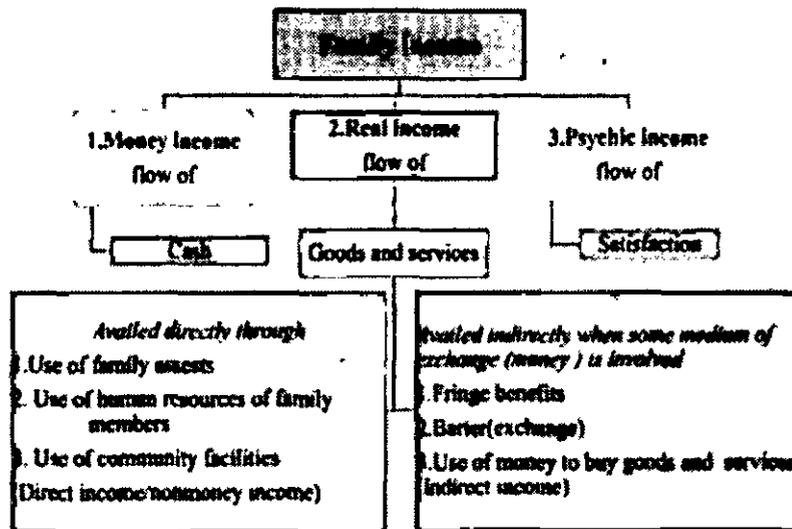
Money income is tangible and is used for purchasing goods and services for the family. The sources of money income are given below.

Sources of money income

- Salary
- Rent
- Bonus
- Profits
- Wages
- Cash gifts
- Dividends from shares
- Interest from banks
- Pension
- Investments
- Lotteries



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▲ Fig. 4 Types of family income

2. Real income

Real income is the stream of goods and services available to a family over a period of time. Real income is derived from properties and possessions owned by a family, skills, efforts and abilities of the family members and also from community facilities. These goods and services may be available to a family either directly through direct contribution of family members or by community facilities or indirectly when some medium of exchange, usually money is involved.

3. Psychic income:

It is that flow of satisfaction that arises out of everyday experiences, derived largely from use of money and real income. It is intangible, subjective and is the most important income in terms of quality of living. Psychic income depends on the skills of family members in utilizing their money and commodities judiciously. Satisfaction derived out of flowers obtained from the plants at home is an example for psychic income.

Factors Affecting Income of a Family

Several factors affect income generation such as:

- Skills and talents:** If a person has tailoring skills, they can start a boutique, while a knowledgeable home-maker can conduct bakery classes and generate income.
- Time and energy:** A person with time and adequate energy would be able to supplement his income by doing additional work.
- Interest in job:** A higher interest in the job increases efficiency which in turn helps in career advancement through promotions and results in a higher salary.
- Location of home:** Living in a remote area may lead to lesser job opportunities as compared to Cosmopolitan cities where there are more job opportunities.
- Investments/assets:** The more a person invests, the more interest can be earned. Other assets like property/ land also help in generating income through rent.



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Expenditure and Budget Management

Happiness of the family is secured by income use or expenditure. The outflow of money is called expenditure. After earning money, a family spends it on their various needs, basic necessities such as food, clothing and shelter. After their needs are fulfilled, the family desires to have comforts and luxuries, which makes the family members more comfortable. All these expenses are referred to as expenditure. Expenditure provides the satisfaction of life for the members of the family.

Factors Affecting Expenditure of a Family

Income: In low-income groups, a major portion of income is spent on food whereas in high income groups only 50% of their money is spent on food.

Family size: Expenses on food, clothing, and education is more in larger families as compared to small sized families.

Family composition: In the expanding stage of the family more money is spent on education and clothes while in the contracting stage, more expenses are incurred on medicines.

Family status: Influenced by the social circles they move in, a considerable amount of cash may be spent by some families on, maintaining a number of cars, designer clothes, entertainment, luxury items.

Type of family: In a joint family, money is saved on rent and childcare.

Family values: Some people give more value to education and prefer spending more on books. Those giving more importance to religion spend more on religious activities.

Location: There is less expense in small towns as compared to that in cities. If the school or office is nearby, less money is spent on transport.

Skill, knowledge and an interest to save: A homemaker with her knowledge, skill and interest in culinary arts can prepare exotic dishes at home and thus reduce her expenditure.

Access to community facilities: Community facilities help save expenses. A person using a library need not spend money on buying books.

Expenditure plan

It is actually a list of requirements of all the family members, with the money allocated for each item to fulfil these needs. To be able to do this you must also know the income of a family.

Why make a spending plan?

- If we do not make a spending plan, we are likely to spend more than what we have. So, if our expenditure is greater than our income it may lead us to borrow money to fulfil needs.
Expenditure > Income _____ Borrowing (> means more than)
- To avoid getting into trouble, make your spending plan and keep your expenditure less than the income, in order to save money.
Expenditure < Income _____ Saving (< means less than)

Investing money wisely

Each family has its own needs which are different from those of other families. (Even your needs as a student for books, copy, pencil pen, eraser etc. will be different from other students). How much a family spends on the different items depends on many factors.



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Let us now consider these factors

- i. **Income-** The total family income from all sources will basically help to decide how much can be spent on various items. More the income more will be the money spent for purchasing different items.
- ii **Size of family-** More the number of family members more will be the expenditure on food and clothing. Hence, the family will be able to spend less on entertainment and luxuries etc.
- iii **Age of family members-** If there are school going children, expenditure on education, school uniform, stationary etc. will be more.
- iv **Place of residence-** In big cities like Delhi and Mumbai, cost of living, food, house rent, travel expenses and school fee are higher than in small towns and villages.
- v **Skills-** If some family members have certain skills like making preserves or doing household repairs like repairing electrical equipment's, carpentry etc. then the family will have to spend less on getting the repairs done.
- vi **Savings-** Keeping in mind the future needs.

Budgeting

The common planning device for the use of money is the budget. It is a care-fully prepared spending plan based on the actual family income. It is a plan based on previous experience, present needs and future expectations. A budget is always prepared for a fixed period of time generally for a month. Budget is a guide to realistic spending aimed at avoiding over expenditure.

Importance of budgeting

- Budget acts as an intelligent guide to spending.
- It enables a family to have an overall view of their income.
- Budgeting facilitates adjusting irregular income to regular expenditure.
- Budgeting helps people to discuss their needs and set their own priorities on them.
- It helps one to cut unnecessary expenditure.
- It helps one to be free from debts.
- It helps one to live within one's income.
- It encourages conscious decision making which may help in including long term goals in the budget.
- It relieves the family members from worries of future.
- It forces one to decide what one wants most out of life.
- It provides for future saving.
- Its success depends upon its being simple, realistic, flexible and suited to the family or individual for whom it is made.

The List of Budget Items

It is necessary to list the chief budget items to make sure that each item is attended to in the expenditure plan while portioning the income. Each family may have their own way of listing the items.



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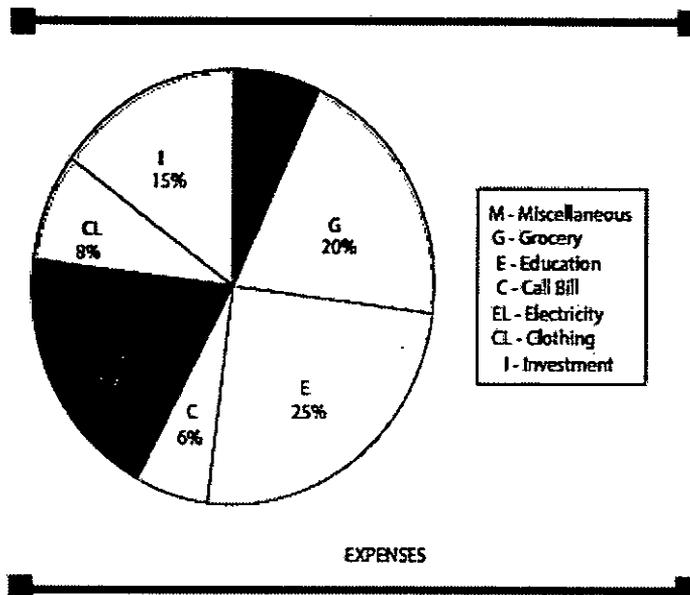
Steps in preparing the budget for a family are given below.

STEP	
01	List commodities and services needed by the family members throughout the budget period.
02	Estimate the cost of desired items. Total each classification for budget estimation. Past records are helpful.
03	Estimate and total expected income from all sources for the budget period.
04	Set aside a definite sum as emergency fund as well as for goal oriented savings and insurance.
05	Bring expected income and expenditure in balance.
06	Check the plan if it is realistic.

▲ Fig. 5 Steps in preparing budget

The chief budget items include:

- i. Food
- ii. Clothing
- iii. Housing
- iv. Education
- v. Transport
- vi. Personal Expenses (Sundries)
- vii. Household Expenses
- viii. Savings



Income and expenditure record

Use the following steps to make your spending plan :

1. Keep in mind all the income and facilities available to you for the period for which you are making the spending plan.
2. List all the requirements (commodities and services) needed by the family members for that period.
3. Prioritize these needs.
4. Allocate funds keeping in mind the total income. This will help in effective utilization of money and other resources.
5. Balance the spending plan. This will also help to save some money.

Second step is listing all the requirements (main category). All families have their own spending plan according to their needs.

When your spending plan is ready and you have balanced it also. The last step is keeping records of all the expenditure. Why should you maintain a record of expenditure?

Yes, this will help you to-

- know how much you have spent on each item
- know whether you have spent more or less on certain items than the previous month
- control any unnecessary expenditure by not spending money on these items
- plan for future needs
- save money
- check or compare old prices with new prices
- avoid getting cheated

Money from the present income that is collected and put aside for future consumption is known as **savings**. Savings of a month is the difference between the income and expenditure of that month. Families should make sure that they save by cutting down their wasteful expenditures. The following figure shows the importance of savings and various institutions for savings and guidelines for selection of those institutions.

1. Bank Accounts
 - Savings Account
 - Current Account
2. Post office
 - Savings Account
 - Recurring Deposit Scheme
 - Post Office Time Deposit Scheme
3. Provident Fund
 - General Provident Fund
 - Contributory Provident Fund
4. Life Insurance Scheme
 - LIC (Whole Life Policy)
 - Medical Insurance Scheme
 - Endowment Policy

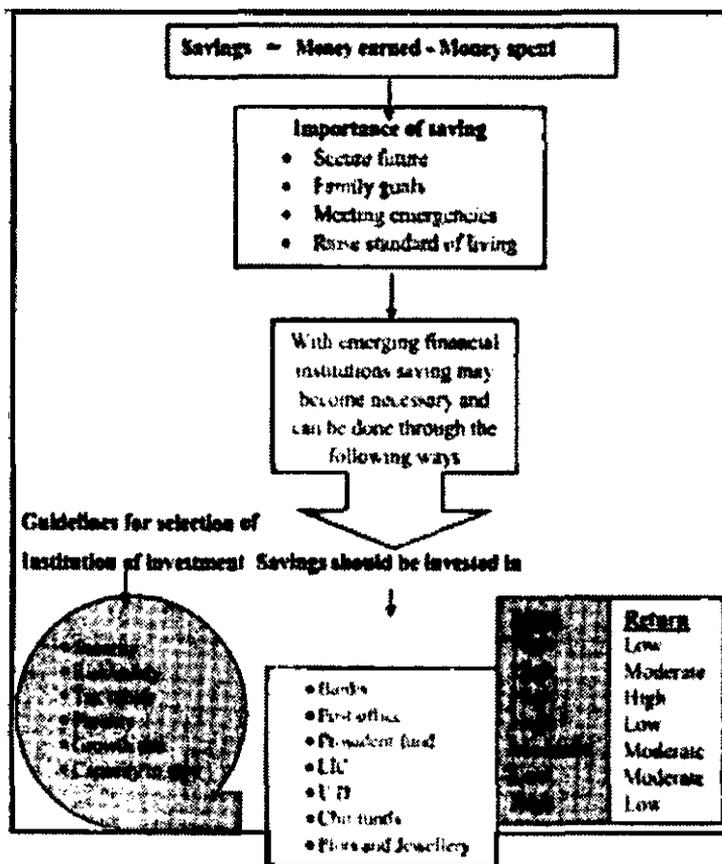




5. Units of Unit Trust of India
6. Shares and debentures
7. Bonds
8. Chit Funds
9. Real Estate
10. Gold, Silver Jewellery's

Generating additional income

When the savings are made to grow, it is called investment. There are various avenues of investment. They are:



▲ Fig. 6 Importance of Savings and Institution

Banks

An investor deposits his savings in a bank account which earns him a nominal rate of interest. Besides banking, the banks offer a series of diverse financial services such as loans, credit cards, ATMs (Automatic Teller Machines). With the computerization and networking of some of the banks, their services have become faster and customers can operate their account from any of its branches. This is called core banking. These are the main accounts used for depositing money in a bank.



1. Savings Account
- An individual can open this account either singly or jointly. The minimum balance amount required in an account with nationalized banks is ₹ 500/- and ₹ 1000/-* with cheque book facility. This amount may vary in private banks.
 - The deposit can be made as and when the investor desires. Withdrawals are done with the help of cheques or withdrawal slips. A passbook is also provided for the record of deposits (credits) and withdrawals (debits).
 - Advantages of paying through cheques: Cheques are considered safe method because
 - 1) Cheques are deposited directly into the payee's account.
 - 2) Currency is not handled directly by either the payer or the payee.
 - 3) Cheques are an unquestionable proof of having paid or received a payment.

2. Current Account
- This account is suitable for business persons who would like to keep their money in safe custody and withdraw or make payments as and when required.
 - There is no limit to the number of withdrawals. A person can withdraw his money any number of times.
 - No interest is paid in this account.
 - The bank charges for the services of keeping the money safe and offering it whenever required.

3. Fixed Deposit Account
- A certain amount of money is deposited in the bank for a fixed period.
 - The interest rate varies with the period of investment. The interest rate is higher than that of the ordinary savings account.
 - After the stipulated period, the principal amount and the total interest is paid to the investor.
 - An investment up to 1 lakh for 5 years qualifies for tax rebate.

4. Recurring Deposit
- This is an ideal form of savings for those having salaried income with a view to inculcate a regular saving habit.
 - A fixed amount of money (core money) is deposited every month (only once, between 1st -10th). At the end of the term the amount is paid.

Post Office

Post offices are situated in every locality and are found even in remote areas. There are various post office schemes, each having its distinct advantages.

1. Post Office Saving Accounts
- For opening of new account the introduction of depositor is necessary by a responsible person.
 - This is simple account involving a minimum deposit of ₹ 50/-
 - A cheque book facility is available; subject to a minimum balance of ₹ 500/-* in the account.
 - Maximum amount allowed in a single account is 1 lakh * and 2 lakh in a joint account. However, there is no limit for group/institutional account.
 - The rate of interest is 4 %* per annum.

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2. Post Office Recurring Deposit Scheme	<ul style="list-style-type: none">• Any individual (a single adult or two adults jointly) can open an account.• Minimum: Rs.10/- and multiples of Rs.5/- thereafter. Maximum: No limit.• Maturity period: 5 years.• Rate of interest 7.1% per annum with effect from 01.07.2017• One withdrawal up to 50% of the balance allowed after one year.• Premature closure allowed after three years.• Interest earned is deductible under Section 80L of I.T. Act.
3. National Saving Certificate	<ul style="list-style-type: none">• These can be purchased by an adult for himself or on behalf of a minor, jointly by two adults, a minor and a trust.• Certificates in denominations of ₹ 100/-, 500/-, 1000/-, 5000/-, and 10,000/- may be purchased from any post office, either directly or through authorised agents.• Minimum ₹ 100/- can be invested. There is no limit on amount of investment.• Period of maturity is 6 years.• Interest rate is 7.8%* per annum, (w.e.f 01-07-2017).• Deposit qualifies for tax rebate.• Premature withdrawals are not allowed.• Certificates can be kept as collateral security to get loan from banks.

Provident fund

1. General Provident Fund	<ul style="list-style-type: none">• It is compulsory only for government employees.• 10% of basic salary is contributed in the provident fund.• The employee can take loan from this fund and can return the loan in easy instalments every month, deducted from his/her salary.• At the time of retirement, the person gets this money in lump sum and pension.• Get tax rebate on amount invested.• Rate of interest is 8.5%.
2. Contributory Provident Fund	<ul style="list-style-type: none">• This is compulsory for private and semi-private company employees.• In this both employee and the employer contribute certain percentage of money. On retirement, the employee gets his/her part of contribution in a lump sum but he/she gets employers' contribution in instalments as pension.• Eligible for tax rebate.
3. Public Provident Fund	<ul style="list-style-type: none">• This is a statutory scheme of central government framed under the provisions of the Public Provident Fund Act, 1968. Such account can be opened in any Head Post Office, any branch of the State Bank of India and selected branches of other Nationalized Banks.• This is a 15 year scheme and the rate of interest is 8.8%• Only one Public Provident Fund account can be opened by any adult in his/her names or as guardian of a minor.• Invested amount can be minimum ₹ 500/- and maximum ₹ 1, 00,000/- in a financial year. The financial year starts from year ending 31st March.



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Insurance

Insurance is provided by private as well as government institutions. Life Insurance Corporation is provided by government of India. It is a means of providing against loss caused by natural or man-made factors. It is the most popular method of securing the future.

LIC has a variety of schemes to choose from. These schemes cater to all categories of people and to their diverse needs. Some of the popular schemes are given below:

1. New Money Back Plan- (20 years)	<ul style="list-style-type: none"> • This is a participating non-linked plan which offers an attractive combination of protection against death throughout the term of the plan. • Also there is periodic payment on survival at specified durations during the term.
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- This unique combination provides financial support for the family of the deceased policyholder any time before maturity and lump sum amount at the time of maturity for the surviving policyholders.
- This plan also takes care of liquidity needs through its loan facility.
- In case of Life Assured surviving to the end of the specified durations 20% of the Basic Sum Assured at the end of each of 5th, 10th and 15th policy year.
- In case of Life Assured surviving the stipulated date of maturity, 40% of the Basic Sum Assured along with vested Simple Reversionary Bonuses and Final Additional Bonus, if any, shall be payable.

2. Term Policy- Anmoljeevan and Amulyajeevan - II	<ul style="list-style-type: none"> • These are a protection plan which provides financial protection to the insured's family in case of his/her unfortunate demise. • Death Benefit: In case of unfortunate death of the life assured during the policy term Sum Assured shall be payable. • On survival to the end of the policy term, nothing shall be payable.
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3. Medical Insurance	<ul style="list-style-type: none"> • One year temporary medical assurance is provided to the insured. • This policy needs to be bought every year. • It has the benefit of 100% tax rebate and provides insurance cover for any hospitalization, major operation or illness. Some concession is given if the scheme is purchased for the whole family.
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Shares

Shares are a fractional part of the capital of a company. When a company wants to develop, they float shares to the public. When a person buys shares, she becomes part owner of the company. She will then share both profit and loss of the company. The profits are called dividends.

- A person can get high rate of interest, if the company is making profits.
- Dividends are tax-free.
- There is a risk of losing money, in case the company goes in a loss.
- Investor may not be able to find a suitable buyer for his/her shares or may not get a good price.

Debentures

A debenture is an instrument of debt. Debenture holder is a creditor to the company who loans funds to the company for a period of time against a fixed rate of interest.

*Notes*

Units

Mutual fund is a public and private sector financial institution which offers various schemes for attracting investments from public. It issues units to the investors (unit holders) and invests the collected amount in securities. Each unit is of Rs 10/-.

Profit and losses are shared by the investors in proportion to their investment. Mutual fund is required to be registered under SEBI (Securities Board of India), before it can collect funds from public. SEBI protects the interest of investors and regulates the securities market.

- Open end fund-scheme is available for subscription and repurchase on a continuous basis. These do not have a stipulated maturity date.
- Close end fund- these schemes have a stipulated maturity period. Fund is open for subscription only for a specified period of time.
- Investors have an option to sell back the units to mutual fund at the NAV (Net Asset Value) market value of assets.
- Tax rebate is available under some schemes such as ULIP (Unit Linked Insurance Plan and Pension Plans).
- There is no limit on investment in some schemes.
- Units can be pledged as security for loans.
- Unit holders can switch from close end to open end schemes.
- Some schemes may have high risk and high rate of interest. On the other hand, some schemes have fixed rate of interest but no risk.
- Dividends are tax free.

Bonds

Bonds are also debentures which are issued by government or Government Company. On liquidation (closing) of the company, the creditor is secured.

Chit Funds

This is an easy and simple device where a group of people join as committee and agree to contribute a fixed sum every month. Chits are taken out once every month. Chits are taken out once every month. The promoter gets the first collection and after that, whosoever gets his name on the chit drawn, gets the money.

SUMMARY

Among all the resources that are available to the family, the most important one is money. Money plays an important role in the life of man as an instrument through which he can satisfy his physical, material and mental needs. The income and expenditure pattern of the family decides the family's standard of living and its place in the society. The common planning device for the use of money is the budget. It is a care-fully prepared spending plan based on the actual family income. It is a plan based on previous experience, present needs and future expectations. A budget is always prepared for a fixed period of time generally for a month. Budget is a guide to realistic spending aimed at avoiding over expenditure. Money from the present income that is collected and put aside for future consumption is known as savings. Savings of a month is the difference between the income and expenditure of that month.



Notes

Families should make sure that they save by cutting down their wasteful expenditures. The following figure shows the importance of savings and various institutions for savings and guidelines for selection of those institutions.

EXERCISE

Multiple Choice Questions

Choose the correct option from the choices given to complete the statement.

1. Income means
 - i. money
 - ii. house
 - iii. furniture
 - iv. all the above.
2. Family income means
 - i. income of all related persons living in the household
 - ii. commodities and services produced in the country
 - iii. right to consume goods and services
 - iv. all the above.
3. Write T for true and F for false in the space provided before each statement. If false, write the correct answer in the line given below each question.
 - a. Budget is the process of allocating income among various uses.

 - b. Family goals affect the budget.

 - c. A budget forces you to decide what is more important than the other.

 - d. A budget can't help in achieving long term goals.

 - e. Budgeting helps in the management of your finance.

 - f. The main purpose of a budget is to allow you to live within your income.

 - g. Income of the family member does not influence the budget.

 - h. Making a budget helps in saving money.

 - i. Major amount from the income is spent on food.

Answers:— 1. iv 2. i 3. a. True b. True c. True d. False - A budget can help in achieving long term goals e. True f. True g. False - Income of family members influence the budget h. True



Notes

Review Questions

1. Discuss with your parents and list all the sources of your family income.
2. List the skills of all your family members. Give them suggestions as to how they can contribute to family income by making use of their skills. Ask them to make some products for sale.
3. Define any two of the following:
 - a. Money Income
 - b. Direct and Indirect Income
 - c. Budget
4. Give any five points highlighting the importance of 'Family Spending Plan'.
5. List the characteristics of a good budget.
6. Define the term "spending plan" and explain the factors on which the allocation of money on different items is decided.



Notes

12 ENERGY CONSERVATION

Energy Conservation: meaning and need, environmental degradation, role of individuals and government in creating an eco-friendly environment.

- Understand the concept of energy conservatism.
- Understand the concept of environmental degradation.
- Discuss the role of individuals and government in creating an eco-friendly environment.

Objective of the chapter:

The basic objective of this chapter is to throw some light on the initial concepts of energy conservation so that the role of individuals and government in creating an eco-friendly environment can be learned.

Energy Conservatism

Introduction

Energy can be defined as the capacity to do work. Energy can manifest itself in many forms like mechanical energy, thermal energy, electric energy, chemical energy, light energy, nuclear energy, etc.

The energy possessed by a body due to its position or due to its motion is called mechanical energy.

The mechanical energy of a body consists of potential energy and kinetic energy.

Potential energy

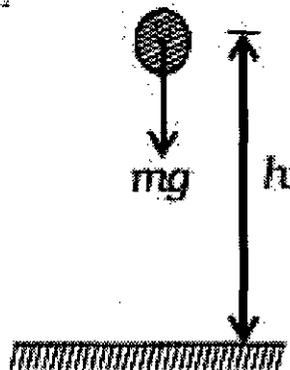


Fig.
Potential energy



Notes

The potential energy of a body is the energy stored in the body by virtue of its position or the state of strain. Hence water stored in a reservoir, a wound spring, compressed air, stretched rubber chord, etc, possess potential energy.

Potential energy is given by the amount of work done by the force acting on the body, when the body moves from its given position to some other position.

Expression for the potential energy

Let us consider a body of mass m , which is at rest at a height h above the ground as shown in Fig. The work done in raising the body from the ground to the height h is stored in the body as its potential energy and when the body falls to the ground, the same amount of work can be got back from it. Now, in order to lift the body vertically up, a force mg equal to the weight of the body should be applied.

When the body is taken vertically up through a height h , then work done, $W = \text{Force} \times \text{displacement}$

$$\square W = mg \times h$$

This work done is stored as potential energy in the body

$$\square EP = mgh$$

Kinetic energy

The kinetic energy of a body is the energy possessed by the body by virtue of its motion. It is measured by the amount of work that the body can perform against the impressed forces before it comes to rest. A falling body, a bullet fired from a rifle, a swinging pendulum, etc. possess kinetic energy.

A body is capable of doing work if it moves, but in the process of doing work its velocity gradually decreases. The amount of work that can be done depends both on the magnitude of the velocity and the mass of the body. A heavy bullet will penetrate a wooden plank deeper than a light bullet of equal size moving with equal velocity.

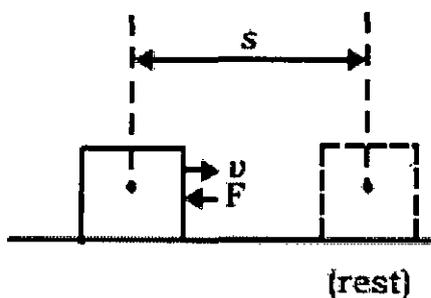
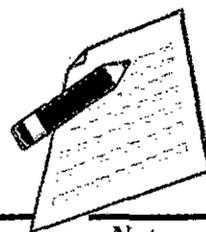


Fig. Kinetic energy

Expression for Kinetic energy

Let us consider a body of mass m moving with a velocity v in a straight line as shown in Fig. Suppose that it is acted upon by a constant force F resisting its motion, which produces retardation (decrease in acceleration is known as retardation). Then

$$F = \text{mass} \times \text{retardation} = - ma \dots\dots(1)$$



Notes

Let dx be the displacement of the body before it comes to rest.

But the retardation is

$$a = \frac{dv}{dt} = \frac{dv}{dx} \times \frac{dx}{dt} = \frac{dv}{dx} \times v \quad \dots(2)$$

where $\frac{dx}{dt} = v$ is the velocity of the body

$$\text{Substituting equation (2) in (1), } F = -mv \frac{dv}{dx} \quad \dots(3)$$

Hence the work done in bringing the body to rest is given by,

$$W = \int F \cdot dx = - \int_v^0 mv \cdot \frac{dv}{dx} \cdot dx = -m \int_v^0 v dv \quad \dots(4)$$

$$W = -m \left[\frac{v^2}{2} \right]_v^0 = \frac{1}{2} mv^2$$

This work done is equal to kinetic energy of the body.

Kinetic energy $E_k = \frac{1}{2} mv^2$

Need of Energy Conservatism

Environmental degradation

Environmental degradation is the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems; habitat destruction; the extinction of wildlife; and pollution. It is defined as any change or disturbance to the environment perceived to be deleterious or undesirable. As indicated by the I=PAT equation, environmental impact (I) or degradation is caused by the combination of an already very large and increasing human population (P), continually increasing economic growth or per capita affluence (A), and the application of resource-depleting and polluting technology (T).

Environmental degradation is one of the ten threats officially cautioned by the High-level Panel on Threats, Challenges and Change of the United Nations. The United Nations International Strategy for Disaster Reduction defines environmental degradation as «the reduction of the capacity of the environment to meet social and ecological objectives, and needs». Environmental degradation comes in many types. When natural habitats are destroyed or natural resources are depleted, the environment is degraded. Efforts to counteract this problem include environmental protection and environmental resources management.

Environmental issues can be seen by long term ecological effects, some of which can demolish whole environments. An environment is a unique unit and incorporates all the living and non-living components that live inside it. Plants and creatures are evident parts of the environment, but it also includes the things on which they depend on, for example, streams, lakes, and soils.

Environmental surroundings get to be divided when technological advancement splits up areas of land. Some examples of this can include streets which may slice through woods or even trails which wind through prairies. While it may not sound all terrible on the surface, there are bad results. The biggest of these results are felt by some particular animal and plant groups, the vast majority of which are specific for their bio-region or need a large area in order to make sure that their genetic lines are kept intact.



Notes

Types of Environmental Degradation

Land and soil degradation: Degradation of soil quality from poor farming practices, excessive use of fertilizers and pesticides, leakage from landfills etc.

Water degradation: Pollution of water from trash dumped in oceans, illegal dumping, disposal of large amounts of industrial waste into nearby rivers or lakes etc.

Atmospheric degradation: This includes air degradation, particle pollution and the depletion of the ozone layer.

Several other kinds of pollution: Apart from land, water and atmospheric degradation, many other kinds of pollution such as noise pollution, light pollution that are part of environmental degradation.

Causes of Environmental Degradation

Some environmental life species require substantial areas to help provide food, living space, and other different assets. These creatures are called area specific.

At the point when the biome is divided, the vast patches of living space don't exist anymore. It becomes more troublesome for the wildlife to get the assets they need in order to survive. The environment goes on, even though the animals and plantlife are not there to help sustain it properly.

1. Land Disturbance

A more basic cause of environmental degradation is land damage. Numerous weedy plant species, for example, garlic & mustard, are both foreign and obtrusive.

A rupture in the environmental surroundings provides for them a chance to start growing and spreading. These plants can assume control over nature, eliminating the local greenery.

The result is a territory with a solitary predominant plant which doesn't give satisfactory food assets to all the environmental life. Thus, the whole environment can be destroyed because of these invasive species.

2. Pollution

Pollution, in whatever form, whether it is air, water, land or noise is harmful to the environment. Air pollution pollutes the air that we breathe, which causes health issues.

Water pollution degrades the quality of water that we use for drinking purposes. Land pollution results in the degradation of the earth's surface as a result of human activities. Noise pollution can cause irreparable damage to our ears when exposed to continuous large sounds like honking of vehicles on a busy road or machines producing large noise in a factory or a mill.

3. Overpopulation

Rapid population growth puts strain on natural resources, which results in the degradation of our environment. Mortality rate has gone down due to better medical facilities, which has resulted in an increased lifespan.

More population simply means more demand for food, clothes and shelter. You need more space to grow food and provide homes to millions of people. This results in deforestation, which is another factor in environmental degradation.



Notes

4. Landfills

Landfills pollute the environment and destroy the beauty of the city. Landfills come within the city due to the large amount of waste that gets generated by households, industries, factories and hospitals. Landfills pose a great risk to the health of the environment and the people who live there. Landfills produce a foul smell when burned and cause substantial environmental degradation.

5. Deforestation

Deforestation is the cutting down of trees to make way for more homes and industries. Rapid growth in population and urban sprawl are two of the major causes of deforestation.

Apart from that, the use of forest land for agriculture, animal grazing, harvest for fuel wood and logging are some of the other causes of deforestation. Deforestation contributes to global warming as decreased forest size puts carbon back into the environment.

6. Natural Causes

Things like avalanches, quakes, tidal waves, storms, and wildfires can totally crush nearby animal and plant groups to the point where they can no longer survive in those areas.

This can either come to fruition through physical demolition as the result of a specific disaster or by the long-term degradation of assets by the presentation of an obtrusive foreign species to the environment. The latter frequently happens after tidal waves, when reptiles and bugs are washed ashore.

Of course, humans aren't totally to blame for this whole thing. Earth itself causes ecological issues, as well. While environmental degradation is most normally connected with the things that people do, the truth of the matter is that the environment is always changing. With or without the effect of human exercises, a few biological systems degrade to the point where they can't help the life that is supposed to live there.

Effects of Environmental Degradation

1. Impact on Human Health

Human health might be at the receiving end as a result of environmental degradation. Areas exposed to toxic air pollutants can cause respiratory problems like pneumonia and asthma. Millions of people are known to have died due to the indirect effects of air pollution.

2. Loss of Biodiversity

Biodiversity is important for maintaining the balance of the ecosystem in the form of combating pollution, restoring nutrients, protecting water sources and stabilizing climate. Deforestation, global warming, overpopulation and pollution are a few of the major causes of loss of biodiversity.

3. Ozone Layer Depletion

The ozone layer is responsible for protecting the earth from harmful ultraviolet rays. The presence of chlorofluorocarbons, hydrochlorofluorocarbons in the atmosphere, is causing the ozone layer to deplete. As it will deplete, it will emit harmful radiation back to the earth.



4. Loss for the Tourism Industry

The deterioration of the environment can be a huge setback for the tourism industry that relies on tourists for their daily livelihood. Environmental damage in the form of loss of green cover, loss of biodiversity, huge landfills, increased air and water pollution can be a big turn off for most of the tourists.

5. Economic Impact

The huge cost that a country may have to borne due to environmental degradation can have a significant economic impact in terms of restoration of green cover, cleaning up of landfills and protection of endangered species. The economic impact can also be in terms of the loss of the tourism industry.

Solutions to Environmental Degradation

1. Stop Deforestation

In order to mitigate the adverse effects of environmental degradation, stopping deforestation is crucial for our environmental system. We cannot afford to cut or burn trees down as trees store greenhouse gases, produce oxygen and are the natural habitat for many animals and plants, which may become endangered if these forests are destroyed.

An extensive afforestation campaign should be launched in the interest of environmental protection. We can further make a positive impact through reforestation or afforestation.

2. Government Regulations

Governments require intervening and setting a framework whenever there are problems that lead to significant eco-degradation. Governments set high taxes for activities that harm our planet and support environmentally-friendly behaviour with financial subsidies.

These will also force industries and private people to avoid activities that lead to environmental degradation.

3. Fines and Punishment for Illegal dumping

There should also be high fines for illegal dumping to reduce the adverse ecological consequences. People and industries will continue to dump their trash illegally as they know that even if they get caught, penalties are quite low.

Therefore, raising fines for illegal dumping would increase the incentive to dispose of trash at official waste disposal sites.

4. Reduce Consumption Levels

It has become essential to reduce our consumption levels. Our developed society always strives for the latest electronics, smart phones, and the trendiest clothes and so on.

However, this behaviour leads to huge resource depletion and excessive production of waste. We have to lower our consumption levels significantly to avoid the adverse ecological consequences.



Notes

5. Reuse and Reduce Waste Generation

You can reduce waste production by using your items and food more efficiently. If you want to get rid of old but still working things, be creative to give it a new look or use it in another way.

By doing so, your material things will be used more effectively. If they cannot be put to use anymore, separate them and give them for recycling.

6. Avoid Plastic

Plastic waste is a big environmental problem that leads to significant plastic pollution and the degradation of our planet. In order to cut down plastic waste, avoid buying items with plastic wrapper or packaging, refrain from using disposable plastic bags, cups, plates, containers, cutlery, etc. Instead, bring your own reusable stuff, which can be reused several times.

7. Education

It is highly essential that children should know about the adverse environmental consequences of our daily life behaviour and the ways we can improve our ecological footprint.

This education should start early in school. Children are usually more eager to learn new things and change their behaviour compared to adults.

These children are more likely to act in an environmentally-friendly manner when they grow up, and they might also convince their parents to behave in a more ecologically friendly way.

8. Convince Others

You can further enhance your positive impact by convincing other people regarding the importance of behaving in an environmentally way. Tell them what environmental degradation really means for future generations and how changing small things in our daily life can prevent these adverse effects.

As you can see, there are a lot of things that can have an effect on the environment. If we are not careful, we can contribute to the environmental degradation that is occurring all around the world.

Role of individuals and government in creating an eco-friendly environment

Here are four practical ways to be environmentally friendly in your municipality:

1. Encourage Environmentally Friendly Employee Practices

Coach all employees to be conscious of saving energy. Encourage employees to turn off lights in rooms that aren't in use, such as storerooms, restrooms and break rooms.

Instruct employees to turn off computers, printers and power strips at the end of the workday. Ask employees to delay turning lights and office equipment back on the next day until they really need to use them. Make sure that monitors are set on the most energy-efficient settings and eliminate screensavers on computers.



Notes

2. Making Environmentally Friendly Changes in Local Government Facilities

Replace incandescent bulbs with fluorescent or LED bulbs. Rearrange office furniture and add window coverings that allow for as much natural sunlight to flood the workspace as possible.

Your break room or lunchroom is a good place to start. Replace paper and plastic ware with reusable dishes that employees can wash rather than throw away. Add some recycling bins as a visible reminder to recycle. Request vending machine servicers to fill machines with healthy drinks and snacks, such as fruit juices, granola, fruit and pretzels. Provide a water cooler to reduce the collection of plastic water bottles in the office. Healthier eating leads to a healthier lifestyle, and local governments are bound to reap the rewards with employees who take fewer sick days.

To reduce paper use, set printers to print on both sides. For the times when paper use can't be avoided, opt for recycled paper. In addition, check out other eco-friendly office supplies, such as refillable ink cartridges and non-toxic highlighter pens.

3. Foster Clean Commute Initiatives

Local government employees often live right in town. Rather than encouraging staff to drive to work by themselves, foster discussions about transportation options such as walking or biking. Perhaps employees might want to ride-share or to take public transportation. Up the ante by offering a "clean commuting" award for employees who practice clean commuting for a specified period of time.

4. Software Solutions Help to Reduce the Local Government Carbon Footprint

Establishing local environmental, social and governance (ESG) criteria, where focus changes region by region, has become a priority for many local governments, but the hallmarks of carbon reduction remain consistent across locales. Think about taking the office as paperless as possible. Compass, a Diligent brand, makes this possible with board management software that enables efficiency in creating board agendas and meeting minutes while eliminating paper use completely. The program helps local governments to drastically cut down on excessive ink and paper costs when compiling board meeting books. Last-minute changes are no problem, as public officials can access the latest changes online in real time.

Store an unlimited number of important records using secure cloud-based storage. Reduce paper from Freedom of Information Act (FOIA) requests with a Transparency Portal where citizens can retrieve public documents electronically.

SUMMARY

Energy can be defined as the capacity to do work. Energy can manifest itself in many forms like mechanical energy, thermal energy, electric energy, chemical energy, light energy, nuclear energy, etc. The energy possessed by a body due to its position or due to its motion is called mechanical energy. The mechanical energy of a body consists of potential energy and kinetic energy. Establishing local environmental, social and governance (ESG) criteria, where focus changes region by region, has become a priority for many local governments, but the hallmarks of carbon reduction remain consistent across locales. Think about taking

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Notes

EXERCISE

Review Questions

1. What do you mean by energy?
2. What is potential energy?
3. What is kinetic energy?
4. What is environmental degradation?
5. What is energy conservatism?
6. Explain the causes of environmental degradation?
7. Discuss the ways to make environment eco-friendly?



Notes



ENVIRONMENT MANAGEMENT

Environment Management: Meaning and need of Environment, Effect of environment, Role of individual and government in creating an eco-friendly environment.

- Understand the concept of environment management.
- Understand the need of environment.
- Discuss the effect of environment
- Discuss the role of individuals and government in creating an eco-friendly environment.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of environment management so that the role of individuals and government in creating an eco-friendly environment can be learned.

Environment Management

Introduction

Environmental management is “a purposeful activity with the goal to maintain and improve the state of an environmental resource affected by human activities.

Definition of Environmental Management:

Environmental Management can be defined as “the management of the interaction and impact of human activities on the natural environment”.

Environmental management further aims to ensure that ecosystem services and biodiversity are protected and maintained for equitable use by future human generations, and also, maintain ecosystem integrity as an end in itself by taking into consideration ethical, economic, and scientific (ecological) variables. Environmental management tries to identify the factors that have a stake in the conflicts that may rise between meeting the needs but protecting the environment.

Identification: Via complaints/concerns from the community we identify a certain environmental problem

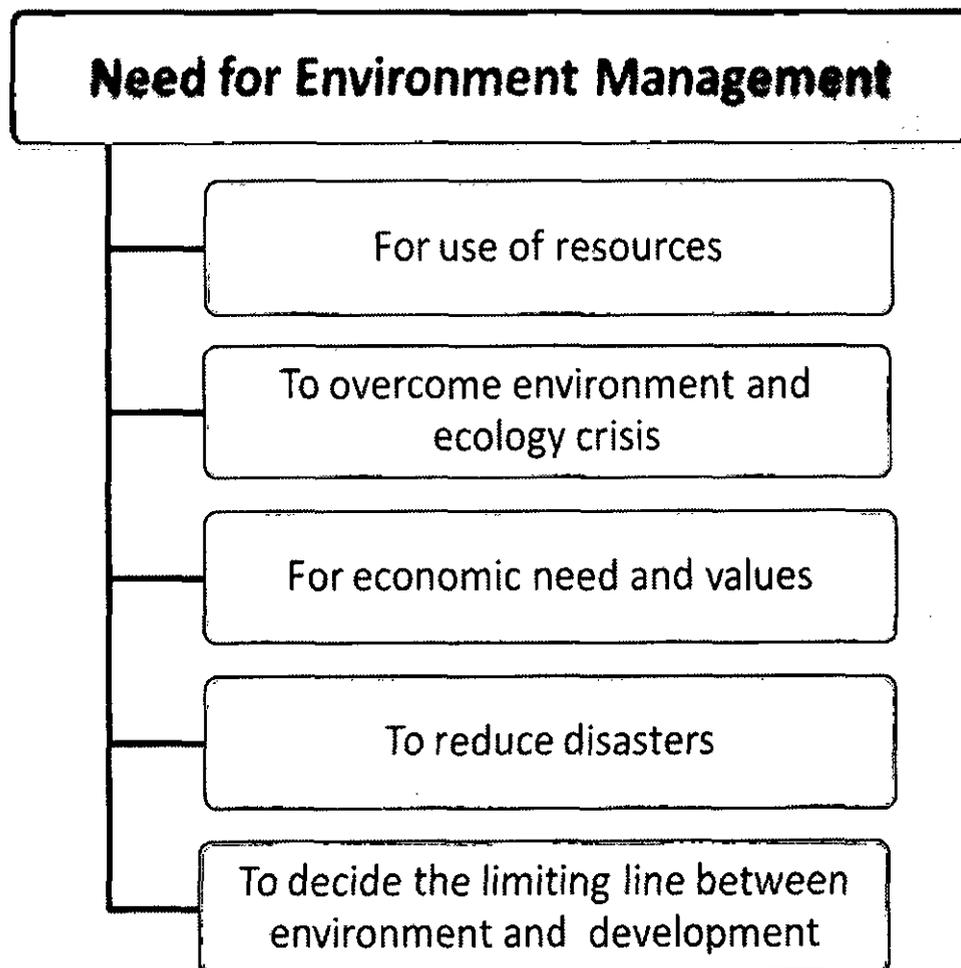
Evaluation: Inspections with relevant Government Departments (Provincial and National) we determine the extent of the problem

Control: The problem is brought to the attention of the transgressor/polluter and the person/company who is informed to stop the illegal activity and address the problem or concerns which include the rehabilitation of the area(s).

Need for Environment Management

Need to study environment management is an important perspective in the current scenario. Environmental stress is becoming severe day by day. Degradation of environment poses a serious threat to humanity.

Need to study environment management is depicted in the following image.



- For use of resources
- To overcome environment and ecology crisis
- For sustainable development
- For economic need and values
- To reduce disasters
- To decide the limiting line between environment and development

Need for environmental management vis-a-vis development are follows:

1. For use of resources

Resources are limited, if we don't use them properly, they will get exhausted very soon. For appropriate and reasonable use of resources, environment management is necessary. It is our basic responsibly to create an accurate coordination and equilibrium between our needs and procedure of environment.





2. To overcome environment and ecology crisis

Environment management is the need of the hour. The present development has reached a point where environment and ecology are in crucial crisis, if the same has to continue, then it will create a disastrous effect on the environment. The whole earth will be destroyed.

3. For sustainable development

Environmental management is required for development without destruction or overuse of natural resources and to reduce pollution and degradation of nature. Considering the welfare of future generations, proper decisions regarding use of environment are necessary.

4. For economic need and values

Environmental Management is required to give new directions to our economic needs and values, at the same time to maintain clean environment.

5. To reduce disasters

Environmental Management reduces the risk of disasters like flooding, forest fire, earthquakes, desertification, transport accidents, Global warming, etc. We need to explore the link between environmental system and disasters and also the synergies between man-made and natural disasters.

6. To decide the limiting line between environment and development

Environmental Management is essential to draw a line of limit for development and environment. For E.g. If our development needs to lead to global warming or depletion of the ozone layer, then we must not use the materials, and modify our way of development. We may adopt the policy of afforestation.

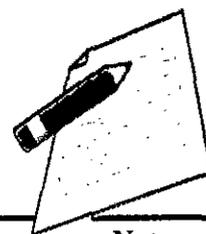
Thus, environmental management is necessary.

Environment

Environment, the complex of physical, chemical, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.

The Earth's environment is treated in a number of articles. The major components of the physical environment are atmosphere, climate, continental landform, hydrosphere, and ocean. The relationship between the principal systems and components of the environment, and the major ecosystems of the Earth are treated in the article biosphere. The significant environmental changes that have occurred during Earth's history are surveyed in the article geochronology. The pollution of the environment and the conservation of its natural resources are treated in the article conservation. Hazards to life in the biosphere are discussed in the articles death, disease, and immune system.

Environment can roughly be defined as "the sum total of all conditions and influences that affect the life and development of organisms. Life originated and flourishes on earth because of the environment. Every organism influences its environment and in turn gets influenced by it. We are an integral part of the environment.



Effect of Environment

Among all living organisms man influences environment the most and can also modify the environment to some extent as per his needs. Changes in environment affects us. Man has been influencing the environment since the beginning of human civilization through his activities.

Rapid population growth, industrialization, faster modes of transport, urbanization and increasing human activities has contributed to the pollution of environment. Environmental pollution has several impacts on society. Environmental pollution causes serious problems like global warming, depletion of ozone layer, extinction of biodiversity etc. Large scale degradation of the environment not only causes pollution but may jeopardize the very existence of human society.

There is no end to human needs. Desire to develop is one of the basic needs of human beings. To satisfy his increasing needs and to develop man has been exploiting nature vigorously which led to serious environmental degradation and pollution. This may have the following impact on society.

1. Environmental pollution resulted in increase of temperature of atmosphere which resulted in global warming.
2. Air pollution resulted in depletion of ozone layer which causes multiple health hazards.
3. It may lead to acid rain and smog.
4. It spreads different kinds of diseases in society.
5. It affects the fertility of soil and resulted in food shortage.
6. Environmental pollution is a formidable threat to the quality of life and put a check on development process.
7. It fosters environmental awareness among different sections of society.
8. It leads to climate change which affects production and life style.
9. It disturbs terrestrial ecosystems.
10. It led to frequent occurrence of environmental disaster and there by brings changes in society.
11. It puts renewed emphasis on non-conventional energy sources.
12. It creates need for proper planning and efficient environmental management.
13. Economic development is replaced by sustainable development.
14. It creates need for conservation or protection of environment for a healthy living.
15. It creates need for compensating afforestation on the patita or non-forest lands.

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Store an unlimited number of important records using secure cloud-based storage. Reduce paper from Freedom of Information Act (FOIA) requests with a Transparency Portal where citizens can retrieve public documents electronically.

SUMMARY

Environmental management is "a purposeful activity with the goal to maintain and improve the state of an environmental resource affected by human activities. Environmental Management can be defined as "the management of the interaction and impact of human activities on the natural environment". Environmental management further aims to ensure that ecosystem services and biodiversity are protected and maintained for equitable use by future human generations, and also, maintain ecosystem integrity as an end in itself by taking into consideration ethical, economic, and scientific (ecological) variables. Environmental management tries to identify the



Notes

14 ENVIRONMENT MANAGEMENT

Household Equipment: selection and use, care and maintenance.

- Understand the concept of household equipment.
- Understand the need of selection and use of household equipment.
- Discuss the care and maintenance of household equipment.

Objective of the chapter:

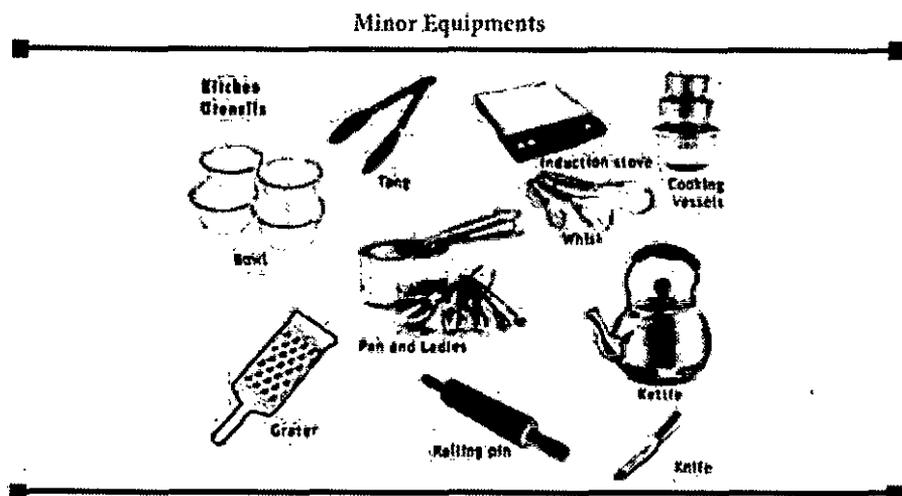
The basic objective of this chapter is to through some light on the initial concepts of household equipment so that the methods of care and maintenance of household equipment can be learned.

Selection and use of Household Equipment

Introduction

Knowing the names and uses of equipment is as important as knowing where to find them in a kitchen.

Minor Equipment: The small equipment that we use in the kitchen for food are known as minor equipment.



Measuring equipment

- dry measuring cups for solid ingredients liquid measuring cup with space at top
- spatula to level off dry ingredients



Notes

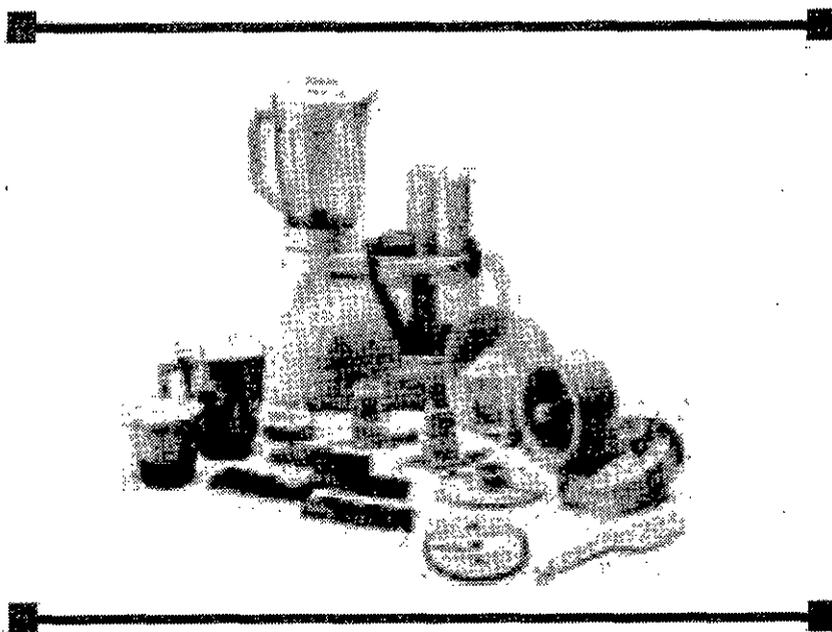
Slicing and Cutting Tools

- paring knife cleans/peels fruits and vegetables utility knife for all cutting purposes
- butcher knife-heavy duty for large cuts of meat bread knife has serrated edge
- chef s knife/French knife for slice, dice, chop a triangle blade slicing knife has a long narrow blade used for meat and cabbage carving knife for meat
- peeler for peeling fruits and vegetables
- kitchen shears
- cutting board
- grater
- mixing tools
- baking tools
- cooking tools
- kitchen aids
- cookware
- cleaning equipment

The minor kitchen equipment is used mostly for pre-preparation of foods.

Major Equipment: The major kitchen equipment that are used for everyday cooking would include a food processor (mixer cum grinder/blender), refrigerator, microwave oven and even a small non-commercial oven cum toaster and grill.

Food processor (mixer)



Oven Cum Toaster and Grill

These major equipment are very essential for daily use.

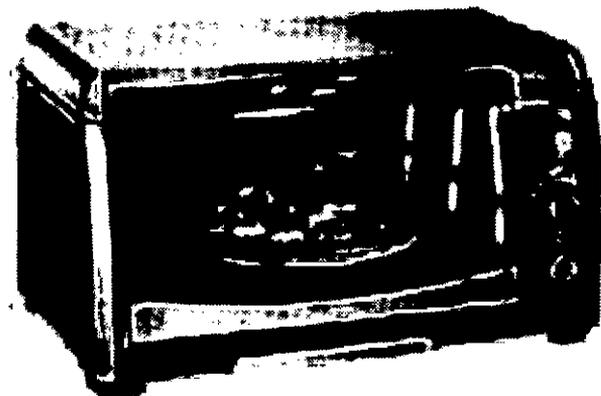
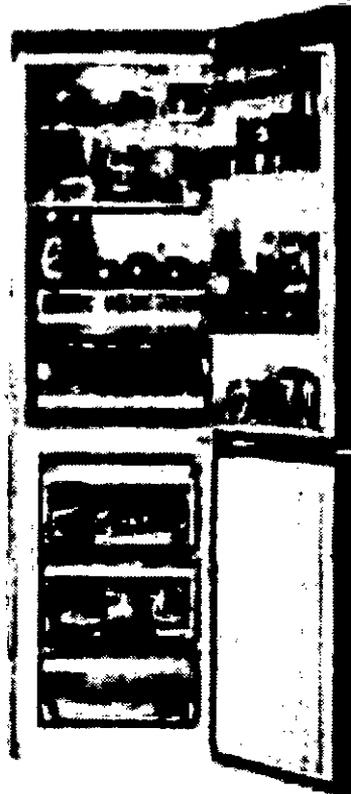
The refrigerator is used for storing food and keeping it fresh free from spoilage. These foods include vegetables, fruits, eggs, milk and milk products and leftover cooked food also.



Notes

The freezer helps to store and preserve foods, especially raw food items like non-vegetarian foods such as fish, meat and chicken and their products at a much lower temperature (at zero degrees centigrade and below).

Refrigerator





Care and Maintenance

Cooking is fun, but kitchen safety is a priority. There are many types of equipment in the kitchen and environmental hazards that can be extremely dangerous. Sharp objects like knives, open fire by the oven, electrical appliances, and even bacteria around the kitchen.

Observing basic rules of kitchen safety is a good habit to develop. To prevent serious injuries or accidents: always pay attention to what you're doing, adopt a plan for kitchen cleanliness, and have necessary safety equipment at your disposal.

- Store knives in a wooden block or in a drawer
- Never cook with loose clothes on and keep long hair tied back.
- Never cook while wearing dangling jewellery
- Keep pot holders nearby and use them
- Turn pot handles away from the front of the stove.
- Don't let temperature-sensitive foods sit out in the kitchen.
- Wipe up spills immediately.
- Separate raw meat and poultry from other items whenever you use or store them.
- Wash your hands before handling food and after handling meat or poultry.
- Get a fire extinguisher for the kitchen.

Follow these steps to keep cuts clean and prevent infections and scars.

Wash your hands: First, wash up with soap and water so you don't get bacteria into the cut and cause an infection. If you're on the go, use hand sanitizer.

Stop the bleeding: Put pressure on the cut with a gauze pad or clean cloth. Keep the pressure on for a few minutes.

Clean the wound: Once you've stopped the bleeding, rinse the cut under cool running water or use a saline wound wash. Clean the area around the wound with soap and a wet washcloth. Don't get soap in the cut, because it can irritate the skin. And don't use hydrogen peroxide or iodine, which could irritate the cut.

Remove any dirt or debris: Use a pair of tweezers cleaned with alcohol to gently pick out any dirt, gravel, glass, or other material in the cut.

Generally, a good antiseptic cream (silverex or burnol) should be kept handy. It is advisable to have a small first aid kit readily available in the kitchen.

SUMMARY

Knowing the names and uses of equipment is as important as knowing where to find them in a kitchen. The small equipment that we use in the kitchen for food are known as minor equipment. These major equipment are very essential for daily use. The refrigerator is used for storing food and keeping it fresh free from spoilage. These foods include vegetables, fruits, eggs, milk and milk products and leftover cooked food also. The freezer helps to store and preserve foods, especially raw food items like non-vegetarian foods such as fish, meat and chicken and their products at a much lower temperature (at zero degrees centigrade and below). Cooking is fun, but kitchen safety is a priority. There are many types of equipment in the kitchen and environmental hazards that can be extremely dangerous. Sharp objects like knives, open fire by the oven, electrical appliances, and even bacteria around the kitchen.



Notes

Observing basic rules of kitchen safety is a good habit to develop. To prevent serious injuries or accidents: always pay attention to what you're doing, adopt a plan for kitchen cleanliness, and have necessary safety equipment at your disposal.

EXERCISE

Review Questions

1. What do you mean by kitchen equipment?
2. Discuss the ways to keep kitchen equipment in safe condition?
3. Discuss the selection and use of household equipment?
4. Explain the types of household equipment?

15

CONSUMER EDUCATION



Notes

Consumer Education: definition, problems faced by consumers, consumer protection laws and redressal, role of standardization marks, labelling and packaging, consumer rights and Responsibilities.

- Understand the concept of consumer education.
- Understand the consumer protection laws and redressal.
- Discuss the consumer rights and Responsibilities.
- Understand the role of standardization marks, labelling and packaging.
- Discuss the problems faced by consumers.

Objective of the chapter:

The basic objective of this chapter is to throw some light on the initial concepts of consumer education so that the rights and responsibilities of consumers can be learned.

Consumer Education**Introduction**

What is consumer education? Consumer education is a right that protects the consumer from large companies that sell products and services. According to the consumer rights bill that was established during President John F. Kennedy's term, consumers have the right to know more about the products that they purchase. In addition, consumers have the right to be protected from malicious acts. Consumer education provides resources and information that inform the consumer of such things as price and trade practices. Consumer education involves three parts: Consumer, Business, and Government.

Consumers

Consumer education is pivotal within the buying society. Consumers are informed on how to make better buying decisions that directly affect the functioning of the economy. Consumer education has become more relevant due to the rapid growth of products in the market. Consumers need to stay informed on the effects of the economy in order to make the best decisions.

It was important that consumers were educated and given information by the government, media, and businesses. Consumers needed to know how businesses were doing in order to determine how to invest their money and they also needed to know where to look for employment.



Notes

Major problems faced by consumers

Let us now look at some of the major problems faced by consumers.

1. **Substandard/poor quality goods:** Various manufacturers can make the same product such as large multinational corporations, local Indian manufacturers and some may be imported from other countries. However, the material used may be different and the product quality may also vary, making it difficult for a consumer to identify a poor-quality product. Many consumers are ignorant about quality standards.
2. **Adulteration:** Adulteration may be intentional or unintentional. A substance is said to be adulterated when some substances are either added to or removed from a product. Consequently, the composition, nature or quality is altered. Adulteration is a serious problem not only because it is exploitative but because it can cause harm to health and safety of the consumer.
3. **High Prices:** Every consumer expects that s/he will be charged a fair price for a product. However, we must bear in mind that prices are influenced by government policy, availability, quality, delivery system, market location, method of distribution, costs of promotion, method of purchase and consumer's desire for convenience. Despite this, some consumers tend to relate price to quality of an item, though it is not necessary. Prices of same quality goods may vary because of high/low cost of production, overhead expenses, advertising etc. Some suppliers may overcharge when they find that the customer is not well informed and lacks knowledge.
4. **Lack of Consumer Information:** Most consumers are unaware of their rights and responsibilities and do not know the various legislative provisions that have been made to protect them.
5. **Inadequate or Erroneous Information given by Manufacturer:** This includes: Labels of most products are not factually correct; some are deceptive and misleading. Most labels fail to give complete essential information and often use terminologies which a common consumer is unable to understand. Advertisements are not informative and are limited in their ability to answer many essential questions about qualities or uses of the product. Seldom advertisements do focus on features, care and maintenance, after sales service, etc. There is a lack of buying guides on consumer durables and nondurables to aid the consumer in decision-making.
Packaging is being used as a potent marketing tool. Attractive packages persuade consumers to make impulsive purchases. At times the container used for packing products is larger than the contents. Many a times several layers of expensive packing material is used. Manufacturers repackage existing products into attractive looking and novel shapes of packs and advertise the product to be "in a new pack", although the product quality is the same. However, the consumer is enticed by the new packing.
6. **Incorrect Weights and Measures:** The consumer sometimes ends up getting less quantity than what he pays for due to incorrect weights and measures. This is because either the weights and scales are altered by the retailers or correct measures are incorrectly used. Measures are often deceptive and exploit consumers of their money. Weights and measures without seal or verification stamp are not genuine.
7. **Spurious /Duplicate/ Imitation Products:** Consumers are confused and cheated by spurious and substandard products, duplicates of well-known brands, some having similar packaging, colour scheme and similar sounding brand names. Often such imitations are of poor quality and may be injurious and unsafe to use.



8. **Sales Promotion Schemes to Entice the Consumer:** Indian market is flooded with a plethora of products. Companies, national as well as multinational, are competing with one another to capture larger market share. To do so, they come out with several sales promotion schemes like exchange offers, bonus, lucky draws etc. Such means of sales promotion are not always genuine and deceive the consumer. Consumers tend to get swayed by these enticing sales promotion gimmicks and fall prey to them.

Consumer Protection Laws and Redressal

The Consumer Protection Act is landmark legislation in the interest of the consumer. The main function of this Act is to protect consumers from fraudulent trade practices prevalent in the market place and provide redressal to them for their grievances. It is based on the principle of self-help and protects consumer against all kinds of exploitation and unfair dealing. It intends to provide simple, speedy and inexpensive redressal to consumers for their grievances.

The Act has two implications:

First, it gives the consumer the right to complain to an authority about his/ her grievances and seek speedy redressal.

Secondly, consumer can claim compensation for any loss or injury suffered on account of the negligence of the manufacturer. It applies to all goods and services unless otherwise expressly notified by the central government. The Act has made the consumer movement powerful, broad based, effective and people oriented.

Apart from statutory, semi-government and non-government bodies looking after consumer interests like Bureau of Indian Standards (BIS) and Directorate of Marketing and Inspection (DMI), Government of India, there are Protection Councils set up by the government at central and state levels. Non-governmental organisations (NGO's)/voluntary consumer organisations play an important role in consumer education and protection due to their non-partisan interests. They also disseminate information through their magazines, booklets, newsletters, buying guides, audio visual material and research reports. Many consumer organisations are engaged in comparative testing of products, creating consumer awareness about harmful and unsafe products, product recalls, disseminating information about new legislative provisions for consumers, legal advice and advocacy, handling consumer grievances and complaints and acting as vigilance groups. They hold public meetings and have libraries and documentation centres, and play an important role in consumer awareness, empowerment and consumer movement. In India we have several consumer organisations bringing out publications in the interest of the consumer. VOICE, a Delhi based consumer organisation, brings out 'Consumer Voice', CERC, an Ahmedabad based consumer organisation, brings out 'Insight'. Similarly, the Consumers Union in the US brings out 'Consumer Reports'; Consumer Association in UK brings out 'Which' and the Australian Consumers Association brings out 'Choice'.

Role of standardization marks, labelling and packaging

Another mechanism of consumer protection is through standardisation marks. Consumers must purchase products with standardisation mark to ensure the quality/purity of the product. It is important for the consumer to know about different standard marks and the products covered under them. Standardisation is a prime requisite for attaining quality.

Let us learn more about these standard marks. ISI Mark : This is the certification mark of Bureau of Indian Standards (BIS), earlier called the Indian Standards Institution (ISI). Under

*Notes*

this scheme, licences are issued to manufacturers whose goods meet the relevant standards. Indian standards cover food items such as vegetables, fruits and meat products, spices and condiments, processed foods, cereal and soya products, candies and beverages etc.

Other products covered by with the BIS standards include electrical goods, soaps, detergents, paints, paper etc. Among the various items covered under the scheme, some are under mandatory certification.

AGMARK and Fruit Product Order (FPO) : These standards have been promulgated by the Government of India. These certificates specifically pertain to food products. A consumer should look for AGMARK seal before purchasing any agricultural product as it ensures product reliability. FPO lays down statutory minimum standards in respect of quality of various fruits and vegetable products, and processing facilities. FPO also lays limits on metallic contaminants and preservatives for different fruit products.

Wool-mark: Wool-mark is the standard mark of quality of the International Wool Secretariat for wool or woollen garments. It indicates that the wool is pure and the marked garment is not made of other fibres but only pure wool.

The Silk Mark : is a quality assurance label for the assurance of pure silk and in addition serves as a brand for generic promotion of pure silk. Silk Mark ensures '100% natural silk'.
Hallmark : It indicates that the precious metals such as platinum, silver and gold articles have been evaluated and tested at an official Assaying and Hallmarking Centre and they have certified that the metal used conforms to the national/international standard of fineness/purity.

Consumer Rights and responsibilities

In order to effectively deal with the onslaught of clever and deceptive market interests, marketing strategies and other problems, consumers need to be aware and educated about their rights, responsibilities and protection mechanisms.

Consumer Education and Protection are thus tools which empower and equip consumers to protect themselves from adverse market forces. In addition, they help the consumers understand legislation and policy matters which would directly have a bearing on their rights and choices as consumers.

The Government of India has accepted, established and enshrined six consumer rights under the Consumer Protection Act (CPA) 1986.

There are four basic rights-

- (i) right to safety,
- (ii) right to be informed,
- (iii) right to choose and
- (iv) right to be heard.

Two additional rights are right to redressal and right to education.

Consumer rights are those rights, which are or should be provided legally to protect consumer interests. In other words, these are rights designed to ensure that all consumers obtain goods and services of reasonable quality, at fair prices. Let us briefly examine what the six rights under the Consumer Protection Act cover:

1. **Right to Safety:** This refers to the right to be protected against hazardous effect that may be caused to the health/life of a consumer. This right specifies that the consumer has the right to be protected against products, production processes and services which are hazardous to health or life.

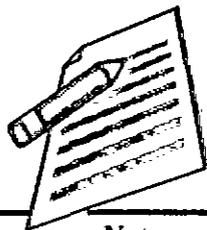


2. **Right to be Informed:** This means the right to be informed about the quality, quantity, potency, purity, standard and price of goods and services, so as to protect the consumers against unfair trade practices.
3. **Right to Choose:** This implies that every buyer has the right to have access to products of varying quality and quantities, prices, size and design, at competitive prices, and to choose according to his needs and wants.
4. **Right to be heard:** The right to be heard means that consumers' interests will receive due consideration at appropriate forums. It also includes the right to be represented in various forums that are working to ensure consumer welfare. To enable consumers to exercise this right, both the state and voluntary agencies are expected to provide such forums.
5. **Right to seek redressal:** Every consumer has the right to seek redressal against unfair trade practices or unscrupulous exploitation. It also includes the right to fair settlement of genuine grievances. It involves the right to receive compensation for faulty goods and services.
6. **Right to Consumer Education:** This refers to every person's right to acquire knowledge and skill to be an informed consumer, so that s/he will be able to make wise decisions while purchasing goods and hiring services. This right implies that the consumer should be educated enough to be able to solve the problem himself.

Every human being has not only rights but also responsibilities. You may have heard some people speak of 'rights and responsibilities', clearly indicating that both go hand in hand. Thus, in order to be able to exercise one's right it is necessary to be aware of one's duty. As consumers therefore, we need to be aware of our responsibilities.

Consumer responsibilities are:

1. Consumers should have responsibility towards regularly updating their knowledge of various laws and legislative provisions made by the government.
2. Consumers should be honest in all their dealings and must pay for all their purchases.
3. Before making a purchase, consumers should do a market survey to find out the different brands, features etc. of items available in different shops and different markets and should compare the prices. This will help them make a wise choice.
4. Consumers should feel free to choose from the variety available as per their needs and requirements.
5. While making a purchase, s/he should read all the information given on the label/ brochure.
6. To be assured of quality he should buy products with standardisation marks.
7. Consumer should keep receipts and other relevant documents of purchase. These may be needed as proof of purchase for filing complaints in case of problems/defective/malfunctioning products.
8. In case of purchase of services like insurance, credit cards, bank deposits etc., s/he should read and understand all terms and conditions, liabilities, service charges etc. and make an effort to get the representative to clarify points that are not clearly written.
9. S/he must have increasing awareness about various national and international consumer organisations in terms of their activities, work and understand the benefits of becoming a member of such organisations.



Notes

SUMMARY

Consumer education is a right that protects the consumer from large companies that sell products and services. According to the consumer rights bill that was established during President John F. Kennedy's term, consumers have the right to know more about the products that they purchase. In addition, consumers have the right to be protected from malicious acts. Consumer education provides resources and information that inform the consumer of such things as price and trade practices. Consumer education involves three parts: Consumer, Business, and Government. Consumer education is pivotal within the buying society. Consumers are informed on how to make better buying decisions that directly affect the functioning of the economy. Consumer education has become more relevant due to the rapid growth of products in the market. Consumers need to stay informed on the effects of the economy in order to make the best decisions. It was important that consumers were educated and given information by the government, media, and businesses. Consumers needed to know how businesses were doing in order to determine how to invest their money and they also needed to know where to look for employment.

Activity 1 Interview five people in your locality and find out the consumer problems faced by them. Find out what actions they took to solve those problems. Make a list of problems faced and actions taken, and discuss in the class.

Activity 2 Divide the class into two groups. Group A will deal with consumer rights and Group B with consumer responsibilities. Group A: Talk to three people in your locality and find out the extent of their knowledge about consumer rights. Group B: Talk to three people in your locality and find out awareness about consumer responsibilities among them. Discuss your findings in the class and suggest what can be done to increase awareness about consumer rights.

EXERCISE

Review Questions

1. Explain the following terms in 2-3 lines:

a. Consumer	b. Consumer rights
c. Consumer responsibilities	d. Consumer Protection Act
e. Consumer problems	
2. List the following:

a. Any three consumer rights	b. Any three consumer responsibilities
c. Any five consumer problems	d. Any three standardisation marks
3. State true or false:
 - a. ISI mark is given by BIS.
 - b. Agmark is meant for agricultural products.
 - c. Right to safety is not a consumer right.
 - d. VOICE is the name of a consumer organisation.
4. Discuss in brief the basic concepts of consumer education and protection.
5. Explain the rights and responsibilities of consumer?
6. Discuss the consumer protection act?



Notes

16 CONSUMER EDUCATION

Growth and Development (0-5 years): definition and principles of development, development during infancy and childhood, physical, motor, socio emotional, cognitive and language development, behaviour problems in Children.

- Understand the concept of development.
- Understand the development during infancy and childhood.
- Discuss the principles of development.
- Understand the language development.
- Discuss the behaviour problems in Children.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of development so that the behaviour problems in Children can be learned.

Growth and Development

Introduction

The study of human development can be traced back to the 18th century. The first effort towards the study of the child based on direct observations were initiated by Darwin (1809-82) and Preyer (1841-97). They maintained careful notes on the development and behaviour of individual children over a period of years. Stanley Hall (1844-1924) in United States of America, and Alfred Binet (1857- 1911) in France carried out scientific investigation to under-stand the causes of human behaviour.





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Hall studied the concepts of children and published his finding in the book "The content of Children's mind" in 1883. The first intelligence scale was published in 1905 by Binet. A discipline of science called "Human Development" emerged in the twentieth century in order to understand the patterns of development from conception to the period of old age.

Growth: It is defined as physical changes in body size, structure, bodily dimensions and increase in magnitude, muscular strength and organs.

Development: It is a progressive series of changes in an orderly, coherent pattern whereby an individual adapts to their environment. Development includes physical characteristics (height, weight), intellectual functions (creativity, performance of intelligence) and social characteristics (independence, aggressiveness).

Maturation: It is development of the organism as a function of time or age; it refers to neurophysiological and biochemical changes such as the time a child's teeth erupts, the child's developing ability to talk, walk etc.

Learning and Experience: It is any relatively permanent changes in thought, feeling and behaviour caused by interaction with the environment.

Maturation and Learning Interrelation: Learning and maturation cannot be isolated from each other. Development is the result of interaction of maturation and learning. This is clear in motor development especially in postural responses, loco-motion and manipulation. In summary, development is a multifaceted and complex process, involving gains and losses, growth and aging and more are brought about by both maturation and learning.

Stages of Development

Physical Development: It includes the growth of the body and its organs during childhood, the appearance of physical signs of aging during adulthood, and the gains and losses in motor abilities that occur over the years.

Motor Development: Motor development refers to the development of a child's bones, muscles and ability to move around and manipulate his or her environment. Motor development can be divided into two sections: gross motor development and fine motor development.

- Gross motor development involves the movement of the large muscles in the child's body. This movement including sitting, walking, running and climbing stairs.
- Fine motor development are those that involve the small movements of the fingers and hands. They include picking up objects, using cups, knives and forks, pouring drinks, dressing, holding and using pencils, pens, scissors and keyboards.

Social Development: Social development refers to the process by which a child learns to interact with others around them.

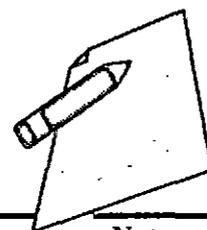
Emotional Development: It refers to the ability to recognize, express, and manage feelings at different stages of life how and why they happen and to have empathy for the feelings of others.

Cognitive Development: Cognitive development involves changes and stability in mental processes.

Language Development: Language development is the use of arbitrary symbols in an orderly fashion to communicate verbally and individual's wants and needs.

Principles of Development

The domains are interrelated; what happens in one domain influences development in the other domains. The skills and knowledge that children develop early in his life are the foundation for more advanced skills and knowledge.



Notes

Each child develops at his or her own rate. Regular developmental screening is a way to help parents and professionals like doctors, nurses, child care providers and teachers gather information about children's development, identify possible concerns, and make referrals for help when needed.

Children develop in a predictable order, from simple to more complex skills. They learn by doing, and practice new skills through play. Play is a critical opportunity for children to practice new skills.

Many factors influence child development: heredity, family, and community. Children's early experiences will affect them now and in the future. Children must have their basic needs met, feel safe, and feel valued in order to develop and learn.

Understanding children's development at different ages makes it easier for parents and caregivers to:

- know what to expect of children
- learn what to do to help a child develop all of his or her abilities

Learning Styles and Differences

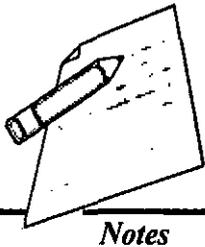
Different children have different personalities, and likewise, children have different intelligences and learning styles-some are visual-spatial learners, some auditory learners, some kinesthetic learners, and some a combination. By understanding your child's learning personality, you can tailor his environment or teach him tips to help him succeed in school and in life. Children are not naughty but adult needs to understand them !

Infancy

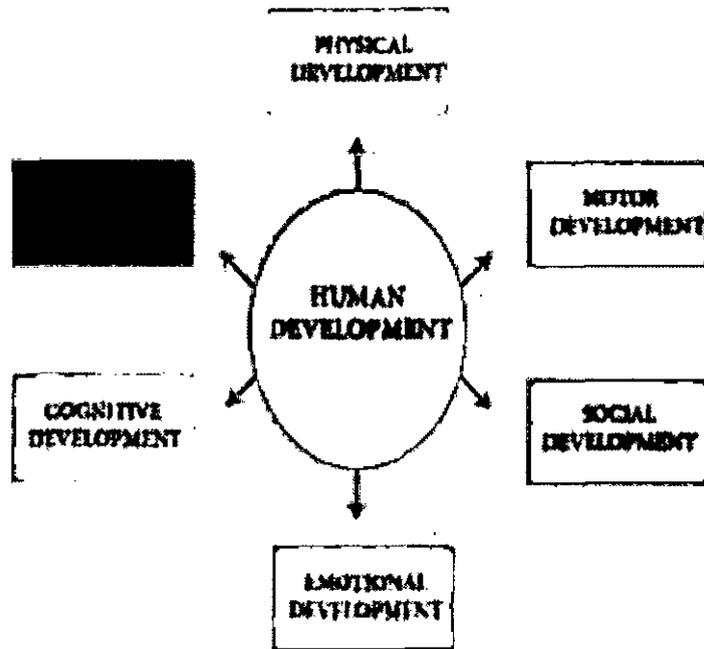
Infancy is very critical and shortest of all developmental periods. Infancy is the second most rapid period of development and growth. Infancy begins with birth and ends when the infant in approximately two weeks old. This period is divided into two periods namely



- i. Period of the Parturate – from birth to fifteen to thirty minutes after birth. The infant continues to be a parasite until the umbilical cord has been cut and tied.



- ii. Period of the Neonate – from cutting and tying of the umbilical cord to approximately the end of the second week of postnatal life. During this period, the infant must make adjustments to the new environment.



▲ Fig. 1 Domains of development in the human life cycle

a. Physical Development

Infants differ greatly in appearance and physiological functions at birth and in their early adjustments after birth.

Body Length and Weight

At birth, the average infant weighs 3 to 3.5 kg and measures 50 cm (20 inches) in length. Weight in relation to height is less at birth. The muscles of the new-born are soft, small and uncontrolled.

Physical Proportions

Babies have a large head and prominent forehead; chubby cheeks and the chin is much too small. The nose is small and flat. The neck is short and almost invisible.

The shoulders are narrow, while the abdomen is large and bulging. Hands and feet are miniature. With the birth cry, the lungs are inflated and respiration begins. Neonatal heart beat is more rapid. Elimination of waste products begins in a few hours after birth. The relative proportion is shown in figure 2.

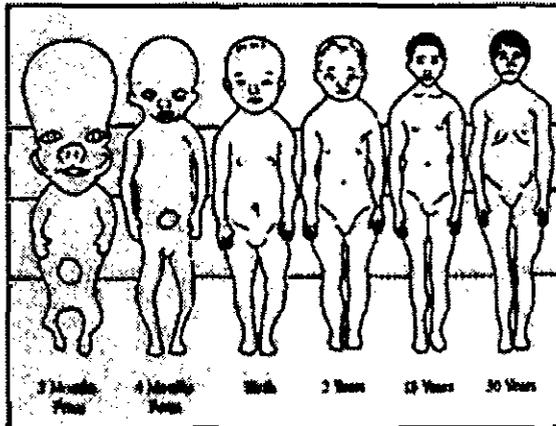
b. Motor Activities

The first activities of human infant are random, imperfect and uncoordinated. The most common of these include visual fixation of light, spontaneous eye movement, sucking, swallowing, lifting the head, hand movements, leg and foot movements and body jerks.

c. Sensory Abilities of the infant

i. Sight

At birth, the retina has not reached its full development. There is no coordination between both eyes. At about thirty hours, the papillary reflexes are well established. They can detect movement as early as two or three days after birth. At seventh or ninth day of life, they respond to different colours.



▲ Fig. 2 Relative Proportions

ii. Hearing

At birth, hearing is lowest because the middle ear has amniotic fluid.

iii. Taste

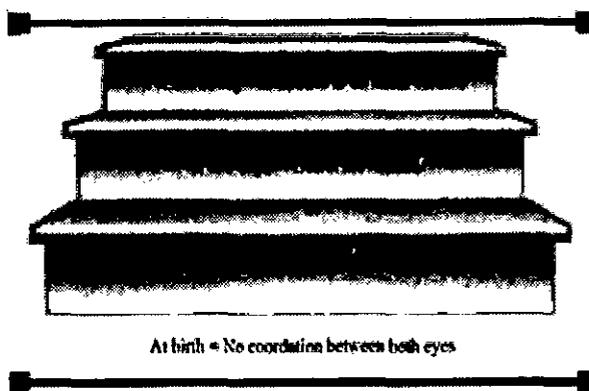
During the first week of life infants react differently to different tastes.

iv. Smell

Infants are able to sense the odours that adults can sense.

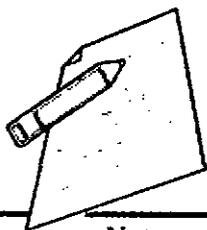
v. Skin Sensitivities

The skin sensations of touch, pressure, temperature and pain are present at birth.



▲ Fig. 3 Sensory abilities of infants





Notes

d. Adjustments during Infancy

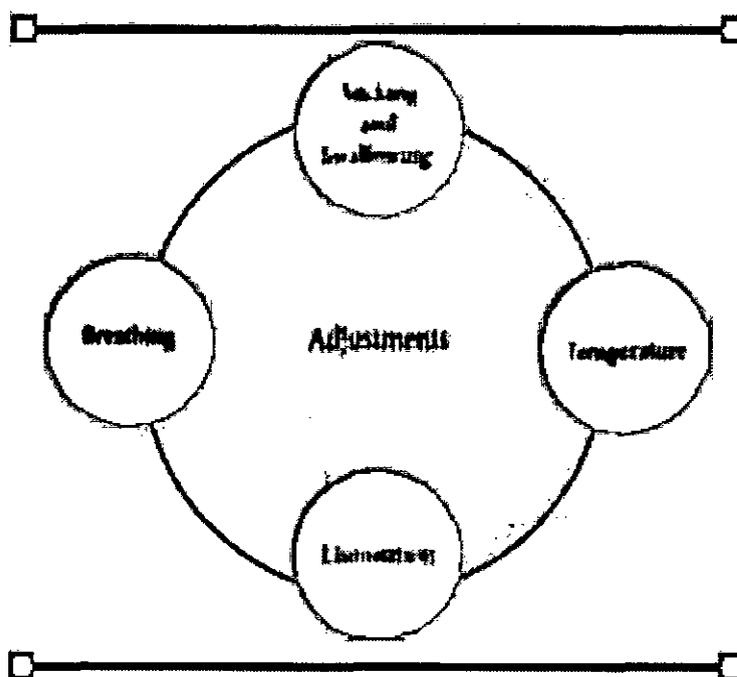
Every new born infant's adjustment to postnatal life is difficult at first. They must make 4 major adjustments before they can resume their developmental progress.

i. Breathing

During prenatal stage, the foetus is supplied oxygen through the umbilical cord. When the umbilical cord is cut after birth the infants must begin to breathe on their own. The infants take their first breath immediately after birth as they cry since their lungs are filled with oxygen.

ii. Temperature Changes

Before birth, the infants are in temperature of 98o-100oF in the uterine sac, while temperature in the hospital or home may vary from 60 to 70°F.



▲ Fig. 4 Adjustments during infancy

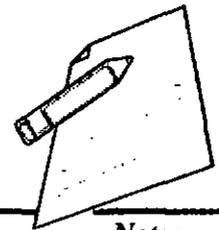
New-borns are usually kept warm by providing suitable warm clothing, warm bedroom or placed next to the mother's warm body.

iii. Sucking and Swallowing

Infant must now get nourishment by sucking and swallowing, instead of receiving it through the umbilical cord. These reflexes are perfectly developed at birth and are increased along with development.

iv. Elimination

The infant's organs of elimination begin to work soon after birth. Formerly, waste products were eliminated through the umbilical cord. After birth, defecation occurs at an average of 4 to 7 times and urination at an average of 18 times.



Notes

d. Emotional Development of Infancy

At birth, the emotions consist of only pleasure and pain. Pleasantness is expressed by relaxing of body and is elicited through patting, rocking, warmth and sucking. Unpleasantness is expressed by tensing of the body, kicking, wriggling and crying.

e. Cognitive Development

New-borns interact with their environment entirely through reflexive behaviours. They follow their instincts and involuntary reactions to get what they need: food, air, and attention. Babies begin to grow and learn about their environment through their senses.

Table 11 Stages in the human development

	Prenatal period	Conception to birth
	Infancy	Birth to the end of the second week
	Babyhood	End of the second week to end of the second year
	Early childhood	Two to six years
	Late childhood	Six to twelve years
	Adolescence	Twelve to Eighteen years
	Early adulthood	Eighteen to forty years



Notes

Table 1 (continued)



Middle age

Forty to sixty years



Old age

After sixty years

Babyhood

Babyhood continues from infancy to the second year. It is the true foundation age with rapid growth and development.

a. Physical Development during Babyhood

Height

During babyhood, changes in the over-all size of the child's body are more rapid than any other time after birth. The baby measures between 23 and 24 inches at four months, by the end of one year the baby measures between 28 and 30 inches and between 32 and 34 inches at two years.

Weight

During the first year, weight changes are more than height changes. At four months the babies' weight will double their birth weight and triple it at 1 year. At one year, babies weigh, on the average, three times as much as they did at birth, or approximately 10 kilograms. Increase in weight during babyhood comes mainly from an increase in fat tissue.

Physical Proportions

Growth of the head slows down in babyhood while the trunk and limb growth increases. Thus, the baby gradually becomes less top-heavy and appears more slender and less chubby by the end of babyhood.

Bones

The fusion of bones increases during babyhood. Calcification begins in the early part of the first year but is not completed until puberty. The soft spot on the skull (fontanelle) will be closed by the end of two years.

Muscles and Fat

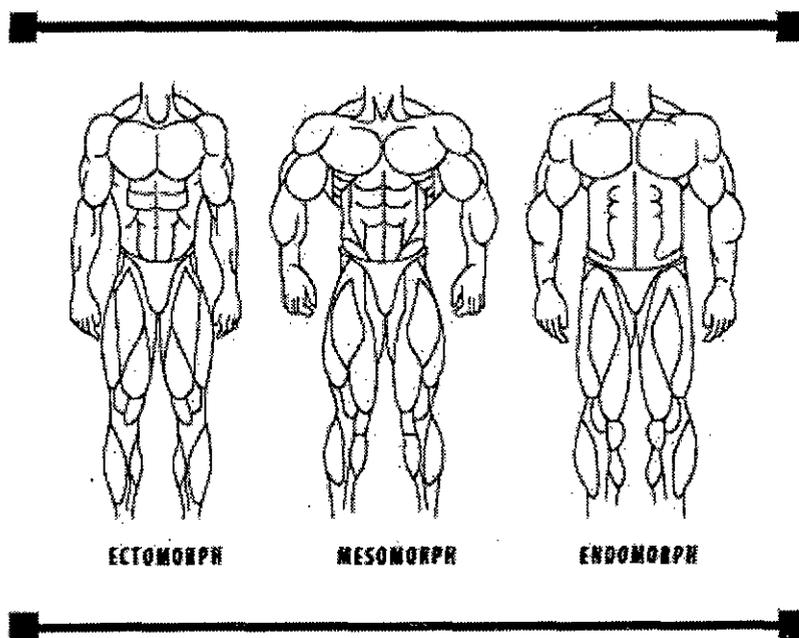
Muscle fibres are present at birth but in very under developed forms. They grow slowly during babyhood and are weak. The fat tissue develops rapidly during babyhood due partly to the high fat content of milk.

Body Builds

Babies begin to form characteristic body builds from during their second year of life. The three most common forms of body build are ectomorphic, which tends to be long and slender, endomorphic, which tends to be round and fat, and mesomorphic which tends to be heavy, hard and rectangular.

Teeth

By the end of one year the baby has four to six temporary teeth and sixteen by the age of two. The teeth present in the front will emerge first and the molars which are situated at the back appears last.



▲ Fig. 5 Types of Body build

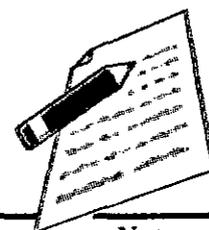
Nervous System

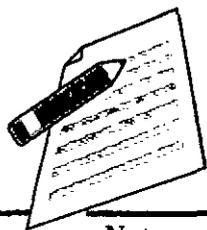
The brain weight is one-eighth of the baby's total weight at birth. During the first 2 years, brain weight is gained and this leads to the baby's top-heavy appearance. The cerebellum and the cerebrum triple its weight in one year. Immature cells, present at birth, continue to develop after birth but relatively few new cells are formed.

By three months, the eye muscles are well developed and babies can see things clearly. They can also see colours. Hearing develops rapidly during this stage. Smell and taste are improved during babyhood. Babies are highly responsive to all skin stimuli because all sense organs relating to touch, pressure, pain, and temperature are present in well-developed forms.

b. Motor Skills Development during Babyhood.

After the fast growth spurt in infancy, the growth rate of the baby is slow. Motor development means the ability to control movement of several parts of the body through coordinated movement of muscles and limb. The sequences of postural control and locomotion among babies as reported by Schiamberg are as follows





Notes

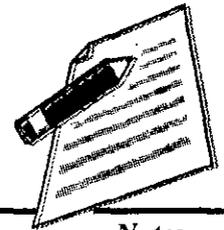
Table 2 Postural Control and Locomotion during Babyhood

Age	Development
1 st month	Holds chin up
2 nd month	Holds chest up Rolls from side to back
3 rd month	Reaches and misses object
4 th month	Sits with support.
5 th month	Sits on lap and Grasp objects
6 th month	Sits on high chair and grasp dangling object
7 th month	Sits alone and starts to crawl
8 th month	Stands with help
9 th month	Stands holding furniture
10 th month	Creep
11 th month	walking with support
12 th month	Pulls to stand by using furni- ture
13 th month	Climb stairs
14 th month	Stands alone
15 th month	Walk alone

In this sequence of development, it can note that the development proceeds from head to foot as shown in figure 6

c. Social Development

The baby begins to communicate with others by gestures and also develops close relation with care givers like mother and father. At about five weeks of age, the baby smiles in response to



Notes

patting. By the second month it recognizes his/her mother and by the third month the baby will turn its head in response to human voice. Once the babies get attached to their mother, they show fear on separation.

d. Emotional Development

Until use of language begins, it is emotions that make adults know the needs of baby. As age increases, emotions become less diffused and more specific and differentiated in relation to cause, and they can be aroused by a wide variety of stimuli. It is shown in figure 7

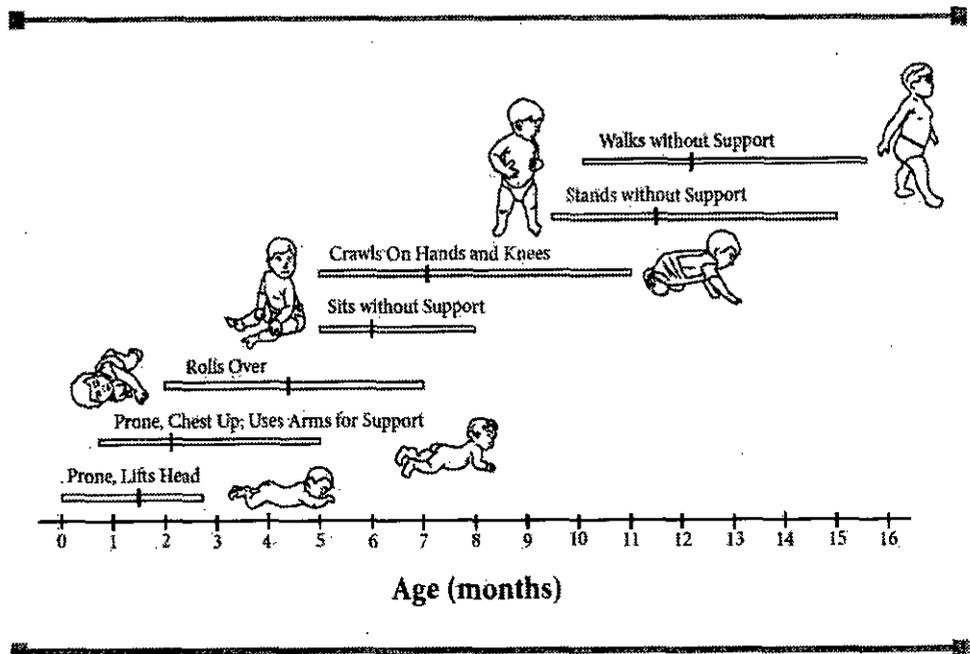
e. Cognitive Development

According to Piaget’s theory babyhood is the “sensory motor” stage. Babies understand the permanence of objects and people. They visually follow the displacement of objects and begin to use instruments and tools. They also understand discipline and what behaviour is appropriate and in appropriate. They also understand the concepts of words like “please” and “thank you”.

f. Language Development

Language development is an important means of becoming independent for the baby. It gives him a new power to communicate their feeling to others.

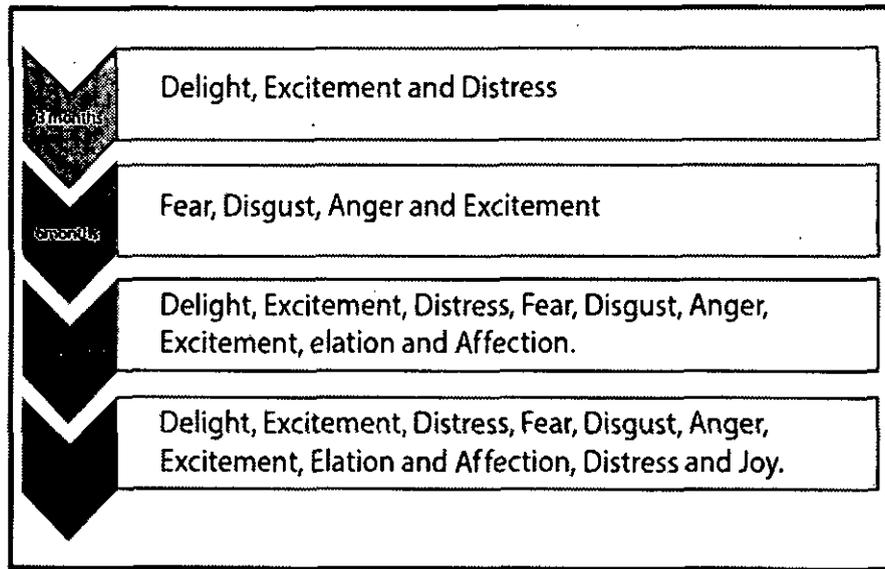
- Before the baby speaks words, they show the ability to produce vowel and consonants sounds.
- By the third month the baby coos and babbles before he/she speaks words. These two along with gestures are known as pre -speech forms.
- By six months he/she produces most of the vowels and few consonants sounds.



▲ Fig. 6 Postural control and locomotion development



Notes



▲ Fig. 7 Emotional development in babyhood

Cooing– quick burst of squealing noise.

Babbling– production of inarticulate meaningless speech sounds which are sequences of vowels and consonants such as da-da-da.

g. Physiological Function

Babyhood is the time when the fundamental physiological patterns of eating, sleeping and elimination should be established, even though the habit formation may not be completed when babyhood ends.

Childhood

Childhood begins at the conclusion of babyhood and extends to the time when the child becomes sexually mature at thirteen years for girls and fourteen for boys. Childhood period is now divided into – early and late childhood.

Early Childhood

Pattern of Development in Early Childhood

Growth during early childhood proceeds at a slow rate when compared with the rapid rate of growth in babyhood.

a. Physical Development in Early Childhood

i. Height

The average annual increase in height is 2.5 inches. By the age of six, the average child measures 46.6 inches (118.36 centimetres).



ii. Body weight

The average annual increase in weight is around 1.6-2.3 kilograms. At age six, children should weigh approximately 7 times as much as they did at birth. An average girl weighs 25-30 kilograms and boy weighs 30-32 kilograms.

iii. Body proportions

Body proportions change markedly and the baby look disappears. Facial features look small but chin becomes more pronounced and neck elongates. The stockiness of the trunk is decreased and the abdomen appears flat. Chest and shoulder become broader and flatter. Muscle begins to form and growth of the head slows down. Arms and legs lengthen and hands and feet grow bigger.

iv. Body build

Children have an endomorphic or mesomorphic or ectomorphic type of body build based on their gene make up, diet and physical activities.

v. Bones

Bone development consist of growth in bone size, change in the number of bones and composition. The bones calcify at different rates in different parts of the body. Bones become harder and stronger, giving the child a firmer shape and protecting internal organs.

vi. Teeth

At the beginning of early childhood, the baby has all of their milk teeth. In the last year of early childhood, the baby loses its milk teeth which are replaced by permanent teeth. The permanent teeth to appear first are the front central incisors. When early childhood ends the child has one or two permanent teeth in front and some gaps where permanent teeth will eventually erupt.

vii. Nervous and Muscular system

The growth of the nervous system is very rapid during babyhood and slows down at 3-4 years. Development of immature to mature cells occurs at this stage. These changes are coordinated by the maturing brain and the nervous system promotes the development of a wide range of motor skills. The brain is about 75 percent-age of its adult weight at five years and is 90 percentage of adult weight at eight years.

viii. Sensory Organs

The growth of the eyeball is not complete until puberty so young children tend to be far sighted. Vision and focusing ability improve consider-ably as children grow through these years. The need for corrective lenses becomes more noticeable in early childhood.

b. Motor Development

During the first four or five years, the child gains control over gross and fine movement. Table 3 summarizes the development of motor skill.

*Notes*

Artistic expression seems to peak by the end of the early childhood period. During these years, children begin to paint and hold the brush with thumb and fingers. They give names to their drawings and begin to represent things.

c. Social development

This age is characterized by the widely expanding world and awareness of people and things.

They learn how to make social contact and get along with people outside the family, especially with peer group (children of their own age). Play is an important part of social development. By the age of 3-4 years, they learn to adapt and cooperate in group play activities. This increases his/her social contact which increases the chances for social behaviour of others.

i. Social Behaviours

Imitation-Children imitate the attitudes and behaviour of a person whom they especially admire and want to be like.

Handedness

Early childhood may be regarded as a critical period in the establishment of handedness. During this period, children shift from the use of one hand to the other and are asked to concentrate on learning skills with one dominant hand and other as the auxiliary or helping hand. For example, in case of colouring, the dominant hand is used for colouring and the auxiliary to hold the paper.

Rivalry-Children feel an urge to out-do others at home and outside.

Co-operation-Children at the end of the third year learn to socialize and co-operate with their peer group. Their inclination to play with other children increases.

Sympathy-Play contacts develop sympathetic attitudes in children. This helps in understanding feelings and emotions of others.

Sharing-Sharing and caring will win social approval. Children learn this while playing with friends.

ii. Unsocial Behaviours

Negativism-The habit of contradicting elders starts between 3 and 4 years and then it declines.

Aggressiveness-The physically aggressive behaviour that begins by the age of 2, normally declines by the age of 4 giving way to verbal attacks like name calling or blaming others.

Bossiness-Children become more authoritative at the age of 3.

Destruction-The children display their temper by destroying anything within their reach.

d. Emotional Development

The emotional expressions of children differ from those of adults. Emotions can be broadly classified as positive emotions (integrative) and negative emotions (disintegrative). Such emotions are joy, affection, curiosity and sympathy. Negative emotions on the other hand give an unpleasant feeling and disliked by others. The examples of such negative emotions are anger, fear, jealousy, envy, grief and anxiety.



Notes

e. Cognitive Development

The mental development that occurs in early childhood is exciting and dynamic as children explore their environment, develop ideas, learn solutions to problems, participate in imaginary play, and gain a unique understanding of the world and how it operates. Children make judgments based on a limited understanding of operations and rules and with minimal cues and information. Young children may have trouble telling the difference between what is real and what is fantasy. With increased ability to ask questions in words, they understand people, objects and situation rapidly. After this, the child obeys commands but does not understand why things are right or wrong.

f. Language Development

Early childhood is known as “the chatter box age” because children are able to speak with ease. They may use gestures but mainly as supplements to speech. During early childhood, there is a strong motivation to learn to speak. At approximately 2 years of age, their ability to use language suddenly increases rapidly. The formation of sentences follows a fairly definite and predictable pattern in early childhood. Two- to three-year-old children usually use short sentences of three or four words. Many of the sentences are incomplete.

Behavioural problems in children

Young children often demonstrate behaviours which are inappropriate. For example, a child may be in a habit of hitting everybody else, breaking things, abusing/telling lies, etc. These are behaviours which not only harm children physically but also make them unpopular with other children. Causes: There can be many reasons why children develop these behaviours. Some are listed here:

When children live in an environment which forbids any self-expression, they pick up behaviours which are unacceptable.

When parents and teachers expect too much from children and they are not able to keep up to expectations, they show unacceptable behaviour.

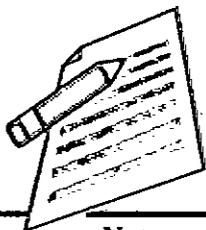
Often children learn that unacceptable behaviours are tools to get what they want. For example, the child learns that when he hits his younger siblings’ parents attend to him or when he cries and rolls on the floor, he gets the toy he wants.

When family environment is disturbed, children start showing unacceptable behaviour, e.g., when parents quarrel with each other, they hit each other or when their mothers and grandmothers do not get along with each other.

When there is a crisis in the child’s life. Children show unacceptable behaviours on birth of another sibling, the death of a beloved member of the family.

Children may also develop unacceptable behaviours because physically they are not able to cope up. This happens when they have had a long illness or when they fall sick too frequently. The caregivers at the play centre have to be alert and understanding.

whenever there is a child who shows unacceptable behaviour they must act immediately. Since, very often the cause of the behaviour originates from home they must ask for cooperation of the parents, understand the problem and develop a strategy which helps to cure the problem. Punishing and scolding or ridiculing will not help.



Notes

SUMMARY

Growth is defined as physical changes in body size, structure, bodily dimensions and increase in magnitude, muscular strength and organs. Development is a progressive series of changes in an orderly, coherent pattern whereby an individual adapts to their environment. Development includes physical characteristics (height, weight), intellectual functions (creativity, performance of intelligence) and social characteristics (independence, aggressiveness). Young children often demonstrate behaviours which are inappropriate. For example, a child may be in a habit of hitting everybody else, breaking things, abusing/telling lies, etc. These are behaviours which not only harm children physically but also make them unpopular with other children. Causes: There can be many reasons why children develop these behaviours. Some are listed here: When children live in an environment which forbids any self-expression, they pick up behaviours which are unacceptable. When parents and teachers expect too much from children and they are not able to keep up to expectations, they show unacceptable behaviour.

EXERCISE

Multiple Choice Questions

1. Choose the correct answer. Justify your answer.

Children develop unacceptable behaviours if the environment is

- | | |
|-------------------------|-----------------------|
| (a) forbidding | (b) free |
| (c) forbidding and free | (d) none of the above |
2. A child sucks her thumb because she is:
- | | |
|------------|--------------------------|
| (a) bored | (b) insecure |
| (c) scared | (d) asking for attention |
3. A child wets the bed because she is :
- | | |
|------------|--------------------------|
| (a) bored | (b) insecure |
| (c) sacred | (d) asking for attention |
4. A child tells lies because she is :
- | | |
|-------------|--------------------------|
| (a) bored | (b) insecure |
| (c) jealous | (d) asking for attention |

Answers: - 1) a) - a child living in an environment which forbids any self-expression develops unacceptable behaviour

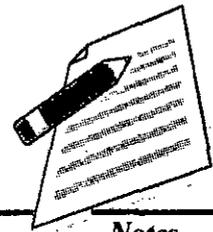
2) a) - a child who is bored will often suck thumb.

3) b) c) a child who is insecure and scared may wet the bed

4) d) a child asking for attention may still lie.

Activity 1

Observe your friends and write down their physical activities. Observe differences among them.



Activity 2

Collect photos/ Pictures of each stage of the life span and paste them on a chart. Ob-serve and record pattern of development.

Review Questions

1. List milestones of motor development.
2. Describe the cognitive characteristics of a 4-year-old child.
3. Why are some people left-handed? What happens if they are forced to become right-handed?
4. What points should be considered while selecting clothes for children?
5. Give the latest immunization schedule for children.
6. Define behaviour problems. Give the causes and methods to control any five of them.



Notes

17 GROWTH AND DEVELOPMENT (6-11 YEARS)

Growth and Development (6-11 years): Characteristics of physical, motor, socio emotional, cognitive and language development.

- Understand the concept of development.
- Understand the development during late childhood.
- Understand the language development.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of development so that the characteristics of late childhood development can be learned.

Growth and Development (6-11) yrs.

Late Childhood

Late childhood extends from the age of six years to the time the individual becomes sexually mature. This period is marked by conditions that profoundly affect a child's personal and social adjustment. The child enters school and experiences a major change in the life pattern.

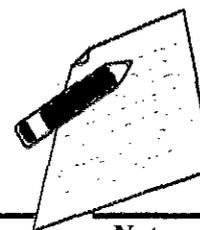
1. Physical Development

Late childhood is a period of slow and uniform growth until the changes of puberty begins. **Height and Weight**-The child's height and weight approximately reaches 2/3rd of adult height. Both boys and girls can be expected to grow about two to three inches each year. The average height for boys is slightly greater than that of girls throughout this period. However, a girl's average height between ten and twelve years exceeds that of boys. At the onset of puberty, an average 11 years old girl has a height of 58 inches while an average boy of the same age has little lesser than that.

By 6 years of age, most children are about seven times their birth weight. Weight increase is at the rate of 1.3 to 2.3 kg. The average 11-year-old girl weighs 40.1 kg and an average boy of the same age weighs 38.7 kg.

Body proportions-Body shapes of individuals are characterized by a greater proportion of body fat to muscle among females, while the opposite is true for males. Facial disproportions disappear as the mouth and jaw become larger, the forehead broadens and becomes slimmer, the neck becomes longer, the chest broadens, the abdomen flattens, the arms and legs lengthen and hands and feet grow larger but at a slow rate.

Muscle development-The increasing level and desire for physical activity in middle childhood reflects the increasing size and strength of a child's muscle. Gain in weight is due to increase



in size of skeletal, muscular systems and some organs. Muscle mass and strength gradually increases as “baby fat” decrease in middle and late childhood. Throughout the middle years muscle growth tends to be extremely rapid, and they are firmly attached to the bones. Eye-hand coordination also improves and by twelve years of age, most children have highly coordinated muscles.

Bone development-As the child approaches sexual maturity, the rate of bone development will quicken in response to stimulation due to sex hormones that are produced in large quantities. The length and width of the bones increase. In late childhood, bones are hardened and reach a final mature shape.

Development of Teeth-The primary teeth that erupted during infancy and early childhood are lost from the age of six up to thirteen years. All milk teeth are replaced with primary teeth. Girls are found to have permanent teeth earlier than boys.

Brain Development-About 90% of adult brain size is achieved by age six. During late childhood, brain development includes the organization of brain functioning and myelination. Functions of the right and left hemisphere become well established during this age group.

2. Motor development during late childhood

Children are eager to participate in activities that require large muscle movements. They spend more time in free, unstructured activities, rough games and vigorous play such as wrestling, kicking and chasing. By 6 years, most children can skip rope and begin to ride a bicycle and by 7 years most begin to perfect the movement necessary for catching, throwing, swimming and hitting ball. They develop flexibility in different parts like wrists and legs.

3. Social development

A number of changes in social development occur in the late childhood years. Besides the parents and the family members, the peer group comes to take an important place in the child's life.

Creation of childhood gangs-Upon beginning schooling, children enter the “gang age” when social consciousness develops rapidly. It is characterized by interest in peer activities and an increasingly strong desire to be an accepted member of a gang.

Over sensitiveness-A common out-growth of susceptibility to social approval and disapproval is over sensitiveness. The tendency to be easily hurt by peers or siblings or parents and to interpret what others say and do as hostile, is a measure of the children's desire for social acceptance.

Responsibility-Children who learn to assume responsibility at home not only make better adjustment with their peer group but also are likely to be selected for leadership roles.

4. Emotional development in late childhood

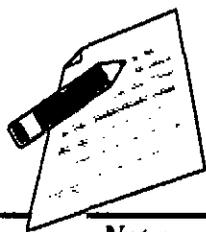
Temper Tantrum

Tantrum or temper tantrum is an emotional outburst of children. It is typically characterized by crying and screaming.

Anger

Anger is expressed when needs are not fulfilled. It is expressed through screaming, withdrawal, destructive and disrespectful behaviour.

Fear



Fear is still found in late childhood. A large proportion of the fears shown in childhood persist into the adulthood.

Anxiety

Children's anxiety increases somewhat with maturity. This anxiety makes children bored, restless and disturbed and they cannot concentrate. They feel insecure and show their anxiety by nervous mannerism and speech problems.

5. Cognitive Development

As a child develops there are considerable changes in his mental abilities which include imagination, memory, creativity, questioning and perception. They can also develop a plan to meet desired goal. They have a better understanding of spatial concepts of causality of categorization of inductive reasoning. Children begin to read and write and start gaining skills in reading and writing.

6. Language Development

Linguistic skills are improved or acquired by an individual with the help of parents and from the world outside the family such as television, radio, books and peers.

Children in the first grade, on average know about 20,000 to 24,000 words. By the sixth grade they will know about 50,000 words. Not only do older children learn new words, they also tend to learn new meanings for old words. The length of sentences increases from 6 years. The characteristic chatterbox stage of early childhood is replaced by more controlled and selective speech.

SUMMARY

Late childhood extends from the age of six years to the time the individual becomes sexually mature. This period is marked by conditions that profoundly affect a child's personal and social adjustment. The child enters school and experiences a major change in the life pattern. Late childhood is a period of slow and uniform growth until the changes of puberty begins. The child's height and weight approximately reach 2/3rd of adult height. Both boys and girls can be expected to grow about two to three inches each year. The average height for boys is slightly greater than that of girls throughout this period. However, a girl's average height between ten and twelve years exceeds that of boys. At the onset of puberty, an average 11 years old girl has a height of 58 inches while an average boy of the same age has little lesser than that. Children in the first grade, on average know about 20,000 to 24,000 words. By the sixth grade they will know about 50,000 words. Not only do older children learn new words, they also tend to learn new meanings for old words. The length of sentences increases from 6 years. The characteristic chatterbox stage of early childhood is replaced by more controlled and selective speech.

EXERCISE

Review Questions

1. List milestones of motor development.
2. Describe the cognitive characteristics of a 6-year-old child.

3. Describe the social characteristics of a 6-year-old child.
4. Describe the physical characteristics of a 6-year-old child

Case study

Harish has difficulty to do homework, cannot do quiet tasks or activities. He dashes around, touching or playing with anything and everything in sight and is very impatient. He also blurts out inappropriate comments, shows his emotions without restraint, and acts without regard for consequences.

From above case study what are your inferences about his condition? What is the specific name given to this condition?

Answer: Harish is hyper active and his condition is called as "Attention Deficit Hyperactivity Disorder".





Notes

18 ADOLESCENCE

Adolescence: Definition and physical development, sexual maturation and sex education, Characteristics of physical, motor, socio emotional, cognitive and language development, problems faced by adolescents.

- Understand the concept of adolescence.
- Understand the development during adolescence.
- Understand the language development.
- Understand the concept of sex education.
- Discuss the concept of sexual maturation.
- Discuss the problems faced by adolescent.

Objective of the chapter:

The basic objective of this chapter is to through some light on the initial concepts of adolescence development so that the characteristics of adolescent development can be learned.

Adolescence - Growth and Development Definition

Adolescence is derived from the Latin word "adolescere" meaning to grow into maturing. The World Health Organisation defines adolescence as any person between the age of 10 and 19. It is between child-hood and adulthood and is closely related to the teen age years.

ADOLESCENTS: Persons between 10 and 19 years of age



Stages of adolescence in boys and girls

Adolescence may be divided into three stages namely pre adolescence, early adolescence and late adolescence.

Table 4 Stages in Adolescence

Stages in adolescence	Girls (years)	Boys (years)
Pre-adolescence	10-12	11-13
Early adolescence	12-16	13-17
Late adolescence	16-21	17-21

The period of adolescence is extremely important in one's life because at this stage, one moves from childhood to the onset of maturity. In every period of development from birth onwards a person may face many challenges due to the changes that occur during that period. Each phase in life has distinct characteristics.

Characteristics of the Adolescent Period

(i) Transitional period

Adolescence is a period of transition. During this phase the individual's status is vague and there is a confusion about the roles they are expected to play as they are neither children nor adults.

(ii) Period of change

The stage of adolescence is characterized by changes in physical, cognitive, social and emotional areas of their lives. This sets them apart and uniquely distinguishes them from other stages

(a) Physical changes

During adolescence, primary sex characteristics (the reproductive organs) develop and mature and secondary sex characteristics appear.

Primary Sex characteristics-In males, the testes grow rapidly during the first year or two of puberty. After that, the penis starts to grow in length and the seminal ducts and the prostate gland enlarge. The female uterus, fallopian tube and vagina grow rapidly through puberty. The ovaries produce ova and secrete the hormones needed for pregnancy, menstruation and the development of secondary sex characteristics.



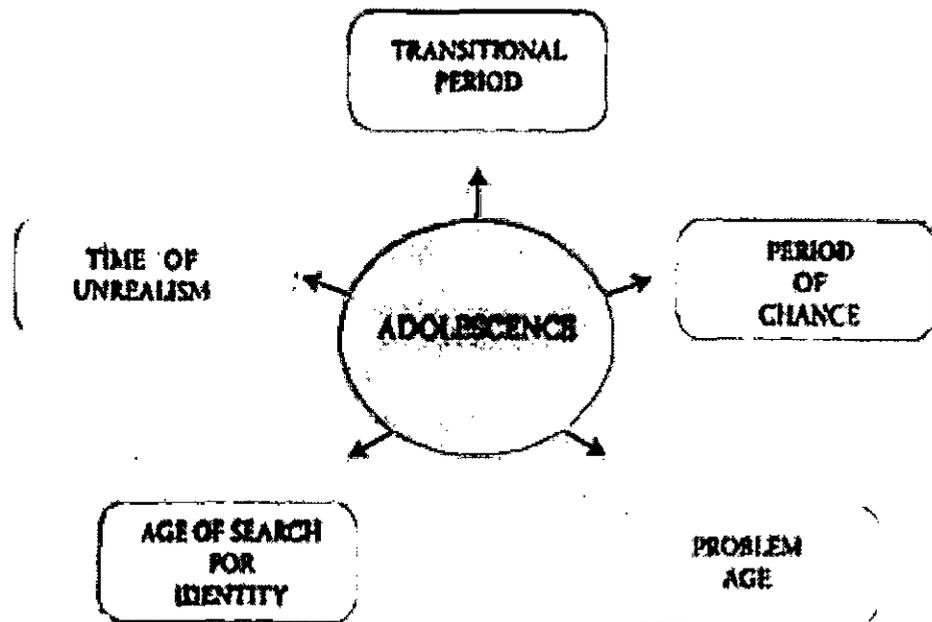


Table 5 Secondary sex characteristics in adolescent boys and girls

Secondary sex characteristics	
Girls	Boys
Breasts develop	Pubic hair appear
Pubic hair appear	Axillary hair appear
Axillary hair appear	Facial hair and body hair appear
Increased width and depth of pelvis	Voice change

Source: Lefton, 1985

The secondary sex characteristics are those which are not directly tied to reproduction yet distinguish the male from the female species. The secondary sex characteristics between boys and girls are given in the table above:



▲ Fig. 8 Characteristics of the adolescent period



Notes

(b) Cognitive changes in adolescents

In this stage, adolescents develop the ability to process information, improve in areas of decision making, memory, critical thinking and self-regulatory learning. This is known as the 'Formal Operation Stage of Development'

(c) Social Changes and Development During Adolescence

Friendship during adolescence is based on similarities and interests. The common social groups in adolescence is as follows:

Chums- close friends – They are inseparable companions as confidants **Cliques** – They are made up of groups of close friends

Crowds – they are made up of cliques and close friends

Organised groups – These groups are planned by organized sectors like schools, churches or community centres

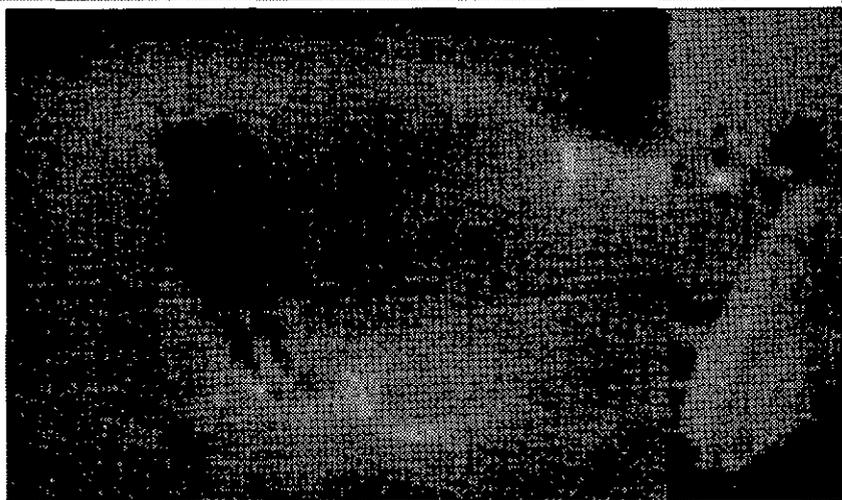
Gangs- They are a group of boys and/or girls who are poorly adjusted to society. Significant changes in the area of social development occur in the period of adolescence with regard to their peers and relationship with adults.

Relationship with peers- Adolescents are very much influenced by their peer group. Their behaviour and attitude are affected by peers.

Relationship with adults- Adolescents develop values different from the ones held by adults because the influence of peer group is more than that of adults. Hence the adolescent is torn between his loyalty to his parents and peers. Their values often clash with those of adults and many rebel against parental authority.

(d) Emotional changes

Adolescence is said to be a period of heightened emotionality. Heightened emotionality is a state of more than normal emotional experience. This period is often known as the "period of storm and stress". The word storm and stress suggest anger and turmoil.





Notes

Causes for Heightened Emotionality

The major causes for heightened emotionality are as follows:

- **Psychological problems due to physical changes**—Sudden spurt in height, appearance of secondary sex characteristics, voice change, appearance of pimples and acne, on the face. etc. cause much embarrassment to them and they become worried about their physical appearances.
- **Social expectations**-Adolescents are treated neither as a child nor as an adult. The constant pressure to live up to social expectations causes a generalized state of anxiety in them.
- **Unrealistic aspirations**-Adolescent aspirations are sometimes unrealistic. When they are not able to attain them, they feel inferior and frustrated.
- **Urge for sex**-Reproductive hormones are active and so there is the presence of sex urge. This may lead to anxiety.
- **Identity crises**-The adolescent is expected to form a realistic self-concept. They have to try out different roles and develop a holistic idea of their future role. Until they find their role they are often confused and anxious
- **Unfavourable family relationships**-Conflicts often occur between adults and adolescents due to the generation gap between them.

(iii) Adolescence is a problem age

Adolescence is known as a problem age because they are faced with many challenges that arise due to the anatomical, psychological changes. This is further enhanced by peer pressure and conflicts with parents and elders. Most of these problems are aggravated due to misleading and misguiding parents, teachers and friends, ignorance of elders, being half informed or ill-informed about the realities in life and wrong messages and concepts depicted through the media

(iv) Adolescence is period when there is search for identity

Adolescence is the period of transition between childhood and adulthood. It is a stressful and confusing period because at times they are expected by the society to think and behave in mature manner. At the same time, they are often reprimanded for the same and are demanded to be meek and submissive as they are under the control of parents, elders and teachers. The conflicts that arise due to this, cause a lot of stress among adolescents as they are confused whether they should be like children or behave as adults.

(v) Adolescence is a time of unrealism

Many adolescents have unrealistic goals and aspirations. They live in an imaginary world. These unrealistic thinking pattern may often lead to anxiety and depression especially when they are not able to fulfil their goals. For this purpose, it is important for parents, teachers and elders to guide adolescents into identifying their strengths, weakness, opportunities and challenges and help them set realistic goals based on available resources.

Problems faced by Adolescents

1. Physical Problems

- Physical changes happen due to change in the teenager's hormone levels.
- Development of full breasts in girls can be awkward in the beginning. Girls may start to feel conscious about their figure.



Notes

- Change of voice and appearance of facial hair in boys is perhaps the most prominent change that takes place during adolescence.
- Acne is one of the major problems.
- Muscle gain sometimes leads to excessive body weight in teens.
- The growth of pubic hair in girls and boys.
- Body odour becomes evident.
- Girls start their periods.

2. Emotional changes and problems

- Hormones affect your teenager not only physically but also emotionally.
- Adolescence is the age between adulthood and childhood. Teenagers are often confused about their role and are torn between their responsibilities as growing adults and their desires as children.
- They tend to feel overly emotional (blame it on the hormones). Just about anything and everything can make them happy, excited, mad or angry.
- Adolescent girls are vulnerable to crying.
- Mood swings are common among teenage boys and girls.
- Bodily changes result in self-consciousness.
- Children who hit puberty early may even feel weird.
- Feelings of inferiority or superiority may arise at this time.
- Adolescence is the age when sexual feelings arise in youngsters. Feelings and thoughts about sex can trigger a sense of guilt.

3. Behavioural Problems

- Overwhelming emotions can lead to impulsive behaviour, which can be harmful to your child as well as others. Mostly, it is just teen behaviour that will last as long as their adolescence.
- Adolescence is the time when children develop and exercise their independence. This can give rise to questioning the parents' rules (seen as argumentative) and standing up for what they believe is right (seen as stubbornness).
- Significant developmental change in the brain makes teens moody, tired and difficult to deal with.
- The raging hormones in teenage boys can even push them to get into physical confrontations. They would also want to listen to loud music.
- As a part of their new-found independence, adolescents may also want to try new things and take risks, resulting in careless behaviour.
- Sometimes, peer pressure and the need to 'fit in' can make them behave in a certain way or develop certain habits that are hard to break.
- Your teen's dressing, hairstyle, and sense of fashion also change, mostly to something that you may not approve of.
- The most troubling behaviour is perhaps your teen hanging out with problem children and adapting to a dangerous lifestyle.
- Lying is one of the common teen behavioural issues. Teens may lie to avoid confrontation with parents or out of fear.

*Notes*

4. Substance Use and Abuse

- Teenagers are vulnerable and can be easily swayed to the wrong side. Substance abuse is one of the biggest problems that parents of adolescents around the world have to deal with.
- Peer pressure is one of the significant factors that drive adolescents to take up smoking and drinking or to do drugs.
- The tendency to take risk encourages most teens to try smoking or drinking even before they are of legal age.
- What may start as a 'thrill', can become a habit if it remains unchecked.
- If there is somebody who smokes or drinks at home, they can become your teen's role models.
- Poor self-esteem and the need to be 'cool' can push adolescents to smoke or drink.
- Easy access to substances like cigarettes, alcohol, drugs, and anabolic steroids may increase the temptation to try illicit substances.

5. Educational challenges

- High school is not all about fashion, friends, and parties. Children also have a lot of educational activities on their plate.
- Pressure to perform academically and obtain college admission can be stressful and make your teenager moody.
- Juggling school work, extra-curricular activities (must for college admissions) and chores at home can be tiring.
- Distractions at school can result in poor academic performance, which will add to the pressure.

6. Health problems

- Adolescents are vulnerable emotionally and physically. Without proper nutrition and healthcare, they are susceptible to illnesses. According to a 2015 WHO report, 1.3 million adolescents died in 2015, a majority of them had preventable diseases.
- Teenagers have a hectic schedule as they hop from one activity to another with little time to eat or rest properly. Unhealthy eating habits prevent them from getting the nutrition they need.
- Consciousness about their body can lead to eating disorders, especially in girls. Adolescent girls who worry about their weight and appearance can develop disorders like anorexia or bulimia.
- Stress can also lead to loss of appetite and sleeplessness in young children.
- Unhealthy eating habits and a less active lifestyle could also lead to obesity— this is often the case when your child consumes a lot of empty calories through fast food and sodas.

7. Psychological problems

- Research has revealed that around 50% of mental health disorders that adults have, begin at the age of 14. In fact, one-third of adolescent deaths are suicides triggered by depression. If your child is overly moody and is not eating or sleeping at all, it is imperative you get professional help for them.



- The most common mental health disorders observed during adolescence are anxiety and mood disorders. Social phobias and panic disorders are common among this age group. Girls may tend to have more vulnerability to develop depressive disorders than boys.
- Teenagers may have self-esteem or confidence issues. The feelings of inferiority or superiority often arise from their appearance, and acceptance of their body – skin colour, beauty, and figure.
- Poor performance in academics and low IQ can also demotivate them. They develop the 'I'm not good enough' attitude towards life.
- Depression is one of the common psychological problems associated with adolescence.
- The stress and pressure of adolescence can create anxiety related issues, while mood swings can lead to conduct disorder or oppositional defiant disorder.
- Eating disorders are also psychosomatic as they start with the adolescent having a poor self-image and the need to change the way they look by any means.

8. Social problems – dating and relationships

- Attraction to the opposite sex begins during puberty. Adolescence is the time when their sexual or reproductive organs start developing. At such a vulnerable time, it is but natural for teens to feel awkward in social situations.
- Teenagers want to have an identity of their own. They tend to look up to role models at home or outside.
- Adolescents also start thinking about what is 'right' and 'wrong' and question your take on certain things.
- They need time to understand and get comfortable with their sexuality. Girls and boys start experiencing 'weird' feelings towards the other sex and may not know what to do about it.
- This is the time they start dating. Your adolescent may not be comfortable talking to you about it and may go with little information or misinformation they have about it.
- Competition is another important aspect of a teenager's social life. Your child may compete with her peers in anything and everything. Their spirit of competition speaks a lot about their perception of self – whether they have a positive self-esteem or a negative one.
- Sexual feelings and thoughts of sex may seem wrong to an adolescent, because of which they may feel guilty.
- Their social circle expands during this time as they seem occupied interacting with friends on social media sites, through their phone and outside.

9. Sexual health – unplanned pregnancy and STIs

- The development of secondary sexual characteristics during adolescence gives rise to new feelings in teenagers and pushes them to experiment with their bodies.
- Adolescence is the time when teens experience their first kiss, the intimate dance with their 'boyfriend' or 'girlfriend' and secret make out sessions.
- Without proper guidance, teenagers may become sexually active before they are ready. This could result in unwanted pregnancies. Unwanted pregnancy is the biggest risk that adolescent girls face.
- Unprotected sex can also lead to sexually transmitted diseases like HIV.

*Notes***10. Addiction to cyberspace**

- The advent of social media has changed the way we interact with each other. It has affected teenage lifestyles the most.
- Your teen may seem to spend hours on phone, texting, talking or simply playing.
- Adolescents addicted to the internet tend to have fewer friends and a less active social life. They lead solitary lives and are happy browsing the internet for hours. Addiction to cyberspace also cuts short their physical activities, resulting in an unhealthy and sedentary lifestyle.
- Internet addiction adversely impacts academic performance.

11. Aggression and violence

- Aggression is especially a concern with adolescent boys. Young boys start to develop muscles, grow tall and have a coarser, manly voice. In addition to that, they are moody and vulnerable and can let others get under their skin.
- Adolescent boys can get into fights at school.
- Worse, they could start bullying others, which is a major problem that adolescent boys and girls have to deal with.
- Boys may fall into bad company and be drawn to acts of violence, vandalism, and aggression. They could be easily swayed to own or use a firearm or a weapon too.
- Impulse acts of violence can lead to serious consequences, including death. According to the WHO report, interpersonal violence causes around 180 adolescent deaths around the world.
- Teenage girls are likely to suffer violence or aggression by a partner.

SUMMARY

Adolescence is derived from the Latin word “adolescere” meaning to grow into maturing. The World Health Organisation defines adolescence as any person between the age of 10 and 19. It is between child-hood and adulthood and is closely related to the teen age years. Adolescence may be divided into three stages namely pre adolescence, early adolescence and late adolescence. The period of adolescence is extremely important in one’s life because at this stage, one moves from childhood to the onset of maturity. In every period of development from birth onwards a person may face many challenges due to the changes that occur during that period. Each phase in life has distinct characteristics. Adolescence is known as a problem age because they are faced with many challenges that arise due to the anatomical, psychological changes. This is further enhanced by peer pressure and conflicts with parents and elders. Most of these problems are aggravated due to misleading and misguiding parents, teachers and friends, ignorance of elders, being half informed or ill-informed about the realities in life and wrong messages and concepts depicted through the media.

*Notes***Multiple Choice Questions**

1. Which of the following should an adolescent choose for his/her meal?
- A. Chips, noodles and aerated beverages
 - B. Vegetable cutlets, chips and lemonade
 - C. Rice, noodles and popcorn
 - D. Chapathi, dal and vegetables

Answer: (D) Chapathi, dal and vegetables

2. The reproductive phase of a woman lies between her _____ and menopause.
- A. menstrual cycle
 - B. menstruation
 - C. menarche
 - D. ovulation

Answer: (C) menarche

3. Statement 1: Sweat glands, salivary glands and oil glands do not release their secretions directly into the blood.
Statement 2: These glands do not have ducts.
- A. Both the statements are correct.
 - B. Only statement 2 is correct.
 - C. Both the statements are incorrect.
 - D. Only statement 1 is correct.

Answer: (D) Only statement 1 is correct.

4. Number of sex chromosomes in a human kidney cell is
- A. One pair
 - B. Two pairs
 - C. Three pairs
 - D. Four pairs

Answer: (A) One pair

5. A female gamete carries _____ chromosome(s).
- A. one Y
 - B. one X and one Y
 - C. two X
 - D. one X

Answer: (D) one X

Review Questions

1. What do you mean by adolescents?
2. What is motor development?
3. What is language development?
4. What is sex education?
5. Explain the problems faced by adolescents?
6. Explain the characteristics of social and emotional development of adolescence?



Notes

19 ADOLESCENCE

Concerns and issues in human development: position of the girls child in society, juvenile delinquency, child lab or socio-economically disadvantaged children, major physical Disabilities, mental retardation, safe motherhood, HIV/AIDS.

- Understand the concept of HIV/AIDS.
- Understand the concept of juvenile delinquency.
- Understand the concept of safe motherhood.
- Understand the concept of mental retardation.
- Discuss the position of the girl's child in society.

Objective of the chapter:

The basic objective of this chapter is to through some light on the issues and concerns in human development so that the various recent problems related to human development can be learned.

Concerns and issues in human development

Position of girl child in society

This stuff matters to men, as well.

1. Access to Education

A 2013 report by UNESCO found that 31 million girls of primary school age were not in school, and about one out of every four young women in developing countries had never completed their primary school education. That number represents a huge pool of untapped girl power: that same report suggests that educated women are more likely to get married later, survive childbirth, raise healthy kids, find work, and earn more money, among other positives.

2. Employment Opportunities

Even in a country as wealthy and developed as the US, women still experience major inequality in the workforce: By some estimates, women earn only \$0.77 for every \$1 earned by men. Globally, the gender gap is even wider: women earn only one tenth of the world's income despite working two thirds of the total work hours. Empowering women to earn their fair share could benefit their entire communities in a big way: women are likely to invest more of their money back into their families and communities than men typically do.



Notes

3. Reproductive Health & Rights

225 million women in developing countries have an unmet need for family planning, contributing to 74 million unplanned pregnancies and 36 million abortions every year, according to figures cited by Women Deliver, a women's advocacy group. Helping women take charge of their baby-making reduces unsafe abortions and maternal deaths by over 70% each, and conserves precious resources that would otherwise have gone toward pregnancy-related costs.

4. Maternal Health

The World Health Organization estimates that 800 women die everyday from preventable, pregnancy-related causes. That's nearly 300,000 lives per year needlessly lost during what is fundamentally a life-creating event. What more is there to say?

5. Gender-based Violence

1 in 3 women experience physical or sexual violence in their lifetimes, according to WHO. Whether it's domestic abuse, rape, or sexual trafficking, gender-based violence denies far too many women the opportunity to live happy, healthy, and fulfilling lives.

6. Child Marriage

An estimated 140 million girls will become child brides between 2011 and 2020. Girls who marry before age 18 are typically denied an education, at risk of complications related to premature childbearing, and more vulnerable to intimate partner violence.

7. Female Genital Mutilation

Female Genital Mutilation (or FGM), defined by WHO as including "procedures that intentionally alter or cause injury to the female genital organs for non-medical reasons," is a complex issue with religious and cultural implications for the groups who practice it. That said, the general consensus in the international community is that FGM imposes real health consequences, violates a child's rights, and promotes inequality between the sexes.

8. Water & Sanitation

When clean drinking water and hygienic sanitation facilities are in short supply, women and girls suffer most. Case in point: Girls whose schools lack proper bathrooms will often skip school during their menstrual periods for fear of embarrassment or stigma. It's also true that women in developing countries are frequently tasked with fetching water, which can be a time-consuming process. As my colleague Christin pointed out, the girls and women of the world have much better things to do with their time than shuttle buckets around.

9. Gender Equality

Equality (or the lack thereof) is a recurring issue when it comes to women and girls, whether it's unequal access to schooling for girls in developing countries, or unequal pay for women in the workplace. In a world where 95% of countries are led by a male head of state, it's clear that we as a global community have a long way to go before women are given a fair shake. While the 9 issues outlined above are specific to girls and women, addressing them will



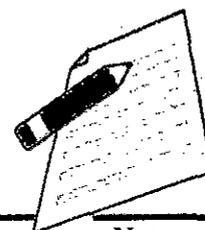
positively impact everyone. Stay tuned to Global Citizen all month as we explore the many ways in which a win for girls and women is a win for us all. **Children with Special Needs**
All children are 'unique' yet similar to one another in most aspects of growth.



However, some children are very different from their age-mates that they 'stand out'. Such children have to deal with the normal/usual problems of growth along with all those difficulties that may arise because of being 'different'. The child is unable to deal with the social and emotional problems associated with it. This has marked effect on the child's personal and social development.

Normal Child and Disabled/ Disadvantaged Child

A normal healthy child is able to grow and do things to equip him/her for future life. A child who is not able to withstand the challenges of day-to-day life is generally referred to as handicapped/disabled or disadvantaged children. They are also known as children who are 'differently abled'.



Baker, a well-known psychologist defines the disabled child as “one who deviates from what is supposed to be an average child in physical, mental, emotional and social characteristics to such an extent that the child requires special educational services to help develop to the maximum capacity”.

Categories of Disabled/Disadvantaged

Children:

The disabled children can be broadly grouped into three categories. These are:

- i. Physically disabled children.
- ii. Mentally disadvantaged children.
- iii. Socially maladjusted children.

Causes of Disability among Children:

The various causes of physical disability are as follows:

- Heredity
- Unfavourable environment
- Injury during child birth
- Accidents during early childhood causing orthopaedic problems.
- Surgery requiring the amputation of the diseased part.
- Mental and emotional problems in early childhood result in stammering, stuttering and speech defects.
- Ear infections and injuries resulting in hearing defects.
- Psychological, emotional problems and feelings of neglect result in behavioural problems.

1. Visual Impairment:

Vision is a critical tool that children use in obtaining information about the world in which they live. Impairment of vision can lead to partial or total blindness. The children with visual impairment will need special materials and attention to develop fully.

Causes of Visual Impairment

Visual impairment can be caused by the following factors:

a. Congenital Blindness:

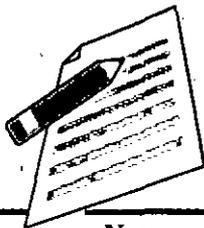
It refers to a child being born blind.

b. Acquired Blindness:

In this case the child is not born blind. The child may lose eye-sight on account of some accident. The resulting eye-defect is called acquired blindness.

c. Nutritional blindness:

It is a result of prolonged absence of vitamin-A rich foods in the diet. Deficiency of vitamin-A causes dryness of eyes, (xerophthalmia) and impaired vision in dim light (night blindness).



Special Needs of a Visually Challenged Child:

Physical Needs:

Parents of a visually challenged children have to give special attention and train their children to do their daily routine jobs like toilet, bath, dressing and feeding etc. Special effort is needed to help them to move around the house without knocking things and hurting themselves.

Emotional and Social Needs:

Parents and siblings need to develop social contact and provide constant reassurance by hugging, petting and reassuring the handicapped child when scared and emotionally upset.

Educational Needs:

Books with big print and a desk with proper light and recorded tapes are of considerable help to the child with defective vision. The special tool called "Braille" is also helpful.

The Braille dots are punched out one at a time from right to left. Children learn to use Braille with ease once coached properly.

2. Hearing Impairment

Definition

A child with hearing impairment is one who has lost the sense of hearing before learning the language. This means that the child is born without the ability to hear. Such children are often mute and silent.

Hard of hearing on the other hand is a defect that is acquired later in life. The child experiences varying degrees of hearing loss.

Causes of hearing impairment

Hearing impairment and loss can be due to the following factors:

(a) Conductive hearing impairment

The passage of air in the outer ear is called the 'Conductive Pathway'. The conductive pathway can get affected due to

- i. Build-up of wax in the ear,
- ii. A foreign body in the pathway
- iii. Any swelling of the outer ear.

These conditions can cause temporary hearing impairment that can be medically treated.

(b) **Sensory Neutral hearing loss** is due to the damage of the ear drum, cochlea, auditory nerve and the associated brain cells.

(c) **Mixed Hearing Loss** is a result of hearing impairments arising due to a combination of conductive and sensory neural defects.

Characteristics of a Child with Hearing Impairment:

- The child may be speech impaired besides having hearing impairment.
- They may have difficulty in learning language/vocabulary. It is an enormous challenge to learn to communicate in a language one cannot hear.



Special Needs of a Child with Hearing Impairment

Hearing defects cause a lot of problems ranging from language and vocabulary to comprehension and communication. Physical needs can be effectively taken care of by providing physical comfort. Parents can use play way techniques to help child.

Emotional and Social Needs:

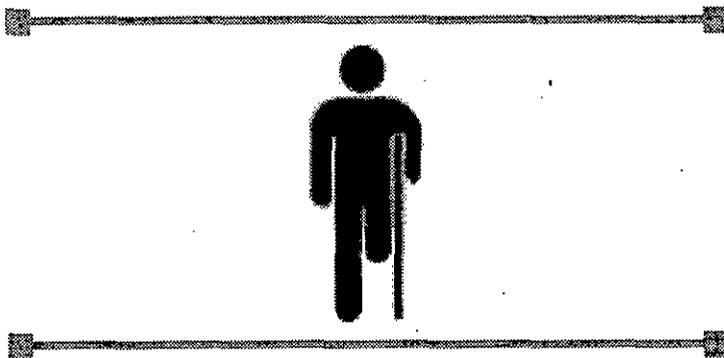
Suspicion is almost the second nature with deaf children. Their social behaviour also needs to be improved and refined. Love and affection provide emotional security besides the much-needed encouragement for better learning.

Educational Needs involve child's ability to understand the language. They learn to communicate through visual and manual means.

- **Oral Method or Lip-Reading** is a slow method involving a lot of patience for the learner as well as the educator.
- **Manual Method or Sign Language** helps the child to communicate with gestures, cues and finger-spellings.

3. Orthopaedic Impairment

A child with an affected limb is not able to fully perform the activities involving the use of bones, muscles and joints. Similar handicap is experienced by children with a missing limb. Such children are known to be orthopedically crippled.



Characteristics of A Child with Affected / Missing Limb

- Physical defect leads to inferiority complex among young children.
- The feelings of inadequacy result in self-pity.
- The child often goes through psycho-logical trauma because of discrepancy between his/her aspirations and the ability to perform.

Special Needs of Children with Missing / Affected Limbs

Physical Needs consist of being able to cope with one's daily routine. The attitude of parents should help the child do his/her duties independently rather than "do things for them". Use of special contraptions like callipers, shoes and artificial limbs along with proper training has yielded very good results. Use of crutches and wheel chair improves the mobility besides boosting their confidence.

*Notes*

Social and Emotional Needs. Children with affected limbs are very often left out of social group activities. The child may feel frustrated, dejected and neglected. Loving care and proper training to be independent and self-reliant are the basic needs of all handicapped children.

Educational Needs involve and include such activities that require 'doing'. Writing, playing, drawing, painting, knitting and even dancing are some such activities.

4. Children with Impaired Speech

The main purpose of speech is effective communication. When speech is defective communication is also defective.

Causes of Speech Defects

There are many causes for speech defects.

They are as follows:

- i. **Physiological causes:** Defects and deformities of the larynx and the vocal cords affect the speech produced. Incomplete development of the skull and head produces a cleft palate and cleft lip which produce speech defects
- ii. **Neurological causes.** When nerves connected with the areas of speech and learning process are impaired, some type of speech defect or disorder of articulation occurs
- iii. **Psychogenic Causes.** These are causes related to one's mind. Some types of stuttering are purely psychogenic in origin. General self-consciousness added with speech defect may produce stuttering.
- iv. **Sociological causes.** Some speech habits such as too rapid or too slow speech, or speaking in the low tones insisted by the parent may lead to speech defects.

Special need of children with speech defects

Physical needs

Surgery can correct some of the physiological causes like cleft palate, extremely enlarged tonsils, adenoids, etc. Motor activities, dramatic play of all kinds, excursions, discussing and planning group activities will help in developing correct speech patterns.

Educational Needs

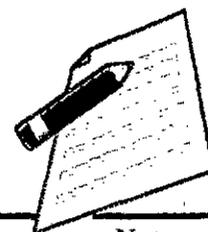
Classes under special teachers will be useful for correction of pronunciation

Emotional needs

Children should be given opportunities to listen to stories. The teacher and parents should always make it a point to pronounce words clearly themselves.

5. Mentally Challenged Children

The intelligence possessed by a normal individual is said to be between 90 and 110 I.Q. Some children possess less than average intelligence and they are said to be mentally challenged or mentally handicapped.



Notes

Meaning of I.Q.

The letters IQ stand for Intelligence Quotient. It is a measure of intelligence. The formula used to calculate the I.Q. is $MA/CA \times 100$. MA stands for Mental Age and CA stands for Chronological Age. The mental age of a person is found out by intelligence tests. If the mental age corresponds with his chronological age or the physical age, then his mental growth is said to be normal. The mentally retarded children have a lower mental age than their chronological age.

Classification of mentally challenged people

Depending on the I.Q. possessed, mentally challenged people/children are classified as slow learners, challenged, moderately challenged and severely challenged.

Children who are mildly retarded are referred to as educable. Those who are moderately challenged are called train-able. Those who are severely and profoundly challenged are called totally dependent.

The characteristics of mentally challenged children

- Physical traits- For majority of them, their height and weight is normal for their respective ages. Muscular control is fairly well developed. Senses are well developed but occurrence of speech defects such as stammering and lisping is fairly large among these children.
- Other traits- Socially they are found to be less adjustable. Vocabulary is very much limited. They find adjustment to new situations difficult.

Causes of Mental Challenges in Individuals

The causes may be endogenous or exogenous.

Endogenous typemainly consistsof hereditary conditions. Defect in the germ cell produces a retarded condition called microcephaly. Defects in the nervous system and weaker nerve potential inherited also lead to mental challenges. Marriage between men and women who are close blood relatives is said to lead to mental challenges in their children.

Exogenous causesfor mentalchallenges include venereal diseases in the mother, brain injury at birth and various forms of anoxia at the time of birth. Toxic conditions in older mothers during pregnancy causes mongolism. Thyroid deficiency in children causes cretinism or dwarfism. Brain injury due to accidents, brain fever in the new born, also lead to mental challenges after birth.

Needs of Mentally challenged Children.

Proper prenatal care including immunization, good diet, and medical check-up delivery attended by a trained person, preferably hospital delivery and proper weaning foods for the baby will reduce the incidence of individual attention and instruction. In the case of slow learners, they need more help and stimulation. The teacher needs to give clear direction and encouragement. The learning process must be made simple and more of concrete examples must be used.

JUVENILE DELINQUENCY

Delinquency is a problem associated with the period of adolescence. It is engaging in activities which are against law and are punishable. When a delinquent act is committed by a child or young person before the age of 18 it is called juvenile delinquency.



A list of delinquent acts by minors include committing theft of valuables, burglary, looting, black mailing, murdering, raping, leading immoral life like prostitution, drinking, gambling, smuggling, drug addiction and anti-social acts like damaging public utilities etc.

Causes of delinquency

- i. **Personal causes**-A person's physical defects, aggressiveness and low intelligence make a person prone to delinquency.
- ii. **Family causes**-Children from broken homes lack love and affection and a feeling of security. They tend to seek the comfort from peers involving antisocial activities
- iii. **Community factors**-Numerous of community factors are proved to instigate the adolescents towards delinquency. They are
 - a. **Poor housing** -Poor housing is a symbol of poor economic and social status. Overcrowding in poor houses and lack of privacy is said to be a cause for committing sex offences.
 - b. **Poor recreational facilities** -Inabsence of good recreational facilities, delinquency itself becomes a recreational activity.
 - c. **Poor schools** -Many factors inschool contribute to delinquency. Nagging by peers, lack of under-standing from teachers, unhappy home- school relationship make children dislike the school and engage in antisocial behaviour
 - d. **Unemployment**- Unemploymentamong school dropouts and those who have no secured jobs tend to cause delinquency.
 - e. **Movies and comic books**-Crime, gangster movies, glamour and sex movies stimulate young people to commit offences.



Prevention of delinquency

- Satisfactory adult-adolescent relation-ship, absence of feeling of rejection and presence of love and affection among members of the family will be of much help in preventing delinquency.
- Community efforts by parent teacher's association, schools, religious institutions, social workers, counsellors and voluntary organizations play a major role in guiding children.



- Mass media such as radio, television and newspaper should educate parents and the society on proper treatment of children.
- Educational Institutions can have programmes such as “Earn While You Learn” by engaging adolescents in useful activities.

HIV/AIDS AIDS or acquired immunodeficiency syndrome was first described in 1981 following the recognition of a group of homosexual males suffering from pneumocystis pneumonia and Kaposi’s sarcoma. Two years later the causative human immunodeficiency virus (HIV) was isolated. Rapid advances in therapy have changed the natural history of the disease however various clinical states are recognised:

- Primary HIV infection/acute HIV infection/acute seroconversion
- Clinical latency, +/- persistent generalised lymphadenopathy (PGL)
- Early symptomatic infection/AIDS related complex “B symptoms”
- AIDS (criteria include a CD4 cell count below count $<0.2 \times 10^9/L$)
- Advanced HIV infection

Centre for Disease Control in the United States (1993).

In the developed world due to combination antiviral therapy, AIDS is very rarely seen except in undiagnosed patients who present with an AIDS defining diagnosis. It is however still a major problem in the developing world.

Incidence/prevalence

Epidemiological data collated by the World Health Organisation suggests that around 34,000 people in the United Kingdom were living with HIV in 2001. In the same year HIV accounted for 460 UK deaths. Worldwide however it is estimated that in 2002 42 million people were living with HIV, almost 35 million of whom live in SubSaharan Africa and South & South East Asia. 3.1 million people worldwide died of HIV and related illnesses in 2002.

Aetiology/patho physiology

HIV is a retrovirus, an RNA virus that uses a reverse transcriptase enzyme to create a double stranded DNA copy of its genome, which then integrates into the host’s genome. At present two virus families are recognised, HIV-1 and HIV-2 with 40% homology (see Fig. 12.17).

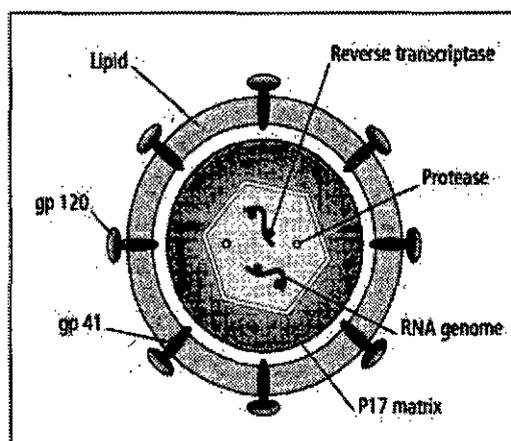


Figure 12.17 Schematic representation of HIV-1.



- HIV-1 varies with three genetic groups (M – Major, O - Outlier, N – non-M non-O). The M group is further divided into 10 subgroups (A–J).
- HIV-2 is endemic in West Africa. HIV gains access to cells via a viral surface glycoprotein termed gp120 which interacts with CD4 on helper T lymphocytes and macrophages.

A co-receptor for T-cells and macrophages has been identified as chemokine receptor (CCR5), mutations in which may prevent cell entry and hence give some resistance to viral infection. A similar co-receptor on all lymphoid cells (CXCR4) has also been identified.

Replication cycle

Human infection is usually with macrophage tropic (R5) viruses. HIV infected macrophages then fuse with CD4+lymphocytes allowing the virus to spread. Once in the blood stream widespread dissemination occurs. An immune response to the virus results in a decrease in detectable viraemia followed by a prolonged period of clinical latency. The CD4+T cell count gradually decreases during this clinical latency, until levels fall to a critical level below which there is a significant risk of opportunist infections.

Following binding between gp120 and CD4 HIV is uncoated and its RNA is released into the cell cytoplasm. The action of viral reverse transcriptase converts the single stranded RNA genome to double stranded DNA, which is then transported to the cell nucleus and integrates into the host's chromosomal DNA. The proviral DNA is then transcribed, translated and the product assembled as if it were a normal cell constituent.

The resulting new virion is then released from the T-cell (see Fig. 12.18).

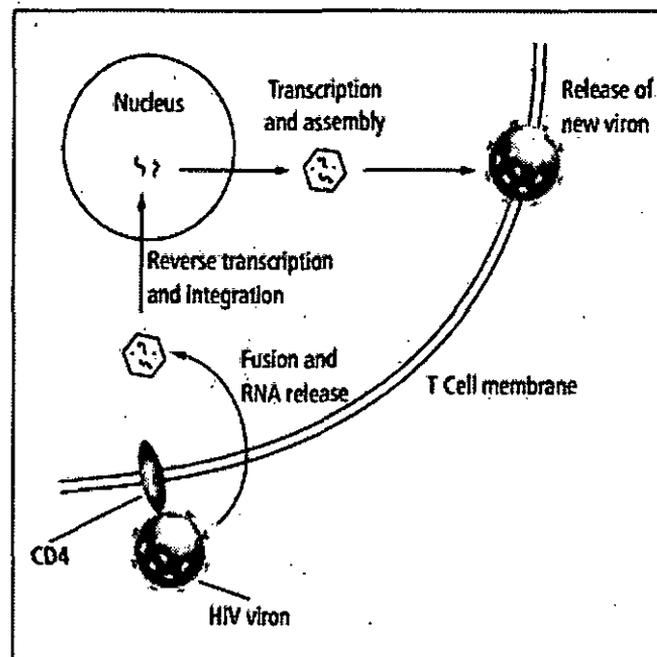


Figure 12.18 The HIV replication cycle.

Transmission is by sexual intercourse (vaginal/anal), vertical transmission, blood products, intravenous drug use or by needle stick injury. Transmission cofactors include viral load, intercurrent sexually transmitted disease, exposure intensity, sexual practices and drug injecting practices.



Notes

Clinical features

Primary HIV infection/acute HIV infection/acute seroconversion: Many patients are asymptomatic but may develop symptoms 2–8 weeks after exposure with fever, generalised lymphadenopathy, pharyngitis, rash, arthralgia, myalgia, diarrhoea, headache, nausea and vomiting. This illness is clinically difficult to distinguish from glandular fever. Rarely a neuropathy or an acute reversible encephalopathy (disorientation, loss of memory, altered personality and conscious level) may occur. These manifestations are self-limiting lasting up to 2 weeks from onset.

Clinical latency: Following seroconversion the viral load and CD4 count varies until 6 months when it stabilises at a level correlating with prognosis. During this latent period most patients are asymptomatic, although the majority have symptomless persistent generalised lymphadenopathy (PGL) defined as enlarged lymph nodes involving two or more non-contiguous sites other than the inguinal nodes.

Symptomatic HIV infection and AIDS:

The Centre for Disease Control in the United States has produced a classification for HIV infection based on clinical state and the absolute CD4+ve T cell count (see Table 12.12). The patient's clinical state is divided into

1. Acute seroconversion/asymptomatic/persistent generalised lymphadenopathy (PGL).
2. Presence of 1 or more B symptoms (see Table 12.13).
3. Presence of an AIDS defining illness (see Table 12.14).

Table 12.12 Clinical categories

CD4 count	Clinical State		
>500/mm ³	A1	B1	C1*
200–499 /mm ³	A2	B2	C2*
<200/mm ³	A3*	B3*	C3*

*Patients defined as having AIDS.

Table 12.13 Examples of B symptoms/conditions

- Bacillary angiomatosis
- Cervical dysplasia / carcinoma in situ
- Constitutional symptoms (fever >38.5°, diarrhoea) lasting >1 month
- Herpes zoster that is recurrent or affecting more than 1 dermatome
- Idiopathic thrombocytopenia purpura
- Listeriosis
- Oral hairy leucoplakia
- Pelvic inflammatory disease with tubo-ovarian abscess
- Peripheral neuropathy
- Persistent, recurrent or refractory vaginal candidiasis



Notes

Table 12.14 AIDS defining illnesses 1993

Candidiasis of oesophagus or lower respiratory tract
Invasive cervical carcinoma
Extrapulmonary coccidiomycosis, cryptococcosis
Chronic cryptosporidiosis or isosporosis with diarrhoea
Cytomegalovirus other than affecting reticuloendothelial system
HIV associated dementia
HIV associated generalised wasting
Kaposi's sarcoma
Lymphoma Burkitt's, immunoblastic or brain lymphoma
Mycobacterial infection (tuberculosis, avium, kansasii)
<i>Pneumocystis jirovecii</i> pneumonia
Recurrent bacterial pneumonia
Progressive multifocal lymphadenopathy
Recurrent salmonella septicaemia
Toxoplasmosis of internal organs

Infections and HIV

Candidiasis: The commonest appearance is of pseudomembranous creamy plaques which may be wiped off (distinguishes from leukoplakia) to reveal a bleeding surface. Infection of the distal oesophagus may cause retrosternal chest pain and dysphagia, or may be asymptomatic. Diagnosis is made on barium swallow or endoscopy. Treatment is with systemic anti-fungals such as fluconazole.

Oral hairy leukoplakia is due to an opportunistic infection with Epstein Barr virus within the oral mucosa. It appears as unilateral whitish plaques on the side of the tongue. In the majority of cases no treatment is required, any coexistent candida should be treated, aciclovir may help although invariably it recurs.

Toxoplasmosis causes encephalitis and abscesses in immunodeficient patients. Infections are due to reactivation of previously acquired infection. Patients present with headache, confusion, personality change, focal neurological signs, seizures and reduced consciousness. Fever may be absent. CT/ MRI shows multiple masses, often with ring enhancement and surrounding oedema. Treatment is with pyrimethamine and sulphadiazine.

Cryptosporidium parvum is transmitted by the faecal-oral route and causes watery diarrhoea, colic, nausea, vomiting and a severe fluid/electrolyte loss with severe weight loss. Stool microscopy shows cysts, stained with Ziehl Neelsen stain. Patients require rehydration. There is no satisfactory treatment.

Cryptococcus fungal infection in HIV presents most commonly with meningitis. Patients present with headache, fever, impaired conscious level and abnormal affect. The classical neck stiffness and photophobia are rarely seen. A CT scan should be performed to exclude space occupying lesion prior to lumbar puncture. CSF is stained with Indian ink, serum and



Notes

In general, two nucleoside-analogue reverse transcriptase inhibitors with one drug from either of the other two classes are used as first line treatment. Treatment is tailored according to compliance, side effects and the response to treatment.

Prevention strategies include safer sexual practice (reducing the number of sexual partners, use of barrier contraception), needle exchange programmes, screening of donor blood, semen and organs. Strategies to reduce vertical transmission include screening, caesarean delivery, maternal and neonatal anti-retroviral treatment and avoidance of breast-feeding. Health-care workers also require education, careful disposal of sharps and prophylaxis following needle stick injuries.

Prognosis

Untreated the life expectancy of an HIV infected individual is approximately 10 years. A few individuals are classified as long term non-progressors with normal CD4 counts and low viral load in the absence of treatment. Prognosis has been dramatically improved by combination antiretroviral therapy, and life expectancy is likely to be more than doubled by this treatment.

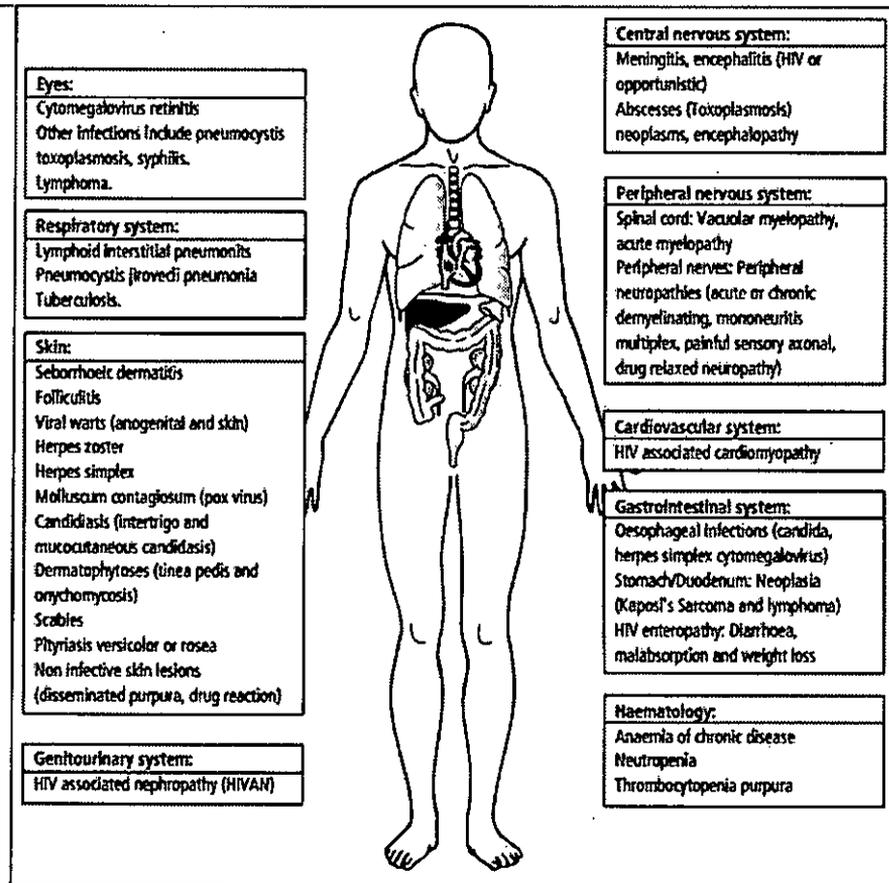


Figure 12.19 Systemic manifestations of HIV and AIDS.

SUMMARY

A 2013 report by UNESCO found that 31 million girls of primary school age were not in school, and about one out of every four young women in developing countries had never completed their primary school education. That number represents a huge pool of untapped girl power:



that same report suggests that educated women are more likely to get married later, survive childbirth, raise healthy kids, find work, and earn more money, among other positives. Even in a country as wealthy and developed as the US, women still experience major inequality in the workforce: By some estimates, women earn only \$0.77 for every \$1 earned by men. Globally, the gender gap is even wider: women earn only one tenth of the world's income despite working two thirds of the total work hours. Empowering women to earn their fair share could benefit their entire communities in a big way: women are likely to invest more of their money back into their families and communities than men typically do. AIDS or acquired immunodeficiency syndrome was first described in 1981 following the recognition of a group of homosexual males suffering from pneumocystis pneumonia and Kaposi's sarcoma. Two years later the causative human immunodeficiency virus (HIV) was isolated.

EXERCISE

Review Questions

1. Explain the position of girl child in society?
2. What is HIV?
3. What is AIDS?
4. Explain the concept of Juvenile delinquency?
5. Explain the major physical disabilities in detail?
6. What is mental retardation?



Notes

20

FABRIC SCIENCE

- Understand the concept of fabric.
- Understand the meaning and scope of fabric science.
- Understand the concept of fibre.
- Understand the classification of fibre.
- Discuss the properties of fibre.
- Understand the selection of textile and clothing.
- Discuss the storage of clothing.

Objective of the Module:

The basic objective of this chapter is to throw some light on the initial concepts of fibre science so that the classification and properties of fibre can be learned.

Scope of Fabric Science

Just look around you and pinpoint all the fabrics in your room. You will find that you are not only wearing a fabric, but also sitting on it and perhaps, have a piece of fabric hanging on the wall as a wall hanging or as curtains on the doors.

Fabric Science means that fabrics not only make your clothes but are also used at home and outside. Can you think of some more uses of fabric? Yes, you are right. Some of the other uses of fabrics at home are in the kitchen as napkins, in the bathroom as towels, on the beds, sofas, and even on our floors as carpets. Fabrics also offer many uses in industry, medical field and even in automobiles.

What is a fabric?

A fabric is any piece of cloth. A study of all the aspects of a fabric is called fabric science and it explains the behaviour of a fabric under different conditions. You must have realised that different fabrics are not only different in their appearance but also in their properties, uses and their care procedures. Silk is smooth and shiny; cotton is smooth but dull. Wool is rough, but keeps you warm and cotton is cool to wear. Cotton can be washed easily but needs to be ironed after washing for a neat look. Nylon and polyester also are washed very easily and need almost no ironing after washing. Silk is either dry cleaned or washed with gentle soaps. These and many more concepts of fabrics are explained in fabric science. The market today is flooded with variety of fabrics in all types of colours, textures and designs. They all vary in their price range as well. To be an intelligent consumer, an exposure to fabric science is important as it helps us to understand a fabric better.

FIBRE

Have you ever wondered what makes a fabric? Find out yourself. Pull out a thread from a fabric and then open it out. You will find that this thread is made of small hair like strands twisted together. This single hair like strand is called a fibre. In other words, the basic unit of a fabric is a fibre.

Classification of Fibres

1. Fibres come as short fibres and long fibres and their length is an important property of fibres. To see a short fibre, take a ball of cotton and pull-out fibres from it. Notice that these fibres are quite small. Now try and pull-out fibres from a nylon fabric. These, you will see, are longer fibres. The short fibres are called staple and the long ones are called filament.
2. Fibres also can be classified according to their origin. Some fibres are obtained from natural sources i.e., from plants, animals or minerals. These are called natural fibres. The other fibres are manmade.

a) **Natural Fibres:** – There can be vegetables fibres, animal fibres and mineral fibres. Let us study these in detail.

(i) **Vegetable Fibres** that come from plants are called vegetable fibres and can be obtained from different parts of a plant. You must have seen the white cotton fibres growing on plants. These are the seed hair fibres. Cotton is an example of seed hair. Similarly, fibres can be obtained from the stem of a plant e.g., jute and flax, and from the leaves like pineapple fibres. Fibres are also obtained from the outer covering of a fruit, like coir from coconut husk. All the plant fibres are made up of cellulose.

(ii) **Animal Fibres** Can you name the animals which give us fibres? Sheep is the most common animal whose hair is used as wool. Some other animals are camel, goat, and rabbit. Silk is also an animal fibre. It is the secretion of an insect called the silkworm. Do you know that silk is the strongest natural fibre? The animal fibres are made up of proteins.

(iii) **Mineral Fibres** Natural fibres obtained from the minerals are called mineral fibres, e.g., asbestos. You must have seen sheets of asbestos being used as rooftops. Can you think of other uses of asbestos? It is used by fire fighters as clothes because it is fireproof. Natural fibres are usually staple fibres with the exception of silk which is a filament fibre.

(b) **Manmade Fibres**

There is another class of fibres called the manmade fibres. As the name suggests these fibres are not obtained directly from nature but made by using chemicals.

Manmade fibres are of two types: 1. Regenerated fibres 2. Synthetic fibres

Let us find out more about man-made fibres. (i) **Regenerated fibres** These are made from natural raw material e.g., cellulose, (waste cotton fibres or wood pulp) or protein depending upon the fibre to be made. This natural raw material is regenerated with the help of chemicals. Rayon is a regenerated cellulose fibre. (ii) **Synthetic fibres** on the other hand Synthetic fibres are obtained from chemical substances and are totally synthetic in nature, e.g., Nylon, Polyester, Acrylic (Cashmilon). Manmade fibres are generally filament fibres. Of course, they can always be cut in to small pieces to form staple fibre, if required.





General Properties of Fibre

Introduction:

Textile fibres are materials of natural or artificial origin which can be converted into yarn and fabric for clothing.

Fibre is defined as a fine strand of tissue of plants or animal or any synthetic material drawn out into very slender filament and subsequently cut into required length.

General properties of fibre required for ideal textile:

Essential properties:

i) staple length :

Staple length is one of the most important qualities of natural fibres. Longer fibres provide stronger yarn and gives higher production in ring spinning. If the fibre length is more varying in given sample, the quantum of short fibres increases and lower the yarn strength and increases the yarn irregularity. The unit of length is mm, cm, inch.

ii) Tensile Strength :

Weak fibres cannot produce a stronger yarn. Individual fibres must have sufficient strength to withstand normal mechanical strain in the processing. The resistance of a fibre to use and wear considerably depends on its tensile strength. It is expressed in terms of tenacity and units is grams/tex.

iii) Fineness :

In a fibre, the ratio or relationship of length to width or cross-sectional area is expressed as its fineness. In coarse fibres the length is about 700 times more than width. The ratio may be even 5000 in case of fine fibres. Only fine fibres can produce finer yarn. It is expressed in terms of micrograms/inch or micronaire value.

iv) Uniformity :

This means the evenness of individual fibres in length and diameter. A fibre possessing this property can produce reasonably even threads. This is also important in connection with the strength of resulting yarn. The more uniform fibres will produce stronger yarn.

v) Spinnability :

It means the ability of the fibres to be spun into yarn. In addition to the above fibre properties the capacity to take up twist also place an important role in the spinnability of a textile fibre.



Notes

21

YARN AND ITS
CONSTRUCTION**Introduction:**

To convert textile fibres into fabrics some type of fiber arrangement is required. Probably the most common method is to convert fibres into yarns, which are then constructed into fabrics. Yarns are essential for knitted, woven or knotted structures and for many braided ones. 'Yarn' is defined by the American Society for Testing and Materials (ASTM) as 'A generic term for a continuous strand of textile fiber, filament, or material suitable for knitting, weaving to form a textile fabric. Yarn occurs in the following forms.

TYPES OF YARNS:

Yarns can be made either from short staple length fibres or from filament fibres. There are two types of yarns, i.e., spun yarns and filamentous yarns.

Types of Yarns:

1. Spun Yarns
2. Filament Yarns

If filaments are used to make yarns, they may be either multifilament or monofilament.

Filamentous Yarns

1. Monofilament
2. Multifilament -> Twisted, Flat

Mono filaments are filament yarns composed of one single filament.

Multi filaments are composed of many filaments.

Characteristics of Spun Yarns and Filament Yarns**Spun Yarn**

1. Yarns made from short length fibers and the fabrics are like cotton and wool.
2. Short fibers twisted into continuous strand, has protruding ends
 1. Dull, fuzzy look
 2. Lint
 3. Subject to pilling
 4. Soil readily
 5. Warm (not slippery)
 6. Loft and bulk depend on size and twist
 7. Do not snag readily



Notes

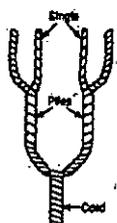
8. Stretch depends on amount of twist.
3. Are absorbent
4. Size often expressed in yarn number
5. Various amount of twist used
6. Most complex manufacturing process

Filament Yarn

1. Yarns made from long length filament fibres and fabrics are like silk.
2. Long continuous, smooth, closely
3. packed strand.
 1. Smooth, lustrous
 2. Don not lint
 3. Do not pill readily
 4. Shed soil
 5. Cool, slick
 6. Little loft or bulk
 7. Snagging depends on fabric construction
 8. Stretch depends on amount of twist
4. Absorbency depends on fiber content
5. Size in denier
6. Usually very low or very high twist
7. Least complicated manufacturing process
 - a. Balanced Yarns: Smooth fabrics are made from balanced yarns.
 - b. Unbalanced Yarns: Crepe and textured surface may be created from unbalanced yarns.

Direction of twist:

In addition to the amount of twist in a yarn, the direction of the twist is also designated. There are two types of yarn twist S and Z.

Single Yarn	Ply Yarn	Cord Yarn
A single yarn is made directly from fibers.	A ply yarn is made by second twisting operation which combines two or more singles. Each part of the yarn called a ply. The twist is inserted by a machine called twister. The ply yarn is also known as folded yarn.	Cord yarns are composed of two or more ply yarns combined for is simple cord yarns, the singles used to make the ply yarns and the ply yarns used to make the cord are simple yarns.
		



Notes

Yarn Numbering System: Yarn numbering systems are therefore used to express a relationship between a unit length and weight of yarns. There are two main numbering system in use.

Numbering system

1. Direct-> 1.Denier (900 m l gms=1 Denier) 2.Tex (1tex=1gm/km 840)
2. Indirect-> 1.Matric No.(840 yds=1lbs=1S) 2.English No.(50/1=50 single yarns)

Yarn manufacturing system:

The twisting process by which fibres are formed into a yarn is referred to as spinning. Spinning includes all the processes required to prepare and clean the fibres from the opening of the bale to the twisting of the yarn in its preparation for the textile loom.

1. Opening and Picking:

In order to produce a uniform product, the fibres from numerous bales be blended, or thoroughly mixed together, and from this composite, the final yarns will be produced. The masses of fibres from these numerous bales will be fed into a machine called a blending feeder. As these masses of fiber are loosened and thoroughly mixed, some remaining heavy impurities such as dirt, remnants of seeds, leaves or stems, are removed by a line of machine known respectively as pickers, breakers, intermediates and finishers each in succession being a somewhat more refined cleaner of the raw fibres. From these machines, the fabric emerges as a lap, a loose, formless roll.

2. Carding:

The lap is unrolled and drawn onto a revolving cylinder covered with fine hooks or wide bristles. These wide bristles pull the fibres in one direction, separate those which are individually tangled together and form them into a thin film. This process is known as carding. The thin film is drawn into a funnel shaped opening which melds it into a round rope like strand approximately an inch in diameter; this is called the sliver.

3. Combing:

The comber is a refining device by which the paralleling and straightening of the individual fibres is carried to a more exact degree. The longer fibres are again formed into a sliver, known as the comb sliver.

4. Drawing:

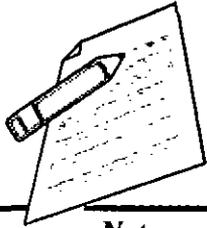
In the drawing operation, further blending is accomplished by working together several slivers and drawing or pulling them out in the drawing frame without twisting but reducing the several slivers to a single one about the same diameter as each of the components.

5. Roving:

The combined or condensed combed sliver is taken to the slubber of a series of machines called roving frames.

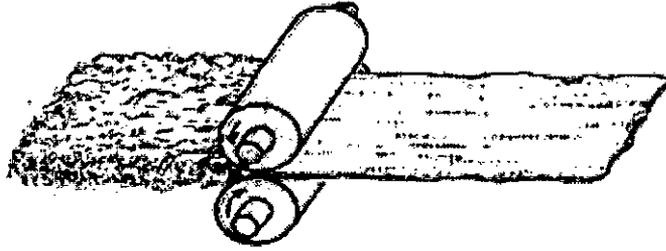
6. Spinning:

Spinning is a continuation of the roving and on the spinning frame many spools containing the roving pass through the ring spinning mechanism which further draws and twists to a yarn of the required size and twist and winds it on bobbins preparatory to the weaving operation.

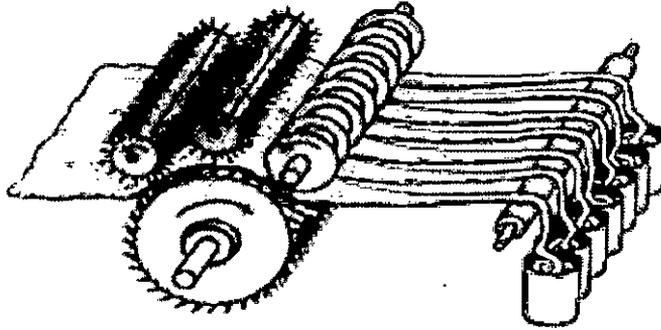


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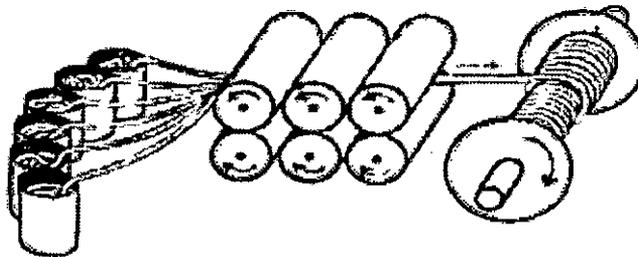
Yarn Manufacturing



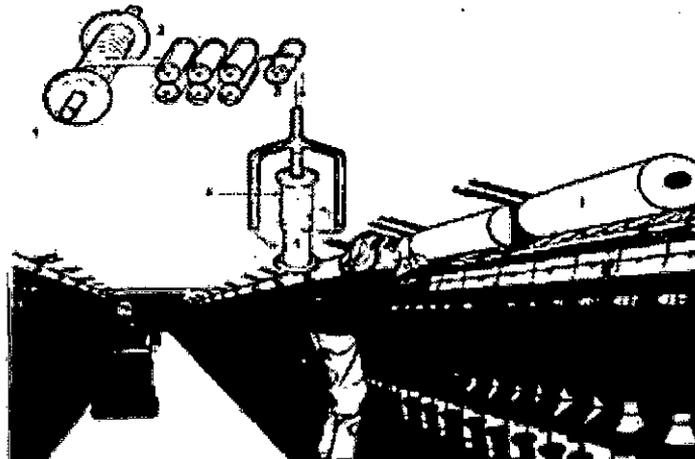
Lap formation



Sliver formation



Roving



Spinning

Spinning Systems for Different Types of Fibers

Group	Fiber Type	Spinning System	Fiber length
Short staple system	Cotton	Cotton system	10-25 mm
	Man-made fibers (cotton type)	(ring spinning)	20-50 mm
	Mainly cotton	Rotor spinning Condenser spinning (similar to woollen system)	10-100 mm
Long staple system	Wool	Woollen system	18-60 mm
	Man-made fibers (wool type)		60-120 mm
Bast fiber systems	Flax	Flax system	Upto 1000 mm
	Hemp	Hemp system	
	Jute	Jute system	
Silk systems	Silk	Spun silk (schappe)	upto 250 mm
		Noli silk (bourette)	upto 60 mm
Man-made fiber systems	Man-made fibers	Converter Direct spinning	Continuous



Notes

TYPES OF YARNS:

1. Textured Yarns:

Textured' is a general term for any continuous filament yarn whose smooth straight fibres have been displaced from their closely packed, parallel position by the introduction of some form of crimp, curl, loop or coil.

Textured yarns can be made from either filament fibres or staple fibres cut from filaments that have been given a textured configuration of some type. The majority of textured yarns are made from filament fibres. Texturizing occurs following the spinning of the fiber material through the spinneret. It may be done immediately following fiber formation and be a part of a continuous operation or it may be done some time after the filaments have been made. There are three types of textured yarns. 1. Bulk textured yarns 2. Stretch textured yarns 3. 'Set-modified stretch textured yarns.

2. Novelty Yarns:

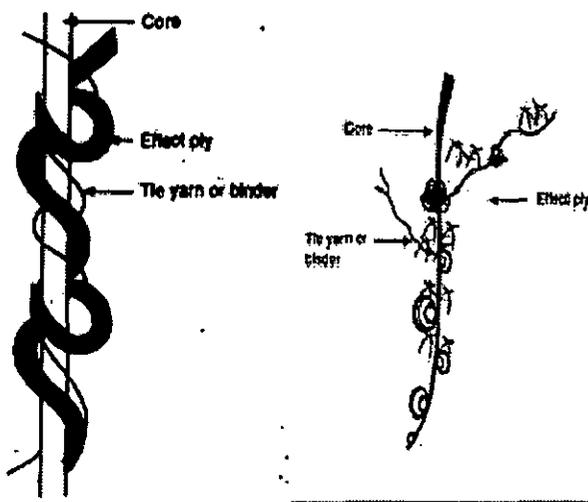
Novelty yarns are made primarily for their appearance. They differ from simple yarns that their structure is characterized by irregularities. ASTM defines a fancy yarn as a yarn that differs significantly from the normal appearance of single or plied yarns due to the presence of irregularities deliberately produced during its formation.

In single yarn the irregularities may be due to the inclusion of knots, loops, curls, slubs and the like. In plied yarns the irregularities may be due to a variable delivery of one or more of its components or to twisting together dissimilar single yarns.

The term fancy, complex and novelty are considered synonymous. As noted from the definition most fancy yarns are either single or plied. There can be endless variety of novelty yarns. A typical novelty yarn has three basic parts: 1. The ground or foundation or core. 2. The fancy or effect 3. The binder.



Notes



Facts about novelty yarns:

Novelty yarns are usually ply yarns, but they are not used to add strength to the fabric. If novelty yarns are used in one direction only, they are usually in the filling direction. They 'go further' and are subject to less strain and are easy to vary for design purpose. Novelty yarns add interest to plain weave fabrics at lower cost. Novelty yarn effects are permanent.

Novelty yarns that are loose and bulky give crease resistance to a fabric but they make the fabric spongy and hard to sew.

The durability of novelty yarn fabrics is dependent on the size of the novelty effect, how well the novelty effect is held in the yarn and on the firmness of the weave on the fabric. Generally speaking, the smaller the novelty effect, the more durable the fabric is, since the yarns are less affected by abrasion and do not tend to catch and pull out so readily.

Different types of Novelty Yarns:

1. Slub yarns
2. Flock yarns
3. Spiral yarns
4. Ratine yarn
5. Boucle yarn
6. Nub/spot/ knot or knob yarns
7. Seed or splash yarn
8. Chenille yarn
9. Metallic yarns

PROPERTIES OF SEWING THREADS:

The performance of textile fabrics and clothing is strongly influenced by the properties of the yarns from which they are made. Sewing threads require certain yarn properties.
Regularity: Smooth fabrics should be sewn only with very regular yarns. In spun yarns, this is achieved by repeated doubling and drafting, and by combing out the short fibres.
Strength: Yarn strength depends on the quality of the fibres, the yarn regularity and the twist. Folding increases the strength.

Hardness/Twist: The twist density affects the hardness of a yarn and hence the handle and the appearance of textiles.

Extensibility/: Extensibility and elasticity are very important during

Elasticity: yarn processing and utilisation. They are determined mainly by the fibre type and the spinning system.



Notes

22 FABRIC CONSTRUCTION

Introduction

Fabric can be made by different methods. Fabric is the combination of yarns to make a full sheet. Fabric can be made by weaving, knitting and non-woven techniques. Weaving and knitting methods require long yarns but non-woven method can use small fibres also. Weaving is the name given to the inter-lacing of two sets of yarns, warp and weft at right angles and the fabric thus formed is called as woven fabric. The warp yarns are those yarns which lie in the length-wise direction of a fabric and the cross-wise yarns are called weft. The direction of the yarns is considered important in garment designing. The lengthwise edge of fabric is called selvedge. Grain indicates the direction of the warp or weft yarn. If the yarns are not at right angle, it is called off grain.

Difference between warp and weft

S.No.	Warp	Weft
1.	Warp yarns are stronger	Weaker yarns can also be used
2.	If twist is more than the length of yarns per inch is also more	Twist and length of yarns per inch is less
3.	Ply is preferred for warps	Singles can be used
4.	Stretchability is low	Stretchability is high
5.	Plain yarns are more preferred	Novelty yarns and textured yarns can be used
6.	Filamentous yarns are preferred as warps.	Spun yarns are used.
7.	These are parallel to the selvedge.	Weft is perpendicular to selvedge.
8.	Yarns are finer in warp-wise direction as they have higher twist.	Yarns may be thicker or finer with medium twist.
9.	Most garments are cut in lengthwise direction.	Some garment parts such as collars are cut in this grain for decoration.

- Warp : Warp yarns are stronger
Weft : Weaker yarns can also be used
- Warp : If twist is more than the length of yarns per inch is also more
Weft : Twist and length of yarns per inch is less
- Warp : Ply is preferred for warps
Weft : Singles can be used
- Warp : Stretchability is low
Weft : Stretchability is high



Notes

5. Warp : Plain yarns are more preferred
Weft : Novelty yarns and textured yarns can be used
6. Warp : Filamentous yarns are preferred as warps.
Weft : Spun yarns are used.
7. Warp : These are parallel to the selvedge.
Weft : Weft is perpendicular to selvedge.
8. Warp : Yarns are finer in warp-wise direction as they have higher twist.
Weft : Yarns may be thicker or finer with medium twist.
9. Warp : Most garments are cut in lengthwise direction.
Weft : Some garment parts such as collars are cut in this grain for decoration.

Weaving

Weaving is the simple technique of making a fabric. The lengthwise and crosswise yarns are overlapped (interlaced) one above the other in an alternative manner. This process of interlacing is done on loom. Loom is a wooden / metal machine, which holds the warp yarns and facilitates the weft yarn to pass up and below the warp to form the woven structure.

The technique of fabric construction by weaving was probably known as spinning during the ancient times. In the course of time, looms were made which were simple and hand operated. The fabric woven in these looms is called hand loom fabric. Today power loom has taken place of the hand operated loom which can weave fabric faster and with less defects in comparison to hand looms (Figure 5.1).

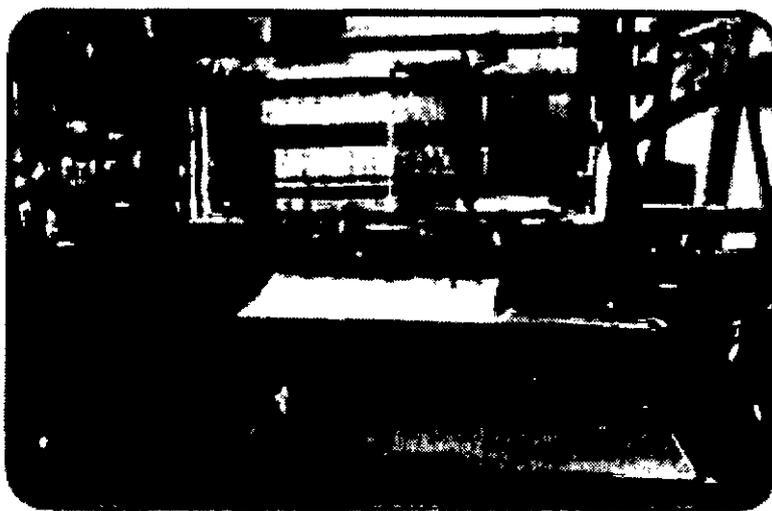


Figure 5.1 Shuttle Loom

Looms can be classified into various categories. This classification is based upon the picking operations used by the loom. The looms which use shuttles for weft insertion are called conventional shuttle or fly shuttle looms. The fabric woven in this loom has more defects as it used large wooden shuttle which causes abrasion resulting in more broken yarns. These looms are also very noisy and PPM (Picks Per Minute) is also low.

The looms which use other devices to bring the filling yarn through the fabric are called shutterless looms. These looms have high productivity with fewer fabric faults (Figure 5.2).



Notes

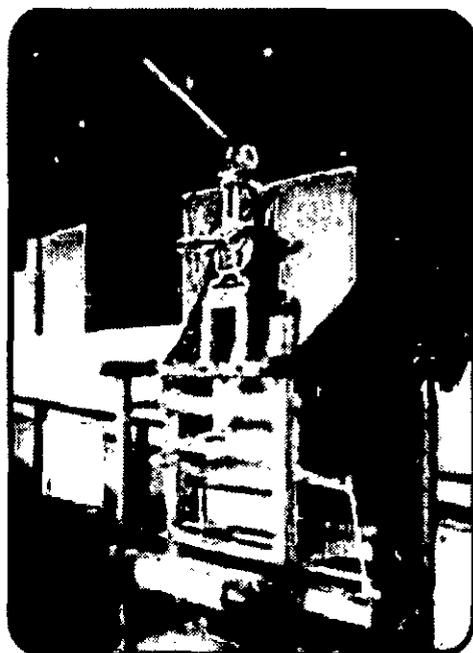


Figure 5.2 Jacquard Loom

The major parts of a loom are described below:

Major Parts of a Loom:

- **Warp Beam:** This is round roller/cylinder on to which the warp/ lengthwise yarns are arranged one after another in a parallel manner (Figure 5.3).

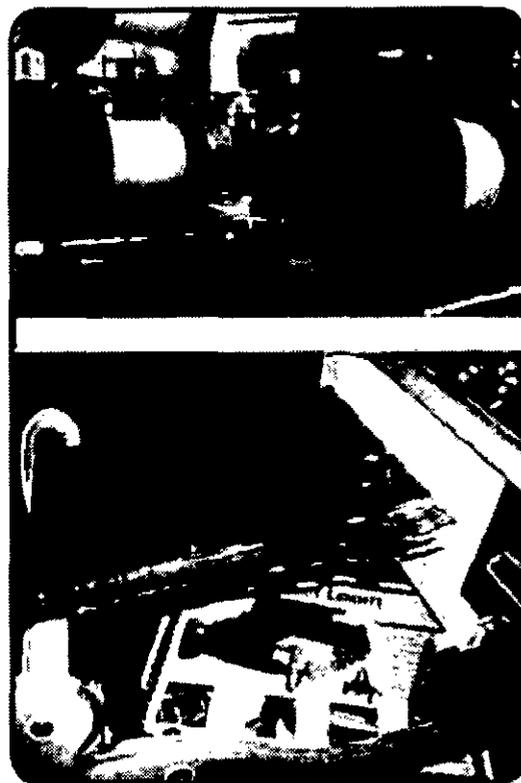


Figure 5.3 Warp Beam



Notes

- **Whip Roll:** A small guide roller over which the warp yarns pass, as they move to the lease rod.
- **Lease Rod:** Two guide rod between the whip roll and the heddles, to separate the alternative warp yarns.
- **Heddles:** Small wire made out of steel. They are a set of vertical wires laid into the harness frame. This helps in the movement of the warp yarns (Figure 5.4).



Figure 5.4 Heddle

- **Harness:** A wooden frame to separate warp yarn such that a shed (V shaped gap) is formed, through which weft thread is passed.
- **Bobbin:** Small long plastic or metal holder on to which the (filling) weft yarns are wound.
- **Shuttle:** A wooden / plastic boat shaped device which hold the bob-bin with the weft yarns. This moves from right to left pulling the weft yarn in its place (Figure 5.5).

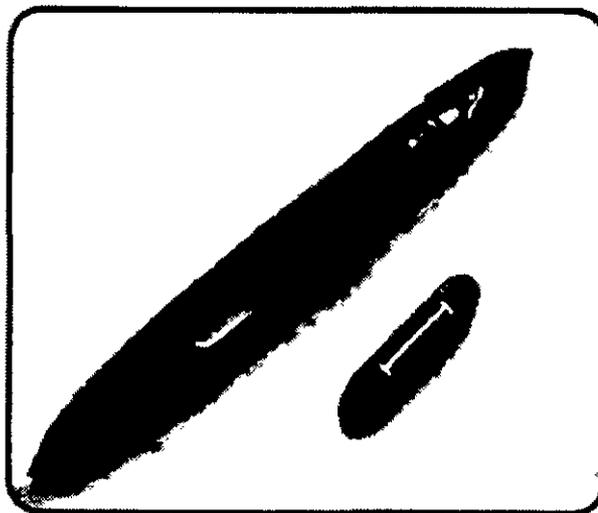


Figure 5.5 Shuttle



- **Reed:** A vertical wooden frame with very close steel wires. Each warp yarns pass through each wire. The gap between the wires is known as dents (Figure 5.6).

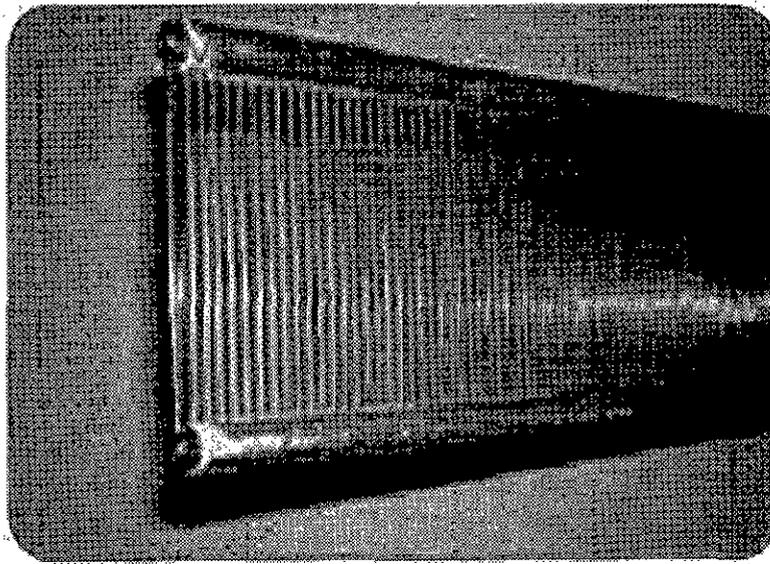


Figure 5.6 Reed

- **Breast Beam:** This is a bar, which guides the newly woven cloth towards the cloth beam.
- **Cloth Beam:** A wood or steel roller on to which the woven cloth is wound after weaving (Figure 5.7).

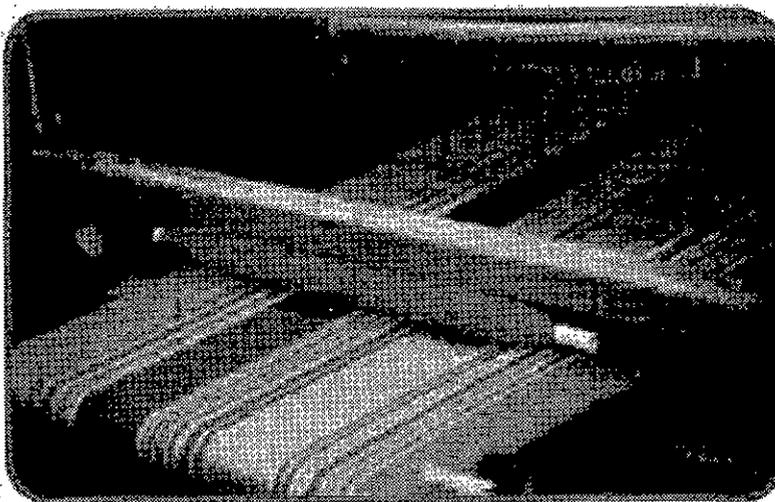


Figure 5.7 Cloth Beam

Basic Weaving Operation

The yarns intended for warp must pass through some basic operations like— spooling, and warping to prepare them to withstand the strain during weaving.

Spooling

Winding of warp yarns on large spools, or cones which are placed on a rack called creel is known as spooling. These yarns are then wound on the warp beam (Figure 5.8).



Notes



Figure 5.8 Spooling

Sizing

The warp yarns are unwound and dipped in a sizing bath which consists of starch. The slasher machine covers every yarn with a coating which adds strength to the warp yarns to withstand the stress, during weaving (Figure 5.9).

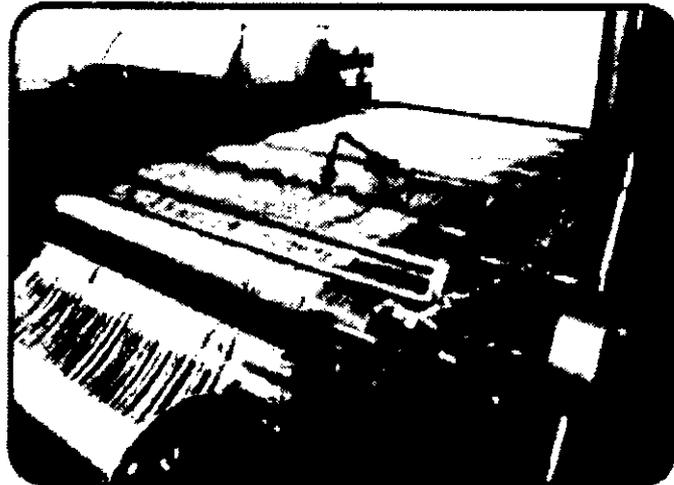


Figure 5.9 Sizing

Warping

Warping is the process of winding the sized warp yarns on the warp beam which will be placed over the loom. The warp beam is located at the back of the loom and holds the lengthwise yarns. It controls and releases the warp yarns as the weaving process is carried on. The warp ends are threaded through the heddles held by the harness. Every basic loom has a minimum of 2 heddles. The number of heddles in a loom varies from 2 to 12 for basic weaves, but for fancy weaves the number increases up to 32. The heddles help in the movement of warp yarn to form the shed, through which the shuttle carries the filling yarns. Once the filling yarn is passed through then reed is pushed to put the filling yarn in its place (Figure 5.10).



Notes



Figure 5.10 Warping

Fabric Making

The interlacing of warp and weft yarns results in woven fabric making. This is done on a loom through four main processes. They are shedding, picking, beating up and taking up and letting off processes.

- Shedding can be described as raising the specific warp yarns by the hard movement of the heddles; to form a V shaped gap known as shed for the weft yarns to interlace through.
- Picking is the processing of interlacing/passing the filling yarn (weft) through the shed formed from right to left (Figure 5.11).



Figure 5.11 Picking

- Beating up is also known as battening. This is the process of pushing the filling yarn (weft) firmly into its place by the movement of the reed. Beating arranges the filling yarns parallel to each other very closely to create a woven structure.
- Taking up and letting off is the process of winding up woven cloth into the cloth beam and releasing more warp yarns from the warp beam for weaving.



Notes

Terms Used in Woven Fabrics

The common terms used while weaving is given below:

Selvages

Selvages are the lengthwise edges which run on both sides of the fabric. They are usually 0.5 to 1.5 cm broad. Selvages prevent the fabric from raveling. It is strong with a greater number of warp yarns. There are different types of selvages namely plain selvedge, tape selvedge, split selvedge, fringe selvedge, fused selvedge and adhesive finished selvedge (Figure 5.12).

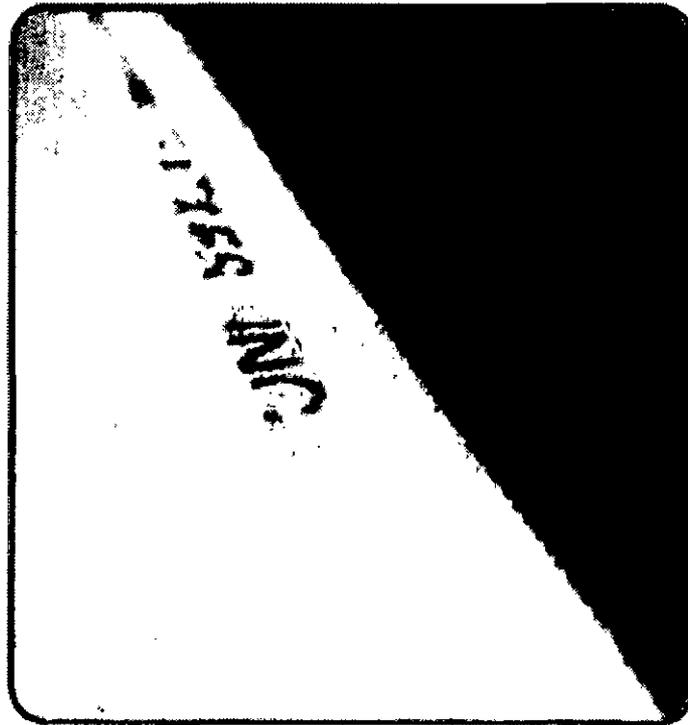


Figure 5.12 Selvages

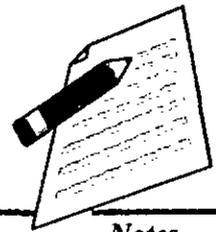
Thread Count

The number of warp (ends) and weft (picks) per square inch of fabric is called thread count or fabric count. The higher the fabric count the more strong and more durable is the fabric. Fabric with higher thread count is more expensive and is denoted by X x Y. Example 30 x 50 thread count means 30 and 50 yarns in warp and weft direction for one inch. When the number of warp and weft yarns are almost equal the construction of fabric is called balanced and when the difference in warp or weft yarns is more than the other, it is called an unbalanced construction.

Factors Affecting the Durability of the Fabric

The durability of a fabric depends on various factors. The most common are listed below:

- The kind and quality of the fibre.
- The tensile strength of the yarn.



- The amount of twist in the yarn.
- The use of ply yarns as compared with singles.
- The use of uniform yarn rather than novelty yarns and
- The compactness of a fabric.

Weave structures

The interlacing of warp and weft yarns to make woven structure is divided into different groups based upon the interlacing as basic weaves and fancy or surface figured weaves. Basic weaves are a group of weaves which are formed with interlacing of the yarns at right angles only to form a square pattern (Figure 5.13). Fancy weaves are weaves which form decorative patterns by the use of extra warp or weft yarns. Basic and fancy weaves are further classified base upon the type of interlacement and yarns used.

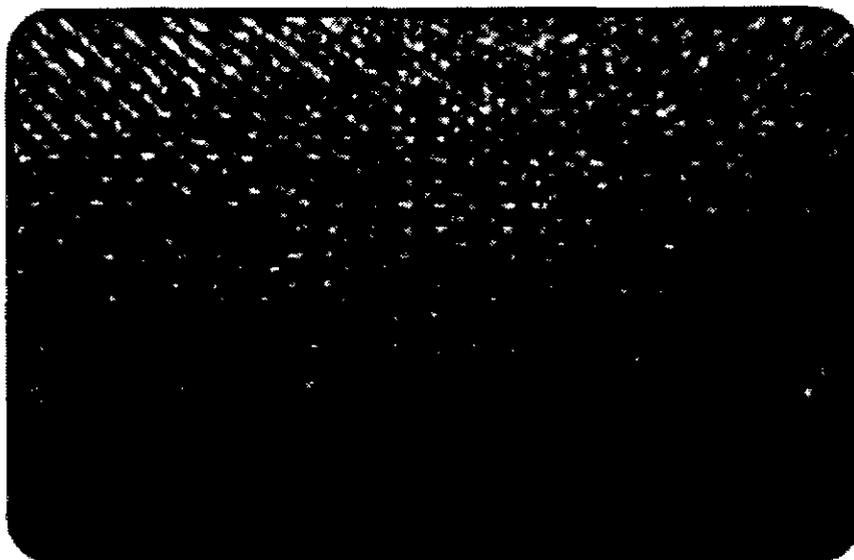
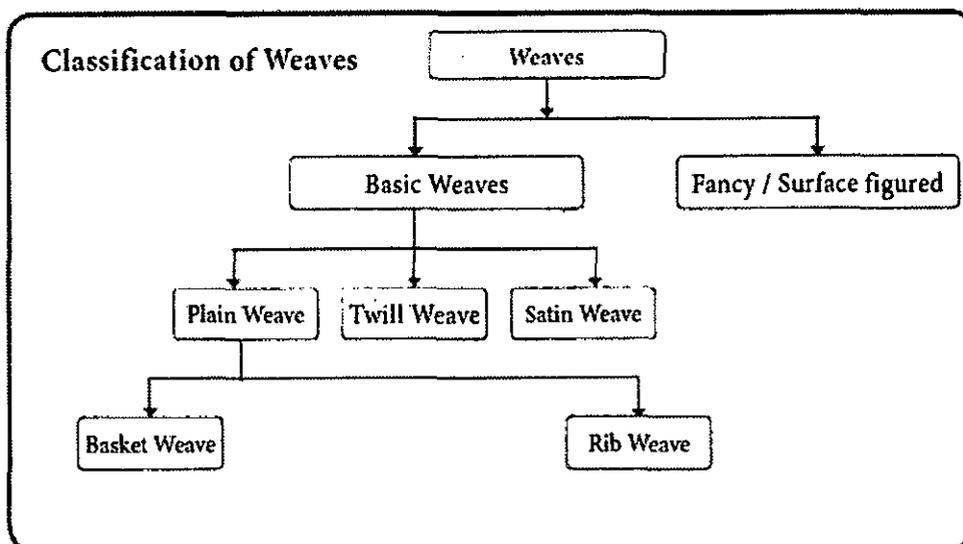
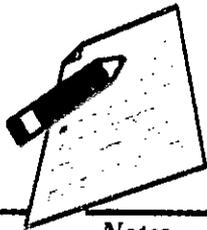


Figure 5.13 Weave Structure





Notes

WEAVES AND THEIR PROPERTIES			
Type	Structure	Properties	Example
Plain Weave	<ul style="list-style-type: none"> Warp and weft interlaced alternatively 	<ul style="list-style-type: none"> Flat, look identical on both sides. Yarn count even Balanced fabrics Inexpensive 	<ul style="list-style-type: none"> Cheese cloth. Voile
Basket Weave	<ul style="list-style-type: none"> Two or more warp interlaced with one or more weft Variation of plain 	<ul style="list-style-type: none"> Flat Variation of plain Create checker board effect Identical on both sides. Use of coloured yarns for variation 	<ul style="list-style-type: none"> 2 x 2 blouse material.
Rib Weave	<ul style="list-style-type: none"> Use of cords or different type of thicker yarn in warp or weft Cord in warp is known as warp rib Cord in weft is known as weft rib 	<ul style="list-style-type: none"> Heavy Drapes well Creates texture and design 	<ul style="list-style-type: none"> Poplin Taffeta

Type	Structure	Properties	Example
Dobby	<ul style="list-style-type: none"> Small geometrical designs, created by special loom attachment known as Dobby attachment. 	<ul style="list-style-type: none"> Decorative design Corded effect Good appearance Simple and attractive 	<ul style="list-style-type: none"> Huckaback Pique
Jacquard	<ul style="list-style-type: none"> Interlacing of warp at various weft yarn at different points to create designs using control mechanism 	<ul style="list-style-type: none"> Intricate designs Multi coloured effect Drape well Durability 	<ul style="list-style-type: none"> Brocade Tapestry.

Details of different type of woven fabrics (Figure 5.14) are presented below

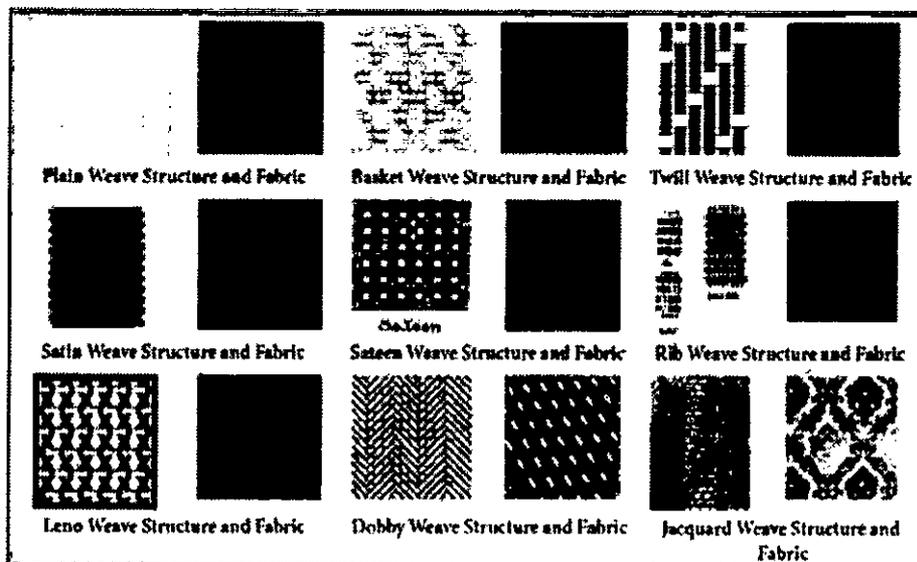


Figure 5.14 Types of woven fabrics



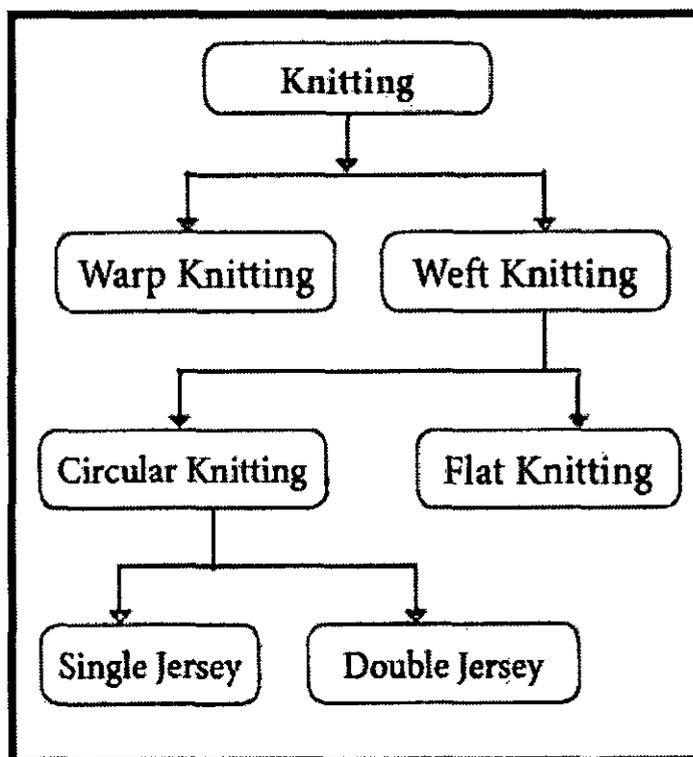
Notes

Knitting

The second most important fabric construction method after weaving is knitting. Knitting is the process of making loops and throwing the yarns through loops to form a fabric. In the earlier days knitting was considered as a unique technique of making fabric using wool fibres. The oldest knitted products are socks found in Egypt tombs. Knitting is done using long stick like needles. The first knitting machine was invented in 1589, by Reverend William Lee. It slowly developed and today the market is filled with complex knitting machine to produce a huge range of knitted fabric.

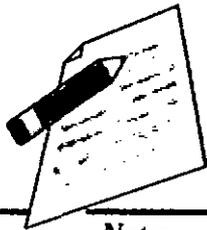
Classification of Knitting

Knitting is divided into two main groups as warp and weft knitting. Warp knitted fabrics are produced by a series of yarn forming loops in the lengthwise direction of the fabric. Weft knitted fabrics is produced when one continuous yarn forms the loops in the crosswise directions. The most common types of warp knit fabrics are Tricot knit, Raschel, Milanese and Simples knit. The different kinds of weft knits are plain, purl and rib. Both weft and warp knitting can be incorporated in the jacquard mechanism to produce fancy knitted fabrics.



Knitted Fabric Making

Knitted fabric is constructed by forming the yarns into loops. The vertical rows of loops stitches in knit fabric are known as wales and the horizontal rows of loops are called courses. The loops are formed by a group of needles or shafts, which are arranged one after the other in the knitting machine on the needle plate. The needles are evenly placed. Sinker is used to pull the needles down, which pulls the yarn into the previous loop. The knitted fabric is pulled down and rolled at the base of the machine and collected for further use.



Notes

Uses of Knitting

Knitted fabrics are used for (Figure 5.15)

- Clothing (Underwear, Sweaters)
- Home furnishing (Curtains, Towels)
- Medical textiles (Grip Bandages)
- Industrial textiles (Wipes, Absorbent Pads)

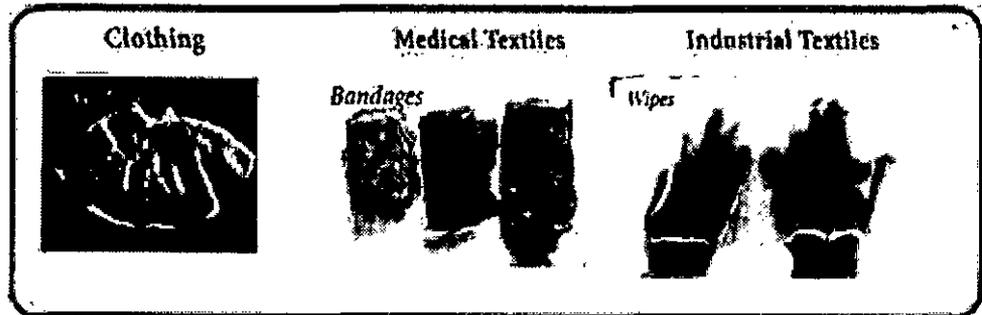
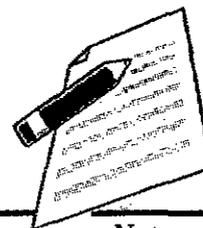


Figure 5.15 Uses of Knitting



Notes

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TEXTILE FINISHES

What is Textile Finishing?

When you buy textile goods in a store, you choose things for different reasons: because they are brightly coloured, soft and perhaps warm, or have some other special qualities. But do you know how the textiles end up looking and feeling the way they do? It is done through a process called textile finishing.

Textile finishing is the term for chemical and mechanical processes used on textiles after they have been made. One important note: textile finishing does not include processes like dyeing that add colour to textiles, but it can make fabrics more welcoming to dyes.

Right after new textiles have been made, they are called gray goods because they're still in their natural colour, and sometimes they are rough and unappealing. The industrial processes involved in making textiles can leave them dirty and not yet ready for use in making products like clothing. Textile finishing produces results that make textiles more appealing and usable to the consumer. Finishing steps may take place before and after fabric has been dyed.

Over time, many such processes have been invented. One simple finishing process, steaming, removes wrinkles. Some finishing processes make textiles softer to the touch. Others make them crisper and more durable. There are finishing processes that control shrinkage, and others that add special qualities such as stain-resistance, waterproofing, or repellence to insects.

Methods of Textile Finishing

But how is textile finishing done? Let's look at a few common textile finishing methods.

Chemical Finishing Methods

Chemical finishing methods include bleaching and mercerizing. Bleaching is a process of whitening textiles through a chemical process that involves oxidation. Textiles may be bleached to remove unappealing natural colour or variations in surface colour, or as a step-in preparation for dyeing. Mercerizing adds strength and lustre to cotton textiles by submitting them to an alkali solution. This process also allows them to better soak up dyes.

Mechanical Finishing Methods

Mechanical textile finishing methods include napping and shearing, processes that create a soft surface much like velvet. They also make textiles warmer for the wearer. (Think of your favourite fleece jacket or blanket.) During this kind of treatment, the textile is subjected to rollers covered with many very short wires that raise the fibres from the surface.



Notes

Different Stages of Dyeing Textiles

Textiles may be dyed at any stage of their development from fibre into fabric or certain garments by the following methods;

- **Stock Dyeing:** Stock dyeing refers to dyeing staple fibres before they are spun. Here the packed fibres are removed from the bales and then packed in large vats to be circulated with dye liquor at elevated temperature.

In stock dyeing, which is the most effective and expensive method of dyeing, the colour is well penetrated into the fibres and does not crack readily. Stock dyed fibres does not spin as readily as undyed fibre because it loses some of its flexibility, but lubricants added in the final stage overcome most of this difficulty.

- **Top dyeing:** Top dyeing is adopted in the worsted industry. Top is wool that has been combed to take out the short fabrics, in a rope like form about 1 inch (30mm thick). The top is then wound on perforated spools and the dye liquor is circulated through it. Perfect even dyeing is possible in this method.

Yarn Dyeing: Dyeing done at yarn stage is known as yarn dyeing. Yarn dyed fabrics are usually deeper and richer in colour. The primary reason for dyeing in the yarn form is to create interesting checks, stripes and plaids with different coloured yarns in the weaving process. Chambrays, for example, are usually woven with a coloured warp and white filling. Other examples are checked gingham, shepherds check, plaid and seer sucker.

Piece Dyeing: Bulk of fabrics are dyed in this method. Piece dyeing is thoroughly satisfactory as regards evenness, penetration and overall fastness.

Fabrics may be piece dyed whether it is composed of only one kind of fibre or yarn or blends of different fibres or combinations of different yarns. When the fabric is made of one kind of fibre or yarn, the dyeing is not complicated because the one appropriate dye is used. If the fabric is of a blend or combination of different yarns, then special procedures are required where different dyes that are particular for each fibre need to be selected. They are union dyeing and cross dyeing.

Union Dyeing: Different fibres may require different dyes to obtain the colour; this may be done by putting the appropriate colour dye that is specific to each type of fibre into one bath.

Cross Dyeing: Cross dyeing of goods may be accomplished in any one of the several ways. One method is a combination of stock dyeing or of yarn dyeing with subsequent fabric dyeing.

Solution pigmentation or Dope dyeing : A process called solution pigmentation or dope dyeing has been used for manmade fabrics ranging from rayon through saran and glass fibres. In dope dyeing, dye is added to the spinning solution before it is extruded through the spinnerets into filaments. This method also gives a greater degree of colourfastness. Effective results have been obtained by this method.

Garment Dyeing: Certain kinds of non-tailored apparel, such as hosiery; pantyhose and sweaters can be dyed as completed garments. A number of garments are loosely packed into a large nylon net bag. The bags are then put into a puddle dyer, which is a tub with a motor-driven puddle that agitates the dye bath. Garment dyeing is an economical method.

Resist Dyeing: Resist dyeing can be done either in garments or fabrics. Resist dyeing is a term for a number of traditional methods of dyeing textiles with patterns. Methods are used to 'resist' or prevent the dye from reaching all the cloth, thereby creating a pattern and



Notes

ground. The most common forms use wax, some type of paste, or a mechanical resist that manipulates the cloth such as tying or stitching. Another form of resist involves using a chemical agent in a specific type of dye that will repel another type of dye printed over the top. The most well-known varieties today include tie-dye and batik.

Tie and Dye: Tie-dye is a process of resist dyeing textiles or clothing which is made from knit or woven fabric, usually cotton, typically using bright colours. Tie and dye developed especially in the regions of Gujarat and Rajasthan. People of Jaipur are particularly skilled in this craft. Tie-dyeing is accomplished by folding the material into a pattern, and binding it with string or rubber bands. Many different kinds of dyes can be used, mostly reactive dyes are used.

Tie dye is a technique for dyeing fabrics that results in interesting, colourful patterns. The technique involves crumpling, pleating or folding the fabric into various patterns, then tying it with string, hence the name 'tie and dye'. The tied fabric is dipped into vats of dye, then wrung out and rinsed. The ties prevent the entire material from being dyed. Designs are formed by applying different colours of dyes to different sections of the wet fabric. Tied areas accept dye unevenly amidst the folds, creating varied patterns in the finished product.

There are different types of methods of tying threads to obtain different patterns such as: Striped design - diagonal, vertical and horizontal stripes, Knotting, Circular design, Marbling, Rouching, All over tiny dots, Mango design and Flower design.

Batik : This is another form of resist dyeing which produces patterns like prints. The difference between 'tie and dye' and 'batik' lies in the fact that former is by tying the spots and latter applying wax on the cloth. The word 'batik' origin is Javanese, meaning 'to tattoo'. The fabric used for batik should be smooth and thin in order to get a good effect. Silk is perhaps the easiest fabric of all to use. Other fabrics suitable for this are soft cotton and organdie. Any fabric for making batik should be thoroughly washed and ironed before use.

Design is traced lightly to the fabric with sharp pencil. Brushes of various sizes will be needed to apply hot liquid wax on the design. Bees wax is the best wax to use for batik. Then the fabric is dyed. The wax prevents the dye to from penetrating into the design. The finished fabric is left with a white pattern on a coloured background. The wax is sometimes deliberately cracked to form a fine spider-like line of colour where the dye penetrates these cracks.

Printing

Printing produces colourful effect on the fabrics. Printing is application of colour in the form of a design. Printing can be done by hand or machine. The dyes used in printing are in the form of pastes.

Types of printing : Printing has been divided into,

A) Hand printing B) Machine printing

A) Hand printing

- **Block Printing :** Block printing was practiced by Chinese and Indians some two thousand years ago. Blocks are made of wood or wood and lino. The design is carved on line which is generally cut to a thickness of $\frac{1}{8}$ inch. This cut piece of lino is struck to wooden piece of the same size. Many printers use only wooden blocks on which the design has been

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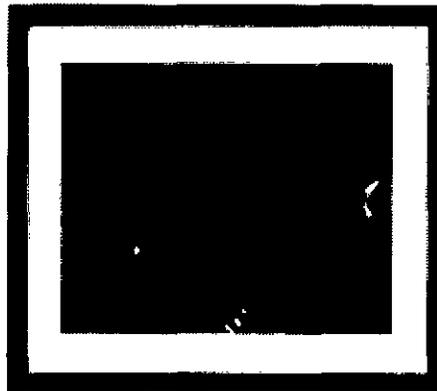


carved. These blocks are dipped in paste of colour and then pressed on the fabric, so that coloured pattern is produced on the fabric. First a block carrying the paste of one colour is stamped on the fabric and allowed to dry. Then another block carrying the paste of different colour is stamped over it to form the multi-coloured patterns. The process is repeated over the entire fabric surface to be printed.

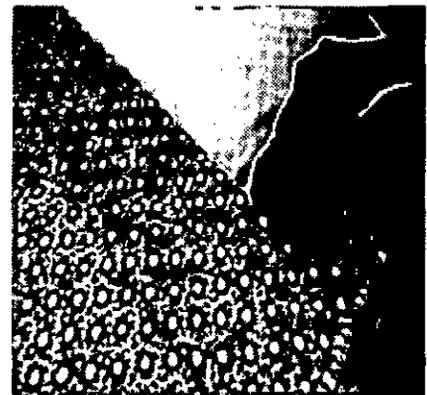
It is a slow and costly process; uniform pressure is needed to transfer the colour. The intensity of colour cannot be uniform throughout.

- **Stencil Printing** :Stencil printing originated in Japan. Its high cost limits its use and importance. In this, printing, the design must be first cut in cardboard, wood or metal. The stencil may have a fine delicate design, or there may be large spaces through which a great amount of colour may be applied. A stencil design is usually limited to the application of one or two colours and generally used for narrow width of fabric like block printing. This method is very slow.
- **Screen Printing** :Originally, this technique was referred to as silk screen printing because the screens were made of fine, strong silk thread. Today they are also made of nylon, polyester, vinyl and metal. Screen printing is done with the use of either flat or cylindrical screens. Each screen design may be drawn by hand and a coating of lacquer or other impermeable substance applied to all parts of the screen that are not part of its design. Today the design is photographed and a negative is used for each sensitized screen to opaque or block out those areas not part of the screen's colour design. Each screen is then fitted into a wooden or metal frame.

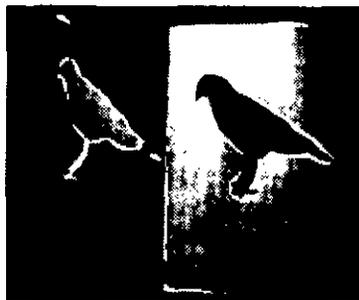
The printing paste or dye is poured on the screen and forced through its unblocked areas onto the fabric with a rubber-edged squeegee. The frame is then raised and placed on the next section of the fabric and the operation is repeated until the entire length of the cloth is printed with that particular colour. This process must be repeated for each colour to be used in the design.



Wooden Blocks



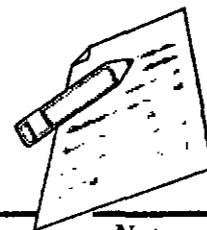
Printed Design



Design cut on Card board



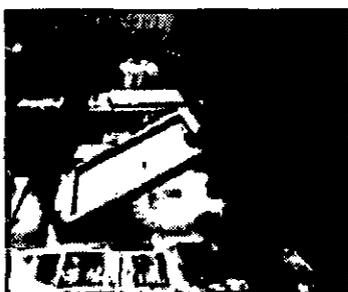
Design on fabric



Notes



Printed design



Screens



Printed Design

The hand screen printing is time-consuming and limited to relatively short lengths of 60 yards (58m) of fabric. Electronically controlled automatic machines can screen print long lengths of cloth at rates of up to 450 yards (400m) per hour.

B) Machine Printing

Machine printing includes Direct Roller printing, Duplex printing, discharge printing, resist printing, pigment printing, transfer printing, photo printing and flock printing.

- Direct Roller Printing :Roller printing was developed in 1785. Thousands of yards of coloured designed fabrics are produced in an hour by this method of printing.

In this printing, several copper cylinders or rollers are engraved with design. Engraving the designs on the rollers is a hard and careful work lasting many days, but actual printing by this method takes very little time.

The roller is as wide as the cloth. The numbers of rollers required depends on the number of colours used in the design. One roller prints one colour only.

The roller printing machine comprises of a large central cylinder around which passes the fabric to be printed, this cylinder rotates with the moving fabric. Number of colours printing rollers, carrying different colours, press against the fabric and the central cylinder. Thus, if there are five colours in the design there are five colour printing rollers. Each of these rollers is made of copper and engraved with the respective design. Furnished rollers which move at intervals, containing the colour or dye are placed close to the design rollers. The dye is absorbed by the brush like surface and transferred to the design engraved rollers.

Next to the design roller is a big iron cylinder or roller around which the cloth is drawn as it is printed. The cloth to be printed needs a rubberized blanket (for padding) and grey

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cloth pass between the engraved rollers and the cylinder. The blanket gives a good surface for sharp printing and the grey cloth protects the blanket besides absorbing the excess dye. Printing machines of this kind can be provided with up to fourteen rollers, as they are able to produce patterns in fourteen colours. The roller printing machine prints only on one side of the fabric.

- **Duplex Printing** :In Duplex printing, the printing is done on both the sides. The fabric may be passed through the roller printing machine in separate operations. This printing forms clear outline on both sides of fabric.
- **Discharge Printing** :This type of printing is suitable for fabrics with dark backgrounds. The fabric is first dyed. A discharge paste which contains chemicals to remove the colour is then printed on the fabric, to produce a white pattern on a ground colour. This print is done on materials like cotton and rayon.

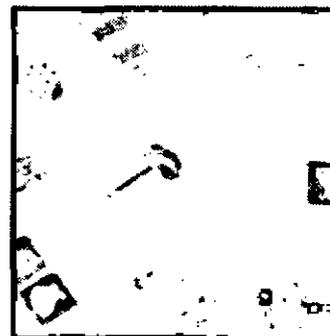
Resist Printing :This is just the opposite of discharge printing. In this type of printing, resist paste is printed first on the white fabric, and the fabric is then piece dyed. The resist materials used are resins, or clay or gum. It is put in a patterned form on fabric and is subsequently immersed in dye. The dye will affect only the parts that are not covered by the resist paste. The places where resist material has been put remain undyed. After fabric has been passed through subsequent dyeing processes, the resist paste is removed, leaving a pattern on dark background.

Pigment Printing :In this, dyes used are insoluble in water and very fast to light. These pigments are made into colour printing paste, using various ingredients especially resin to act as binder and the pigment to the printed fabric.

- **Transfer Printing** :In this process, certain substances can be made to pass from a solid state directly to a vapour state when heated and return directly to a solid when cooled. The design is printed to a paper, which is fed into a machine. This is brought into contact with heat zone, which vaporises the dye on the paper. Thus, the dye is absorbed by the fabric.
- **Photo Printing** :In this type, the fabric is coated with a chemical that is sensitive to light. The negative of the design is put against the fabric surface and the light is made to fall on it. The design on the negative gets printed on the fabric. The fabric is then washed. Black and white designs and coloured designs can be printed on the fabric.
- **Flock Printing** :This is a technique of adhering minute pieces of fibre, called flock, to form design on fabrics. Using a suitable adhesive, a design is roller printed onto the fabric. Then flock of cotton, wool, viscose rayon, nylon or acrylic are applied to the fabric in a manner that causes it to adhere in an upright position and produce a pile like, velvet - textured design.



Printing Machine



Printed Design



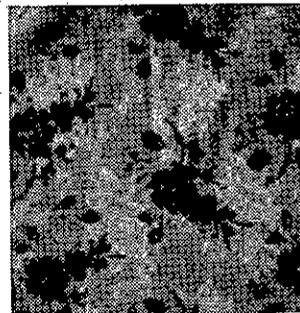
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Photo Printing Machine with Design



Flock Printing Machine



Flock Printed Fabric



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SELECTION OF TEXTILE AND CLOTHING

Introduction

Fabric selection is often a small part of the design project but it can have a big impact on client satisfaction. Our offices receive calls every day from designers who want information about the characteristics of certain fabrics and how they will stand up to everyday use as well as cleaning.

That's why it is so important to make responsible selections. The next time you are specifying fabrics, consider the six criteria listed below. Three criteria —colour, style, and client satisfaction —are the domain of the designer, but perhaps we can provide some information about the other three. Those are suitability, clean ability, and longevity.

Client Satisfaction

This is always an important consideration and sometimes it is hard to balance what a client thinks he or she wants – and what will work in the design scheme. We have found that designers want to make choices that are both pretty AND practical, but are sometimes foiled by those clients who insist on white, weird, or family-unfriendly fabrics.

Colour

Fabric colour and texture are what attract us to textiles and it's the designer's trained eye that is best for making those choices.

Style

Almost an indefinable in the design process, style is so important—making sure that fabrics work together well, that they carry off the look the designer is trying to create, that they send a “message” about the room or the home.

Suitability/Durability

A beautiful fabric can light up a room—but regardless of the look, sometimes it is just not a good choice. A white silk in a sunny room is a good example: white silks tend to yellow over time and silk is very susceptible to sun damage. Needlepoint carpets and rugs are lovely but they are not really suited to stairways and may not be durable when subjected to constant use or the paws and nails of the family pets.

Cleanability

In a room that is used constantly, clean ability is an important consideration. Certain fibres are simply more cleanable than others. Using a fabric with a rayon pile (or any significant



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rayon content) on a family room sofa can be a disaster for the client when he or she realizes that rayon is difficult to maintain. This does not mean that EVERY fabric selection must be steel-like and dull, only that fabrics and carpets specified for high use areas should be able to withstand both spotting and overall cleaning so that they can be enjoyed without worry by the client. One-of-a-kind exotics have their place in every design plan, but they should not be selected for areas of high use.

Longevity

Longevity should always be part of the selection criteria. Choosing quality fabrics that will last and safeguarding them with soil and stain protection are the final steps in making a professional selection. One way to assure clients that longevity has been considered is to talk to them about fabric protection DURING the selection process, rather than thinking of it as an "add-on." Letting the client know about resources that can help them with maintenance, cleaning and after care shows the client that you respect the costs they are incurring and want to help them protect their investment. Without proper care, fabrics can "ugly out" long before they wear out and that can be an unpleasant surprise that leads to client dissatisfaction. While no one can determine how long a certain fabric will last, making selections with these criteria in mind should certainly help you and your client conclude that you have done your best to choose the best!

Clothing selection for the family

Clothing selection for the family presents a greater challenge today than in past generations. Custom and habits are no longer adequate criteria for clothing decisions. The kind and variety of clothes available today seem almost limitless, as a result of the new technology and its accompanying mass production of garments. The inventions of the man-made fibres have been one of the most important stimulants in the recent revolution in clothing and textiles. These fibres have increased greatly the variety and types of clothing available to families. The rising income over the last quarter century has made it possible for families of all income levels in the country to exercise choice in the area of clothing. All these factors have influenced the range and emphasized the importance of decision to be made by families in providing clothing for their members.

Clothing for marriage and the first year

The following suggestion will help the prospective bride or bridegroom to select clothing that meets all the qualifications,

Choose the garments and accessories that reflect the personality. Bold designs, strong colour contrasts, rich fabrics are suitable for individuals with forceful personalities, whereas small details, delicate fabrics, and dainty colours are best for those with gentle personalities.

Select clothing that is flattering to the figure. Figure irregularities must also be considered.

The colours selected should enhance the colour of the skin.

Coordinate colours to make each individual outfit pleasing as well as to integrate the whole wardrobe.

Should choose only those designs and fabrics that represent moderation in current fashion.

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Keep in mind the different occasions for which an article of clothing will be needed.

The clothes planned for the wedding should constitute the basic wardrobe for bride and bridegroom for the following year or more.

The new clothes purchased must be selected to supplement the articles in the present wardrobes of the bride and groom so that a complete, well-balanced wardrobe will be on hand after the marriage ceremony.

The average young couple begins their married life in an apartment where storage space is at a premium, so that the wardrobe must be planned with this in view.

Any clothing that requires a great deal of time and money for maintenance will be unsuitable if the bride expects to work after the marriage, if laundry facilities are limited, or if there will be limited funds for clothing maintenance.

Any wedding clothing that will not be worn after the wedding must be stored and cared for or disposed of.

Clothing for Honeymoon

The place, season, mode of travel and duration of the honeymoon will determine the type and amount of clothing needed.

A week end in some large city, a few days in the mountains, a week at the seashore, or a leisurely motor trip of sight seeing is much more common these days than a long cruise, an extended tour, or a trip abroad.

In planning the honeymoon, a couple should seriously question going to a place that requires special clothing for which they will have no use latter on.

Clothing for a honeymoon in the mountains or at the seashore is usually casual.

Semiformal clothes may be needed for afternoon or evening functions

Clothing for Expectant Mother

Keeping attractive with smart maternity clothes, careful grooming, and well-chosen make-up helps the expectant mother maintain her morale at a high level.

The most obvious is the change in silhouette, primarily the breast and abdominal areas.

Ready-made maternity garments are usually sized so that the pregnant women can continue to wear her customary size.

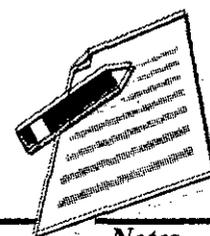
Garments made from knit fabrics containing easy-stretch yarns of cotton or nylon are very satisfactory.

Clothing for the Infant (up to 9 months)

The three 'musts' in clothing the new born baby are warmth, comfort, and hygienic qualities. The amount and type of clothing which the infant will need will be determined to some extent by the time of the year, general climatic conditions, warmth of child's room and condition of the infant. The most suitable fibre for infant's clothing is cotton, because it is soft, and can be kept hygienically safe by washing in hot or boiling water.

Key points for selection of infant's clothing

Infant's clothes should be selected primarily on the basis of comfort and ease of care. Garments which need no ironing, easy to put on the baby, and have no hard or rough surface to cause



discomfort are considered most suitable.

Baby clothes should be soft, pliable and not irritating.

They should provide ventilation to allow any moisture to evaporate. Inadequate ventilation causes moisture to stay next to baby's sensitive skin and may result in skin irritations.

Clothing should be simple and well made. Fancy trimmings require extra care in laundering and often irritate the baby.

Knit fabric garments stretch with body movements and are easy to put on the infant.

Openings all the way down the front or back make dressing simpler.

Ties or flat fasteners are more comfortable; drawstring necklines are not recommended because the infant might become caught in the strings.

If ties or buttons are used, they should be inspected often to make sure that they are sewed securely.

The rate of physical growth is very rapid. Extra seam allowances and hems can be given.

Clothing for Creeper (9 months to 1 year)

After the baby has begun to creep about, more clothes are required, partly for safety's sake. Overalls are the simplest form of garment for both sexes especially those with snaps in the crotch help easy change of diaper. Overalls shield tender knees from floor.

Reinforcement in the knees of pant legs will provide for greater durability.

Snapper or grippers on the crotch of overall save time when diaper changes are necessary.

Garments of firmly woven or knitted fabrics with appropriate seam finishes will give good service for rough wear and many launderings.

In cold weather zones a snowsuit, mittens, and hood will be necessary. A lightweight wind resistant, and washable fabric such as nylon or polyester is desirable.

During the creeping ages soft-soled shoes may be worn if protection from cold is needed. Shoes are about $\frac{1}{4}$ inch longer than the toe, and stocking should be $\frac{1}{4}$ inch longer than the foot.

Training pants are often worn when toilet training begins. (Fig). Training pants will continue to be worn until toilet training is accomplished. These pants are made of two-way stretch fabrics; which fit snugly at the hip. Centre panel of two, three, and four layers provide for absorption and protection. Training pants of knit fabrics are desirable, since they will give ease as the child moves about, and the stretch inherent in the fabric will allow for some degree of growth.

Creepers are physically more active than new born baby. Their clothes should be able to absorb sweat due to the child's activities. Strong and durable fabrics are suitable for this age group. They crawl on the floor, fabrics from knees wear off due to friction. But strong and durable fabrics can withstand the friction. Reinforcement can be given at knees with the help of a patch.

Garments with adjustable straps are more suitable due to growing stage.

Clothing for the Toddler (1-2 years)

The toddler needs clothing that provides maximum freedom for all the activities usual at this stage. Again, overalls are preferred, especially if they have wide shoulder straps that are long enough for adjustments as the child grows.

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Toddlers commonly wear one-piece garments with zipper openings at the legs or crotch.

One-piece pyjamas are usually safer and neater than two-piece ones. Pyjamas should be made of soft, washable material.

Clothing for the Preschool child (2-4 years)

Clothing for the preschool-age child may become a major problem for the family because it is expensive, yet is used for only a short time. It should be selected to help the child develop self-reliance, practice social skills and interact with peers. Garments should be flexible, comfortably warm, easily cleaned, soft, durably encourage self-reliance, convenient for frequent toileting, adjustable to the rapidly growing body, and attractive in design and fabric. Children of this age also need make-believe clothing to accommodate their dream world fantasies.

Allowance for growth

Growth is most rapid during the preschool years.

Buying clothes with growth features will enable a garment to be worn over a longer period of time.

To provide for growth in height

Skirts and dresses with deep hems or tucks at the bottom need to be provided.

Dresses and trousers with tucks at the waistline to lengthen the upper part of dress or to lengthen the crotch.

Overalls with adjustable long straps and deep hems are included.

Yokes with crosswise tucks that can be released as trunk or body lengthens.

Dresses with indefinite waistline or no waistline and deep hems to be added.

Stretch fabrics and,

Two-piece garments are suitable cloth for pre-school.

To provide for growth in girth or width

Use raglan or kimono sleeves rather than set in sleeves.

Introduce tucks, pleats or gathers at the shoulder line.

Use of large underarm or leg seams to let out as needed.

Garments should be reinforced at places of greatest wear, especially the knees of pants and overalls, crotch and underarm seams.

Self-help features

A self-help garment is one, which the child can put on and take off with little or no help from an adult. This feature is as important to child as to his mother. The experience of learning to dress himself makes the child more independent and self-confident. Here are some points to remember in selecting garments that will encourage independence in dressing. (Fig)

Simple styles are easier to manipulate than complicated ones.

Long openings are located for easy reach. Front openings are easier to handle than back or side openings.

Large buttons or fasteners are easier to manage than small ones.

Ample armholes, sleeves and necks make garments easier to get into.



The back of a garment should be easily distinguishable from the front. In pants, it is wise to sew a coloured thread either at the front or back of the waist to help the child distinguish one from the other.

The side of the shoes that goes to the outside should be marked, to help the small child to identify the right from left.

Collarless dresses, blouses, and shirts are easier to handle than those with collars.

Avoid separate belts, as these get twisted and caught in the dressing.

Boy: Clothing for School Going Children (5 to 11 years)

Clothing needs for elementary school children vary in some respects from those of the preschools, although many requirements remain the same. This period is a very active one physically; sports rate high in interest for both boys and girls. Clothing plays an important role in social development, as definite ideas about clothing likes and dislikes are developing. *This is an age of belonging to a group and what the group wears is very important.*

Children want to gain acceptance from their peers, to confirm to the gang or group is their way of belonging. They become self-conscious if they dress up in a different manner. Feeling of inferiority may result if they wear an odd look garment.

Clothing for Pre-adolescents (12 years 15 years)

There is rapid acceleration in growth, as the body is changing and taking on adult characteristics. They are interested in clothes and grooming up. The peer group becomes even more important than elementary school years, in conforming to the dress of the peer group. The pre-adolescent is much more interested in his relationship with others. The child is extremely sensitive to opinion and approvals of others. They give more importance to *becomingness, Prince, beauty and conformity* as compared to durability and comfort. The order of importance of various aspects vary with the income groups for example, low socio-economic group give more importance to durability, comfort and price as compared to high income group.

Clothing for Adolescents (15 to 20 years)

For girls the great acceleration in growth has passed its peak by middle adolescence, although some boys may still be growing rapidly. They are developing emotionally, mentally and socially, but are still far from the poised and popular adult. Both sexes seek increased approval from the peers. Adolescents become more conscious of grooming and personal appearance, particularly in terms of what will attract more attention from and admired by others. They want well-fitted, fashionable and expensive garments. Comfort and serviceability are sacrificed for the sake of style and fashion. They seek acceptance and approval of the peer group. This tends to develop within them a deep conservation and tendency to conform. They embrace clothing as means of demonstrating their conformity. They are greatly interested in clothing and concerned with their physical appearance. Clothing becomes a means of expressing personality.

Clothing for Adult

A person becomes an adult between 18-21 years of age. A person is mature enough to select the clothes on the basis of income, status, occupation, climate, age, sex, occasion and fashion.



A well-dressed person not only appears capable to others but also feels more confident and capable himself. A man's wardrobe is different from a woman. Man's wardrobe includes clothes for business, sports and formal wear. Complete wardrobe for a man includes shirts, trousers, shorts, socks, ties, shoes, nightwear and suit. To an extent of a woman's wardrobe depends on her husband's income, her social activities and her profession. Working woman needs more clothes as compared to a housewife. Those who are socially active also require more clothes than a housewife.

Clothing for Elderly

An aesthetically, clothing can serve three functions for the older person,

Call attention to one's good features

Camouflage poor features

Give a psychologist lift

Older women may have a sagged bust line, increased waist and hip measurements, and rounded shoulders. Therefore, camouflage is necessary; less extreme lines and styles and looser dresses are generally pleasing. Due to change in colour of hair and skin, different colours may now be flattering. Designs, which emphasize the waist, are generally not becoming.

For Women

Knowing the body shape is essential for dressing appropriately for the age. Get in front of a full-length mirror and try on all the clothes in the closet. Get rid of anything that is too tight and too revealing.

Stick with the classic looks. A well-tailored salwar kameez of different styles or blouse with sari always has been in vogue in India.

Follow trends in small doses, do it with accessories such as jewellery and scarves. Wearing a few accessories show that one is still fashion forward but not a slave to clothing trends.

For Men

Choose clothing that fits the body. Buy button-down shirts that fit both the neck and arm measurements, get the pants tailored and don't wear anything that is too tight or too loose.

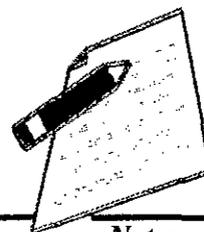
Avoid double-breasted suits.

Wear appropriate casual clothing. Choose jeans and khakis with straight-cut leg and collared cotton polo shirts.

Factors affecting selection of clothing

The selection of clothing should be done on the basis of age, season, income, occasion and fashion.

□ **Age:** While selecting fabric one has to think of the age group of the child. For small children, dainty prints in soft colours can be chosen. Nursery prints are not suitable for elementary school children. When the children enter late childhood stage, the boys like masculine colours, for examples blue, greyish blue, and brown and girls like to wear feminine colours like pink, green and red. Some fabrics, which are delicate, are chosen for girls clothing whereas, rough textured fabrics are suitable for adolescent boys.



The style of the dress also changes according to the age group of the child. The A-line dresses are suitable for toddlers and infants. Later on, dresses with lots of gathers are suitable for girls' frocks. In the same way type of collars are suitable for younger age group, for example baby collar is not suitable for adolescent.

Season: Some fabrics and colours are suitable for winter while others are not, for example synthetics; silk and wool are suitable for winter as they are bad conductor of heat. Cotton and blends of cotton with synthetics are good for summer as they are good conductor of heat and absorptive. There are cool and warm colours. The cool colours are associated with coolness, for example, blue, green, white etc. Warm colours are bad conductors of heat and associated with warmth for example, red, golden yellow and orange. So warm colours are suitable for winter, whereas cool colours are chosen for summer.

Income: Amount of money affects the selection of clothing. Children belonging to high-income group can spend more percentage of money on clothing as compared to low income. They can spend more money on fashionable garments rather than on durable clothes. Parents belonging to low-income group prefer durable clothes rather than delicate ones. So, the preference of the clothing changes according to the income of the family. Low socio-economic growth gives more importance to durability, comfort and price as compared to becomingness and beauty.

Occasion : Selection of clothes also changes according to occasion. For daily wear or informal wear, durable dresses with simple designs can be chosen but for occasional or formal wear novel fabrics with new styles are chosen.

Fashion : Fashionable clothes look beautiful. One looks odd when one goes out of fashion. Few fabrics and colours are in fashion while others are not. Some clothes should be brought according to fashion and others should be simple. Children belonging to high-income group can wear fashionable clothes to great extent as compared to low-income group. Too much of fashion should be avoided.

Quality assurance

Whenever you go shopping you want to buy a product that looks good, is durable and easy to maintain. In a nutshell, you want a good quality product. What are the aids that help you make a good choice? Markings and labels on the fabrics and garments respectively are consumer aids which give you an idea about the quality of the product. Hence you can call them quality indicators.

Labels and Markings

(a) A label is a piece of paper or plastic that is attached to an object in order to give information about the object. A label can tell you what the object is, who has manufactured it and how to use it. Today practically everything we buy has a label on it. Collect any 10 labels and look at the information given on them. You will find that all of these labels have some written information and/or some graphic display. Labels are made of many types of material- e.g., paper, cardboard, fabric, tin or a simple tag attached to the product. In packages these can be a part of the package. The information on labels includes brand names, pictures, designs, date of manufacture, packing, etc., and any other legal material that the manufacturer may care to put on it. What about label on the yardage? What you see at the beginning of each fabric or 'Than' is called a 'marking.'

Markings are shapes or designs printed on the surface of an object specially to give information and for identification. As far as consumer goods are concerned, sometimes we



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just look at the emblem, picture or name by which we may identify the product, e.g., Bombay Dyeing or DCM products.

These are brand labels .

There are descriptive labels, which give the characteristics of the contents of the package such as size and variety of the products. Besides these types there are certification labels that claim approval of some agency other than the producer and clarify that the product meets certain accepted standards. For example, 'Wool mark' is used for pure wool products. There are also care labels which give information regarding washing, ironing, storing, etc., of the product. Another type of labels are designed to tell consumers about composition of a product and what can be expected of it in the way of performance, how it should be cared for and the use to which it may be put. This type of label is called informative label. So, to be really effective they must give sufficient information to the consumer. However, what all is given on a marking may not be meaningful, for example, a name like Lizy bazy is not providing any meaningful information about the composition of the fabric.

Malpractices

You all must have heard about various types of malpractices by traders and/or manufacturers of food items or electrical gadgets. Same is the case with the textiles and clothing sector. It is essential for all of us to know about these and to do the needful to control these.

Some of the commonly observed malpractices in this area are-

- (a) Giving lesser quantity and/or poor quality of the product. Four meters of fabric bought for a suit often turns out to be 3.80 meters when you measure it. The retailer who does this either uses a short measuring rod or stretches the fabric while measuring it.
- (b) Cheating on price. Traders charge more than the price displayed on the item or on the packet containing goods. They name some tax and add it to the price printed on to the label. They may pick up some word on the label, e.g., 'silk finish' and charge extra for it.
- (c) Selling defective goods. There are many places where traders sell materials of seconds as fresh and charge the price of fresh products.
- (d) Providing false, misleading and incomplete labels and markings. When you buy fabric for curtains, the marking should tell about light fastness. If it does not, then it is incomplete information. Similarly, the terms used should be meaningful and not misleading. The information provided should be correct. The information provided on the label on a garment is often quite vague and incomplete. For example, a label on a ready-to-wear garment does not say anything about washing, drying, ironing, and storing of the item.

So, it is essential on our part as consumers to be alert and give no chance to the manufacturer or retailer to practice these malpractices and in case of complaint get in touch with concerned people to file our complaint. There is a Consumer Protection Regulation Act (1988) which covers all the above discussed malpractices



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CARE AND MAINTENANCE OF TEXTILE INTRODUCTION

Introduction

A garment that is properly cared for may be expected to last considerably longer than one that is not cared for adequately. It will look better all through its wear-life.

Care includes three elements namely cleaning, refreshing and storage. Cleaning is usually a more technical and more involved process than storage or refreshing. Washing and dry cleaning are two major overall cleaning methods. Washing may be either hand or machine. For either process there are variations in the required water temperature, the nature of the detergent used, the use of bleach, the length of soaking and agitation time, the method of moisture removal and the method and amount of pressing required.

Washing

Washing is one way of cleaning namely with water and often with some kind of soap / detergent. It is an essential part of good hygiene and health.

1. Principles of Washing and Their Application

Home laundering is an art. It requires patience and practice to learn the right technique. Laundering of clothes consists of two processes - removing dirt from clothes and finishing them to regain the appearance of neatness as a new fabric.

The dirt which soils fabrics may be classified as follows:

Loose dirt resting on the fabric.

Fixed dirt which is held by grease.

Loose dirt is removed by steeping and mechanical means such as brushing and shaking. Fixed dirt is removed by means of absorption or emulsification of washing and dry cleaning. Soap plays an important part in the separation of dirt, but the fact lies how the soapy water is allowed to penetrate the fabric. The essential factor in the process of cleaning therefore is the use of grease solvent or absorbent and an application of hard or delicate pressure to remove the dirt.

1. b) General Procedure for Hand Laundering:

Although most of today's fabrics are either machine washable or dry cleanable, hand washing continues to be important not only for small items but also for certain materials like silk, sheer fabrics where fastness of colour is uncertain, must be washed by hand.

Following are some guides for hand laundering.

Launder fabrics before they become too soiled.

Examine the fabrics thoroughly for spots, small tears or holes.



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Mend all tears or holes and mark spots with thread so that they may be specially treated before or during washing.

Remove any accessories that are not washable.

For delicate fabric use soap with no strong alkali.

2. Washing by Machine

Most washing today is done by washing machines, the great majority of which are the automatic types. In selecting an automatic washing machine, the following are important considerations for the customer.

Capacity of clothes depending on family size

Space available for the machine.

At least two speed variations for different fabrics

The water temperatures

Pressure control rather than time control for filling

More than one full level to handle a small load

Moderate use of electricity

There are certain cautions to observe in using an automatic washer

Turn off the water supply when the machine is not in use, to prevent the hose from recapturing

Remove the articles from the clothing pockets before washing.

Keep hands out of the washer when it is in operation.

Don't over load the machine. Distribute the loads evenly, if the machine vibrates or bang, turn it off at once.

The following are the general procedure:

Before using a washing machine, it is important to study the maker's instruction.

Fill the machine to the water level with warm water. Add soap solution or powder.

See that heavily soiled garments have some soap rubbed in before being placed in the machines.

Sort clothes into white, coloured and delicate fabric.

Load the machine with required quantity of garments

Set the wash cycle, temperature, warm or hot water and timing, switch on for washing

Remove the garments once the washing is over.

Dry the garments in the sunlight or in the shade.

3. Fabric softeners

The purpose of fabric softeners is to make washable fabrics softer, fluffier and less likely to wrinkle, and to make ironing easier. When used on manmade fabrics, softeners are said to cut down on static electricity (clinging of the fabric).

While many different fabric softeners are available, most of them are in liquid form. One type of softener is added to the final rinse water, where as another type is to be put in to the water along with the detergent. With the latter type, it is important to follow instructions carefully because the softener and detergent interact, causing an insoluble precipitate that is difficult to remove.



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Introduction

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BLEACHING

Bleaching is a complex process of removing colouring or discoloured matter from fabrics and made white. In laundering, the only object in using bleach is to remove stains, which do not respond to normal washing processes. Bleaching should be carried out carefully on all fabrics. Bleaching agents are chemicals hence the correct rate and intensity of bleaching is essential so as to avoid damage to the fabric.

On the basis of mode of action, bleaching agents can be classified into three groups as below.

- Oxidizing bleaches
- Reducing bleaches
- Optical bleaches

Oxidizing bleaches: These have oxygen as a chief component which is liberated and on contact with the stain, forms a colourless compound.

Reducing bleaches: These remove the oxygen from certain kind of stains and so, reduce them to a colourless compound.

Amongst the oxidizing bleaches, the following may be mentioned:

Sunlight with moisture, air and grass

Sodium Hypochlorite

Sodium perborate

Hydrogen peroxide

Potassium permanganate

1.a) Sunlight with Moisture, Air and Grass :This is the oldest, easiest, cheapest and perhaps the best method of bleaching cotton and linen, and of removing colouring matter which on contact with oxygen becomes colourless. The oxygen from the air and grass liberated by the sunlight and in conjunction with moisture is the active bleaching agent. The article, particularly the stained part, must be moistened with water and exposed to the sun preferably on grass or shrubs or plants until the colouring matter disappears after which the fabric must be removed immediately. Otherwise, long exposure to the sun will weaken it.

Before bleaching with any of the oxidizing chemical, the metallic buttons and other similar parts if any, must be removed since their oxidation may cause black stains on the fabric.

1.b) Sodium Hypochlorite or Javelle Water: 1lb (480g) washing soda □ 1lb chloride of lime, 1 quart boiling water 2 quarts cold water.

Method: Take a solution of washing soda and boiling water. Mix chloride of lime with



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cold water. Stand the mixture for some time, so as to settle down. Decant the clear liquid and add it to the washing soda solution. This will give sodium hypochlorite and calcium carbonate which will precipitate. Allow the precipitate to settle and then strain off the clean liquid. This must be always stored in coloured bottles as it deteriorates in the light.

Use: Sodium hypochlorite is a strong bleaching agent and can be used on white cotton and linen. Dilute it with equal quantity of hot water and sponge the strained portion with it until the stain is removed. Rinse the fabric in the plain water to wash out any residual amount of bleach.

1.c) Sodium Perborate bleach : It is made by mixing solution of borax and caustic soda with hydrogen peroxide. When mixed with warm water, it gives off oxygen and also forms an alkaline solution of hydrogen peroxide, and is used in the preparation of soap powders.

Method: Dissolve one ounce (about 28g) of chemical in one gallon (about 4 litres) of water. Fortreating animal fibres, neutralize the solution with acetic acid and for bleaching action makes it slightly alkaline with ammonia.

Use: Make a solution of sodium perborate in the proportion of one tea spoon to 1 pint of boiling water. Sponge the stain with this solution, mostly used on white linen and cotton.

1.d) Hydrogen Peroxide : It is used as an antiseptic and a deodorant. It is a mild and useful agent. It must however be used with great care as it may cause serious injury to fabrics. The compound is available in the market as solution of different concentrations. The chemical is very unstable in air. Hence, to maintain the strength for longer, it must be stored in dark air tight bottles at low temperature. This bleach readily splits up into water and oxygen and so colouring matter is oxidized in its presence. This action takes place most rapidly with alkaline solution.

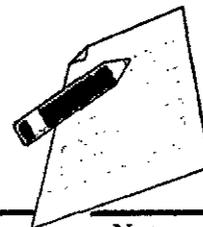
Use: It is a safe bleach on all fabrics and is used for whitening of wool and silk in addition to cotton and linen, which show yellowness due to repeated washings. It must never be allowed to dry in the fabric. The 10-volume strength can be used without dilution for white linen and cottons but for other fabrics, it should be diluted by adding six parts of cold water to one part of hydrogen peroxide. Little ammonia is then added to make the solution alkaline.

1.e) Potassium Permanganate Bleach : This bleach has a high content of oxygen which will combine with, so remove, certain obstinate stains. E.g., perspiration, marking ink and mildew. It can be used on animal as well as vegetable fabrics. A brown colour is left in the fabrics which can be removed by treating it with hydrogen peroxide or oxalic acid. Potassium permanganate is available in the form of crystals and can be easily stored in a bottle.

Method & Use: Make a solution of potassium permanganate in the proportion of one ounce (about 28g) of bleach with one gallon (about 4 litres) of water for cotton and linen fabrics. For animal fabrics the above solution is diluted 2-fold with water. The fabric is steeped in the bleach for few minutes, and then the excess bleach is rinsed out of fabric which has now stained with characteristic brown colour. The article is then dipped in one of the following solution until the brown stain due to bleach is removed.

Sodium hydrosulphite

Oxalic acid solution (28g in 4 litres of water) or
 2% hydrogen peroxide acidified with acetic acid (1 teaspoonful of vinegar for 500ml of bleach)
 The fabric must be rinsed thoroughly in water after treatment with above chemical.



3. Reducing bleaches

a) Sodium hydrosulphite b) Sodium bisulphate c) Sodium thio sulphate

3.a) Sodium Hydrosulphite :This is sold in powder form. When dissolved in water, it readily absorbsoxygen to form sodium metabisulphite. Further, sodium melabisulphite by absorbing oxygen forms sodium sulphite and sulphur dioxide. The sulphur dioxide gets oxidized to sulphuric acid and this gives out by hydrogen. Thus, the removal of stain is brought about in two ways. First the powder takes away oxygen from the stain, thus breaking up the colouring matter and secondly, hydrogen given off by sulphuric acid, removes the broken-up components of the colouring matter. It can be safely used for all kinds of fabrics with the precaution that the temperature of the solution is suited to the fabrics.

Application:For bleaching in solution, the fabrics are steeped for few minutes in solution of 1 to 4teaspoonfuls of the chemical in 1 pint (about 500ml) of hot or boiling water. The concentration of solution varies according to the resistance of stain and the nature of fabric. The fabrics then should be rinsed thoroughly in water containing high concentration of soap.

Uses:The bleach can be used in spotting treatment for many stains due to grass, dung, boot polish,mildew, ink, potassium permanganate and dye stains.

The bleach can also be used for coloured clothes. In such cases, sometimes bleach may accidentally run into the colour to change it. Immediately dipping into an alkaline solution or immediate application of soap may rectify this problem.

Precautions:The bleach is sensitive to decomposition by moisture, heat and oxygen. Sometimes, itmay catch fire. Therefore, it must be stored in air tight, moisture free containers. The bleaching work must be done in the open or near the window to let the released sulphur dioxide escape, which otherwise may cause irritation to throat and lungs.

Further care must be taken during use in avoiding the contact of bleach with metal parts, as it may cause black stain on all fabrics. Vessels of wood or earthenware only should be used.

3.b) Sodium bisulphite :This is very mild reducing agent and is obtained by the partial neutralizationof 'sulphuric acid' with 'caustic soda'.

The bleaching effect of this chemical is due to release of sulphur dioxide which reduces the stain by removing oxygen, to discolour it.**Application:**The stained part of fabric dipped in the bleach until the colour is removed. Therefore, it isthoroughly washed to remove residual chemical and air dried. The last step is essential as any residual sulphur dioxide may absorb atmospheric air to form sulphur trioxide which with water forms sulphuric acid.

3.c) Sodium thiosulphate :This chemical is also a reducing agent which acts through liberation of sulphur dioxide. For bleaching of cotton fabric, hyposolution is obtained by dissolving one ounce (about 28g) of sodium thiosulphate and □ ounce of 36% acetic acid in 8 quarts (about 8 litres) of water. The fabrics are then treated as with sodium bisulphite bleach.

4. Optical bleaches

Optical bleaches are used for white fabrics. These are fluorescent white compounds not true bleaches. e.g., Tinopal . These compounds do not readily bleach but give a white effect. These fluorescent white compounds are absorbed by the fibre and exit a bluish appearance that covers up yellow things the fluorescent colourless dyes convert the invisible ultra-violet rays to visible light.



5. Over bleaching

The over bleaching of cotton and linen fabrics is one of the main causes of general weakness of the fabrics. The fibres become brittle and harsh and give a distinct 'crackle' when rubbed together.

To overcome this problem, following precautions should be used during all bleaching operations:

Use bleach of known strength.

Keep temperature below 60°C

Always measure quantity of bleach accurately, and

Always dilute bleach and add gradually.

In most cases, over-bleaching is due to chlorine bleaches, but oxidizing agents do have the same effect on cotton and linen. Chlorine bleach should never be applied at temperature exceeding 160°F (71°C).

6. Additional Reagents

In addition to soaps and other supplies, certain chemicals and materials are frequently used in laundries for specific purposes. These can be categorized under following groups:

- a) Alkaline reagents
- b) Acidic reagents
- c) Organic solvents, and
- d) Absorbents

a) Alkaline Reagents

(i) Ammonia (Ammonium Hydroxide or Liquor Ammonia): This is a strong alkali and is used for removing greasy stains and scorching on animal fabrics (Solution of 1 to 4 tsp in 500 ml of warm water is used); removing smell of Javelle water; neutralization of remaining acids in fabrics.

However, this chemical causes yellowing of silk and wool, bleaching of colours and tendering of the fabrics, if concentrations, higher than recommended are used. Concentrated ammonia is highly volatile, release high amounts of ammonia gas which causes suffocation and a choking sensation due to its pungent smell. Therefore, either diluted ammonia solution be first prepared or household ammonia be purchased for use. In the period of non-use both concentrated as well as diluted ammonia solution should always be stored in refrigerator.

(ii) Washing Soda (Sodium Carbonate) : This is a most commonly used chemical in laundry work. It is marketed in crystal form which dissolves easily in boiling water. It is often used with soaps to improve their detergent power. The chemical is used for many other purposes such as softening of hard water, neutralization of acids, removal of acid stains from bleached cotton and linen fabrics and emulsification of grease. In addition to the above, washing soda is also used for removal of vegetable stains and, scorching. For this purpose, one to four teaspoons of chemical is dissolved in about 500ml boiling water. The fabric is then treated with this solution when hot, for about 15 minutes and then rinsed in plain water.

Besides the above useful qualities, washing soda sometimes becomes undesirable as it causes yellowing of white fabrics. Further, it is also injurious to skin and hence care should be taken to avoid direct contact of hands, during washing of fabrics for long periods.



(iii) Borax (Sodium Tetraborate) :It is a mild alkaline chemical, soluble in cold water. It can be used on all the fibre types. In market, is available as white crystal-line granules.

Uses:It is used to neutralize acids after stain removal.

It has a bleaching action on cotton and linen fabrics which are yellowed due to repeated washings. Such fabrics are whitened by boiling in solution of borax.

Presence of borax in starch prevents the 'scorching' or 'browning' of starch at high temperatures, used in finishing collars.

b) Acetic Reagents

(i) Acetic acid: The household form of acetic acid is vinegar (about 6% acetic acid). It is available in market in various strengths. Glacial acetic acid is the purest and strongest of all. The acid should not be used in metal vessels, but only in glass, plastic, enamelled or earthenware vessels.

Uses: A weak solution of vinegar (2 teaspoonful in one litre water) is used as a steeping bath to remove over-bluing and as a neutralizing agent.

After washing the fabric, a final rinse in weak acetic acid solution, in addition to fixation of colour also gives an added brightness to the colours.

Rinsing in weak solution of acetic acid retains the original finish of the fabrics made from silk and rayon.

Acetic acid effectively substitutes stronger sulphuric acid used in dyeing of silk.

It helps in correction of finishing faults on cellulose acetate. If cellulose acetate fabrics are finished at too high a temperature, shiny glazed marks are produced on the fabric, which can be mistaken for grease marks. This defect can be removed by immersing the fabric in cold 20% acetic acid solution for about one hour, after which the article without water is wrapped in a cloth and the solution is extracted lightly. Then drying is carried out at about 140°F (60°C).

Precautions: Too much acetic acid may harm wool or silk as these fabrics have high affinity for acids. During subsequent washing, if excess acids not rinsed off, it will split a soap solution to give the fabric a greasy appearance, with a foul smell of fatty acids.

(ii) Oxalic acid: It is highly toxic and is marketed as white crystals. Use: It is used, to remove iron mould and fruit stain,

To bleach the brown stain due to potassium permanganate,

To remove tannin-base of writing ink, in combination with hydrogen peroxide, and

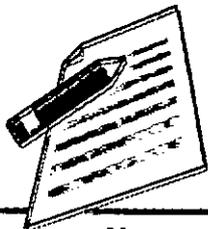
As a cleanser for white straw-hats.

For removing the stains, the article is soaked for about ten minutes in a hot solution of 1 to 4 teaspoonfuls of oxalic acid dissolved in about 500ml of water. It is then thoroughly washed. Then ammonia (100%) or borax is added to neutralize the excess acid.

Precautions :It must not be used on wool or silk as it causes permanent brown stains on such fabrics.

Care must be taken not to treat the article at too high a temperature (not over 140°F, 60°C) or with too strong a solution and chemical must not be allowed to dry in article, as any of the above may weaken the fabric.

Wooden spoons must be used for handling the chemical.



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(iii) **Oleic acid (Olein)** :This belongs to class of fatty acids and forms soap when reacted with analkali.

Uses: It is used for spotting of grease and oil stains. Oleic acid is applied to the stain and allowed to react for about 15 minutes or till the spot is dissolved. The part being treated is squeezed followed by dipping in weak solution of ammonia, which produces the soap. The stain is then rubbed or brushed until it is removed by the lather.

This acid is used to treat cotton and linen. It readily melts wool, tends to discolour silk and is unsuitable for coloured fabrics. It must always be rinsed well from the fabrics, otherwise a rancid odour will develop.

c) Organic Solvents:

Specific organic solvents can be applied to most of the fabrics either to remove stains or to 'Dry clean'. They do not harm the fibre or their colour. However, because of high cost, these are not used at home. Some of the most important solvents used in laundries are described below:

(i) **Cleaning benzene (Petrol)** :This is obtained by distillation of petroleum and is highly inflammable. It should never be stored in large quantities indoor or be used near fire.

Use:It is used for spotting of grease stains and dry-cleaning.

(ii) **Carbon tetra-chloride** :It has action similar to that of petrol, but is more expensive. However, it has the advantage of being non-inflammable, but is highly toxic. Therefore, it should be worked with either in open or near open window, as it is extremely volatile.

Uses: It is solvent which can be used on all fabrics for removal of paint and grease stains.

(iii) **Acetone** :It is very useful solvent for treating many stains. However, it is highly inflammable and also cannot be used for cellulose acetate rayon which is rapidly dissolved in this solvent.

Uses: On fibres, other than cellulose acetate and vinyon, acetone can be effectively applied to remove stains due to paint, nail polish, lipstick, varnish and shoe polish etc.

(iv) **Methylated spirit (alcohol)** :It is alcohol which is artificially coloured and toxified by addition of methyl alcohol, to make it unsafe to drink.

Uses:It is used for removing sealing wax, silver nitrate and other silver stains, but it is not a very effective solvent for organic stains. Its usefulness increases when employed along with soap. Alcohol dissolves acetate rayon, but can be used safely on all other fabrics.

(v) **Paraffin**:This is wax which is a by-product of petroleum refineries.

Uses:It is used in removing grease and paint stains on rubber fittings in laundry appliance.

(vi) **Turpentine** :This is more expensive than paraffin and possesses a distinctive smell. It is inflammable and volatile.

Uses:It is used to destain the fabric spots due to grease, paint, varnish and printer's ink. It can be safely used on all fabrics including acetate and nylon.

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Several absorbents are used in home and in laundries for removal of grease spots from all fabrics as well as for general treatment of light-coloured fabrics that are evenly soiled. These can also be used for articles like, furs, and dark coloured gloves which cannot be cleaned by solvents alone. Examples are French chalk, common-salt, bran, fuller's earth, bread-crumbs, powdered magnesia and other commercial dry-cleaning powders.



Application: To remove the stain or in general cleaning, first of all, brush off the loose dirt from the article and then spread absorbent. Rub it lightly in a circular motion and let it remain for half an hour. Then shake the powder and brush the whole garment.

Bran, moong powder and bread-crumbs are used after light warming. They are useful for cleaning dark-coloured felts, furs, camel-hair cloth and greasy soiled sarees.

Use: The absorbents are used for cleaning grease marks on both light and dark coloured fabric of all kinds, white laces, fur, coats, shawls and felt hats. These do not harm the fabrics in any way.

Identification of stains & treatment

Soaps and detergents are the most important cleansing agents used in laundry work. Soap result from a reaction between natural oils or fats and alkali. If alkali is used in excess it is released when soap is used on the fabric. Synthetic detergents are synthesised from chemicals. Both soaps and detergents are sold in powder, flake, bar and liquid forms. The type of soap or detergent to be used depends on the fibre content, colour and the type of dirt on the fabric. Both soaps and detergents share a critical chemical property – they are surface-active agents or surfactants. In other words, they reduce the surface tension of water. By reducing this effect water soaks more easily in clothes and removes stains and dirt faster. Surfactants and 339 other ingredients in laundry detergents also work to keep the removed soils suspended in the wash water so they do not redeposit on to the clean fabrics. This prevents greying of fabrics.

There are some differences in soaps and detergents. Soaps possess a number of qualities that make them preferable to detergents. As mentioned earlier, they are natural products and less harmful to the skin and environment. Soaps are biodegradable and do not create pollution in our rivers and streams. On the other hand, soap is not effective in hard water, which results in wastage. Another shortcoming of soap is that it is less powerful than synthetic detergent and tends to lose its cleaning power over time. An added benefit of detergent is that they can be specifically engineered for each cleaning task and for use in different types of washing machines.

Once the soap or detergent has emulsified the grease holding the dirt, it has to be held in suspension till it is rinsed out. Some parts of the fabric may have dirt, which is closely adhering to the fabric. The methods employed for washing assist in these two tasks – disassociating the dirt adhering to the fabric and holding it in suspension.

The method selected depends on the fibre content, the type of yarn and fabric construction and the size and weight of the article being washed. The methods of washing are classified as follows: • Friction washing • Kneading and squeezing • Suction • Washing by machines
Let us now discuss these methods in detail.

- (a) **Friction:** This is the most commonly used method. This method of cleaning is suitable for strong fabrics like cottons. Friction may be caused by rubbing one part of the garment against another part of the garment with hands. Alternately using a brush over the dirty parts kept on the palm of the hand or on a scrubbing board if the article is big are also examples of friction washing. Friction is not applied on delicate fabrics like silk and wool and on surfaces like pile, looped or embroidery.
- (b) **Kneading and squeezing:** As the name suggests, this method involves gently rubbing with hands of the article in soap solution. Since the pressure applied in this is very low, it does not harm the texture, colour or weave of the fabric. Thus, the method can be easily



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used to clean delicate fabrics like wool, silk, rayon and coloured fabrics. This method would not be effective for heavily soiled articles.

- (c) Suction washing: This method is used for articles like towels where brush cannot be used and when it is too big or heavy to be handled by kneading and squeezing technique. The article is placed in soap solution in a tub and the suction washer is pressed down and lifted repeatedly. The vacuum created by pressing loosens dirt particles.
- (d) Machine washing: Washing machine is a labour-saving device especially useful for large institutions, like hotels and hospitals. These days a variety of washing machines are available in the market by different companies. The principle behind each is the same. This is to create agitation in the clothes to loosen the dirt. For washing in these machines, pressure is provided by the movement of either the tub in the machine or a central rod attached to the machine. The washing time varies with type of fabric and amount of soiling. Washing machines can be manual, semi-automatic and fully automatic. Finishing After washing it is very important to rinse the article in clean water till it is absolutely free of soap or detergent. Very often in the last rinse some other reagents are added which can help to restore the freshness or brightness of the fabric.

Other reagents may add to the body of the fabric and improve its stiffness or crispness.

(i) Blues and Optical Brighteners: You must have observed that with repeated use and washings white cotton articles tend to lose their whiteness and become yellow in colour. In case of synthetic or manufactured fabrics and their blends the discolouration is more towards grey. The use of blues is recommended to counteract yellowness and to restore the whiteness. They cannot remedy the greyness. Blue is available in the market as ultramarine blue (in the form of a fine powdered pigment) and as liquid chemical dye. Right amount of blueing should be used in the last rinse. The powder blue is pasted with a little amount of water and then added to more water. This solution is used immediately, as on standing this powder tends to settle at the bottom and would give patchy results.

Liquid blues are easier to use and give more even results. Care should be taken to see that blue is applied to the fabric in a thoroughly wet (but not dripping) condition, which is free of folds or wringing. Move the article in the blue solution for a short duration, remove the excess moisture and place it for drying. Optical Brightening Agents or Fluorescent brightening agents are compounds with low grade or weak dyes that possess the property of fluorescence. These compounds can absorb light at a shorter wavelength and re-emit them at a longer wavelength. Treating a fabric with an optical fluorescent brightener can give it an intense bright whiteness, which can counteract both yellowness and greyness. They can also be used on coloured printed fabrics. Optical brighteners are sometimes referred to as whiteners. However, they cannot destroy a colour and therefore should not be confused with bleaching.

(ii) Starches and stiffening agents: Repeated launderings cause loss to body of the fabric, which also loses its gloss and shine. Starching or use of stiffening agents is the most common technique to make the fabric firm, smooth and shiny. This finish not only enhances appearance and texture, but also prevents direct contact of dirt with the fabric. Starching also makes the subsequent washing easier as dirt clings to starch rather than to the fabric. Stiffening agents are derived from nature, either plants or animals. The most common stiffening agents are starch, gum acacia, borax and gelatin. (a) Starch is obtained from wheat (maida), rice, arrow-root, tapioca, etc. They are available powder form in the market and have to be cooked before use. Consistency of starch depends on the thickness of the fabric to be starched. As a



stiffening agent it is used only for cotton and linen. Thick cottons need light starching while thin fabrics need heavy starching. Commercially prepared starches available in the market are easy to use and do not necessarily require hot water for preparation.

Almost all fibres can be identified by appropriate tests. However, it is not possible for the launderer to apply all the methods. Again, identifying and removing stains from textiles are the most difficult tasks in a laundry.

Stain Identification

Three criteria for identifying and classifying the most commonly known types of stains are type of edge, feel and colour.

Type of Edge

We distinguish between strong, clearly defined edges of the stains and less clearly defined stains area, which merge with the fabric. The type of edge is typical in case of the following stains:

Blood stains, Starch stains, White of egg stains, Varnish, Oil paints and Glue

All stains cannot be recognized by the appearance of the edge.

Feel

Here we distinguish between hard and soft stains.

Hard stains are caused by Varnish, oil paints and glues.

Stains, which are less hard but can be described as stiff, are stains containing albumin. When the stain containing albumin is rubbed against a hard object (finger nails) it pulverises and thereby becomes lighter and sometimes vanishes altogether.

Colour

Yellow/brown stains: rust, coffee, tea, tannin, tobacco, juice, banana, sugar, suntan emulsion, urine, perfume, burns and scorches, blood.

Blue Stains: water colour, ink, ball point pens ink, dyes.

Green stains: grass, water colours, ink, ballpoint ink, dyes.

Red stains: water colour, ink, lipsticks, nail varnish, hair dyes.

Stains Removing Procedure

Application of spotting chemicals: Spotting chemicals should be applied by means of a small plastic bottle with a long-necked nozzle. Every endeavour should be made to keep the area to be spotted as confined as possible.

Effect of Steam

Steam from a steam gun serves to heat the chemicals in order to increase their effectiveness. The steam gun must always be handled with great care as the high steam pressure could damage the fabric, dyes or effects the surface properties, and thermoplastic fibre could be irretrievably altered. A distance of 3-4 inches has to be maintaining between fabric surface and steam gun nozzle. An exceptional can be granted for very hard surface.



Notes

Rinsing of stained surface after stain removers

Rinsing off the stain treated spot is very essential, making stain invisible is not sufficient, it can reappear, while doing the pressing or ironing, this spot should be rinsed thoroughly several times so that all the chemicals are removed from the surface.

Formation of Spotting Rings

Always apply the spotting chemical on the outer edge of the stained area and treat the stain. Then rinse the spotted surface several times by forming a ring. Work the edge towards the centre when drying with compressed air, i.e., begin with blowing at the outer zone and gradually shifting liquid towards the centre.

Dry-cleaning

Dry-cleaning can be defined as the cleaning of fabrics in a non-aqueous liquid medium. The important difference between dry and wet solvents is that while water is absorbed by the fibres, which causes shrinkage, wrinkle formation and colour bleeding; the dry solvents do not cause fibre swelling. Hence dry-cleaning is a safe method for cleaning delicate textiles. For dry-cleaning, the most common solvents used are perchloro-ethylene, a petroleum solvent, or a fluorocarbon solvent. Dry-cleaning is generally done in industrial establishments and not at the domestic level. The items are brought to the cleaner's and identified with a tag that includes special instructions. Items are first inspected and treated at a spot board. Because a solvent is used, stains that are water-soluble and other hard-to-remove spots must be treated on the spot board. Customers who identify the stains for the dry cleaner make the cleaning task easier and ultimately improve their satisfaction with the cleaned product. Additional treatment that many dry cleaners are equipped to do include replacing buttons, doing minor repairs to items, replacing sizing, water repellency and other finishes like permanent creases, moth proofing and cleaning fur and leather. Some dry cleaners also clean and sanitise feather pillows, blankets, quilts and carpets, and clean and press draperies.

Storage of clothes

Clothes require care not only during their use but also while they are stored. The weather is not the same all the year round, hence the need for specific fabrics for specific weather conditions necessitates the storage of clothes not needed at the particular time. If large number of clothes are there, a small room or store can be used for the purpose, otherwise a cupboard or a shelf can also be used.

1. A good storage space should have certain desirable features.
 - a). It should be clear, dry and free of humidity.
 - b). It should be well lighted and not very dark.
 - c). The shelves should be in plenty and smooth. These should not be too high because it becomes difficult to store the clothes.
 - d). The shelves should be deep.
 - e). They should be covered with paper.
 - f). Drawers can also be used to store clothes and are safer as compared to shelves.
 - g). If a cupboard is used, the door should be properly closed.
 - h). The storage space should be dry, insect free and away from dust and dirt.



Notes

2. Considerations or steps while storing clothes
 - a). The clothes must be dust free. They must be brushed, pocket must be emptied, and exposed to sun before storing.
 - b). The garments that require washing must be washed before storing. Those require dry clean must be dry cleaned.
 - c). Airing must be done in boxes or cupboard as well as clothes before putting away.
 - d). Clothes must not be kept in damp condition. Moisture causes mildew which may damage the clothes. So, storage must be done in dry condition.
 - e). The cupboard or storage box must be lined with paper or old clean cloth sheet.
 - f). The storage space must be sprayed or dusted with an insecticide to prevent damage from insect, moths etc.
 - g). Repellents such as tobacco, dried neem leaves etc. can be used in the storage. Naphthalene balls and Odonil etc. are quite effective. Even camphor is considered to be useful.
 - h). Newspaper can be used for wrapping woollens as moths dislike printing ink.
 - i). Fumigation (smoke) with poisonous gas like hydrocyanide is also useful. Though it kills moths, it is very dangerous and requires special handling. This is done on large scale.
 - j). Clothes must be packed up tightly in one area for example coats, over-coats at one place, cardigans and pullovers at one place, sarees at different place etc.
 - k). New white cloth must be wrapped up so as to avoid yellowing, if they are to be stored for long time.
 - l). If clothes are to be stored for long time, one must keep changing their folds as some clothes can crack at folds.
 - m). It is better to pack each article of clothing in polythene bags separately before storing.
 - n). Never store starched clothes for a long time.
 - o). Store sparingly used articles in on topmost shelves. Place very heavy ones in the lowest shelves, for comfort in handling them.
 - p). Drawers can be placed in sunlight occasionally to remove moisture and all insects.
 - q). Soiled clothing items must never be stored, for it has many disadvantages. The stains may become set and permanent it is more easily attacked by moths, insects and mildew.
 - r). Mend all tears before storing to prevent it from getting larger.

SUMMARY

When you buy textile goods in a store, you choose things for different reasons: because they are brightly coloured, soft and perhaps warm, or have some other special qualities. But do you know how the textiles end up looking and feeling the way they do? It is done through a process called textile finishing. Textile finishing is the term for chemical and mechanical processes used on textiles after they have been made. One important note: textile finishing does not include processes like dyeing that add colour to textiles, but it can make fabrics more welcoming to dyes. Right after new textiles have been made, they are called gray goods because they're still in their natural colour, and sometimes they are rough and unappealing. The



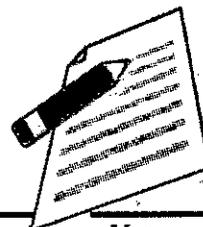
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industrial processes involved in making textiles can leave them dirty and not yet ready for use in making products like clothing. Textile finishing produces results that make textiles more appealing and usable to the consumer. Finishing steps may take place before and after fabric has been dyed. Over time, many such processes have been invented. One simple finishing process, steaming, removes wrinkles. Some finishing processes make textiles softer to the touch. Others make them crisper and more durable. There are finishing processes that control shrinkage, and others that add special qualities such as stain-resistance, waterproofing, or repellence to insects. Clothing selection for the family presents a greater challenge today than in past generations. Custom and habits are no longer adequate criteria for clothing decisions. The kind and variety of clothes available today seem almost limitless, as a result of the new technology and its accompanying mass production of garments. The inventions of the man-made fibres have been one of the most important stimulants in the recent revolution in clothing and textiles. These fibres have increased greatly the variety and types of clothing available to families. The rising income over the last quarter century has made it possible for families of all income levels in the country to exercise choice in the area of clothing. All these factors have influenced the range and emphasized the importance of decision to be made by families in providing clothing for their members.

EXERCISE

Review Questions

1. What is Fabric science?
2. What is Fabric?
3. What is fibre?
4. What is dry cleaning?
5. What is quality assurance?
6. What are malpractices?
7. Discuss the clothing selection for the family in detail?
8. Explain the process of laundering?
9. Discuss the methods of storage of clothes?
10. Discuss the ways of maintenance of clothes in good condition?
11. Discuss the types and properties of fibre?
12. Explain the types and properties of yarn?
13. Explain the process of yarn reconstruction?
14. Explain the concept of knitting and weaving in detail?
15. Discuss the types of finishes and their properties?



Notes

26

INTRODUCTION TO HOUSE
KEEPING

- Understand the concept of Housekeeping.
- Understand the importance of housekeeping.
- Understand the concept of cleaning.
- Understand the methods of cleaning.
- Discuss the methods of floor and wall decoration.
- Understand the flower arrangement.
- Discuss the types of cleaning.

Objective of the Module:

The basic objective of this chapter is to through some light on the initial concepts of housekeeping so that the methods and types of cleaning as well as accessories of home cleaning can be learned.

Definition of Housekeeping

Housekeeping may be defined as 'provision of a clean, comfortable, safe and aesthetically appealing environment'. By another definition, 'housekeeping is an operational department in a hotel, which is responsible for cleanliness, maintenance, aesthetic upkeep of rooms, public areas, back areas and the surroundings.

The term Housekeeping outside the hospitality, hospitals refers to the management of daily duties and chores involved in the running of a household, such as cleaning, cooking, home maintenance, shopping, and bill payment etc. These daily recurring tasks may be performed by any members of the household, or by other persons like butler or maids who are hired for the purpose.

Role/importance of Housekeeping

Housekeeping department in hotel ensures the cleanliness, maintenance, and aesthetic appeal of all rooms and public areas. The housekeeping department not only turnarounds (prepares and clean guestrooms) on a timely manner it also cleans and maintains everything in the hotel so that the property is as fresh and attractive similar to the day when it opened the doors for the business.

The effort that the housekeeping makes in giving a guest a desirable room has a direct bearing on the guest's experience in a hotel. There are more employees working in the housekeeping department when compared to any other hotel departments.

Being responsible for the turnaround of the rooms in a timely manner, house keepings primary communications are with the front desk/reception team. Each room status is updated

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on a regular basis from the housekeeping to the front desk and vice versa. With new technologies available a room status update can be done via the hotel software, telephone systems, housekeeping mobile applications etc.

Housekeeping also coordinates closely with the maintenance or engineering department, as the housekeeping staff identifies different types of maintenance issues while cleaning the rooms and reports to the maintenance team for rectification or replacement. Example snags or issue with the TV, AC, Heating unit, Plumbing, Lighting, Electrical faults, Furniture, Toilet, Vanity, Tub, Towels racks, Ventilation issues etc.

The role of housekeeping can change depending upon the type or category of the hotel, for example only in a luxury or full-service hotel evening or turndown services are offered by the housekeeping department. The housekeeping department is one of the major 'Support Centre' in the hotel as it does not generate any major revenue for the hotel.

Housekeeping is considered as a 'back of the house' department even though they have some direct contact to the guests; like for example while cleaning rooms, picking up laundry, providing evening or turndown services etc.

Housekeeping Department Organizational Chart

Housekeeping organizational chart provides a clear picture of the line of authority, the housekeeping department in a large hotel or 5 Star Hotel is headed by the executive housekeeper. He/she reports to the general manager, or to the resident manager, or the rooms division manager in a large hotel. In the case of a chain of hotels, the executive housekeeper also reports to the director of housekeeping, who heads the housekeeping departments in all the hotels of that chain.

The deputy housekeeper assists the executive housekeeper and looks after the various areas of responsibility in the hotel, that is, floors, public areas, the linen room, desk control and staffing etc.

The Housekeeping Organizational Chart in a large hotel also contains multiple supervisors for each section of the housekeeping like the Laundry, Desk Control, Floor Supervisor, Public Area Supervisor, Night Supervisor etc. each of these supervisors' reports to the Assistant Housekeeper or the Executive housekeeper.

Areas/Different Sections in the Housekeeping

Executive Housekeeper's office: An Executive housekeeper has to plan, counsel, brief and meets her subordinates. It should preferably be a glass-panelled office so as to give her/him a view of what is happening outside the office. The office should be led by a cabin for the secretary who would control movement into the housekeeper's office.

Desk control room: This room acts as a nerve system centre for coordination and communication with the front office and other departments. The desk control room should have a large notice board to pin up staff schedules and day to day instructions. The desk control room is the point where all staff report for duty and check out at the duty end.

Linen room: This is the room where current linens are stored for issue and receipt. The room should be large airy and free from heat and humidity. It should have adequate shelves, easily accessible to stack all linen. It should be secured and offer no possibilities of pilferage. The linen room should have a counter, across which the exchange of linen takes place. The room should preferably be adjoining the laundry so as to supply linen to and from the laundry.



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Linen room store: This room stores the stock of new linen & cloth materials for uniform, etc. the stock maintained should be enough to replenish the whole hotel at a time. However, these stocks are only touched when the current linen in circulation falls short due to shortage, damage or loss. The room should be cool and dry with ample shelves, generally 6» above the ground.

Uniform room: This room stocks the uniform in urgent use. It is possible that smaller hotel may choose to combine the uniform room with the linen room. A separate uniform room really depends upon the volume of uniforms in circulation. The only difference will be that the uniform room would have adequate hanging facilities as many uniforms are best maintained when hung.

Tailor's room: This room is kept for house tailors who attend to the stitching and patch-up work of linen and uniforms. Room is avoided if the mending and the stitching jobs are done in contract basis.

Lost and found section: This section should be small and airy with cupboards to store guest articles lost and maybe claimed later.

Flower room: This should be an air-conditioned room to keep flowers fresh. The room should have a work table, a sink with a water supply and all necessary tools required for flower arrangement.

Laundry: This is an important section under housekeeping which is responsible for the cleaning of all fabrics used in the hotel. The section should be adjacent to the linen room so as to avoid excessive steps. Laundry should ensure the cleanness and drying of all guest clothes, employee uniforms and linen to the best-assured standard.

Functions of housekeeper

This housekeeper sample job description can be used to help you create a job advert that will attract candidates who are qualified for the job. Feel free to revise this job description to meet your specific job duties and job requirements.

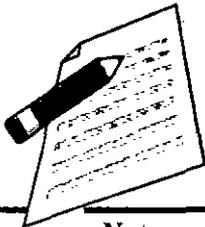
Cleaning and maintaining a private residence or commercial building to make sure that it meets any housekeeping sanitation requirements (for commercial buildings, such as healthcare facilities, restaurants, and government agencies) and provides a comfortable space for residents or employees.

Housekeeper Job Duties

- Dusting and polishing furniture and fixtures
- Cleaning and sanitising toilets, showers/bathtubs, countertops, and sinks
- Maintaining a clean and sanitary kitchen area
- Making beds and changing linens
- Washing windows
- Vacuuming and cleaning carpets and rugs
- Sweeping/vacuuming, polishing, and mopping hard floors
- Sorting, washing, loading, and unloading laundry
- Ironing clothing items
- Using any cleaning equipment such as vacuums, mops, and other cleaning tools
- Keeping bathrooms stocked with clean linens, toiletries, and other supplies
- Cleaning mirrors and other glass surfaces

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- Emptying trash receptacles and disposing of waste
- Steaming and cleaning draperies
- Washing blinds
- Tidying up rooms
- Monitoring cleaning supplies and ordering more as needed
- Reporting any necessary repairs or replacements

Personal grooming of the house keeper

1) Report on Duty :

Present yourself in a tidy appearance toward our customer and represent highest standards of service. Report on duty 5 – 10 minutes before your shift starts.

2) Staff grooming & hygiene:

- Brush your hair before going on duty.
- Ensure that shoes are clean and polished before going on duty.
- Females must wear appropriate stockings with black court shoes where heels do not exceed two inches.
- Males must wear black socks and shoes.
- Change your uniform regularly at Housekeeping Linen Room.
- Clean pressed uniforms must be worn with neatly brushed hair, polished shoes, clean name badge and no buttons missing.
- Contact Housekeeping Uniform Linen Room if buttons are missing.
- Contact HR Department if your name badge is damaged or lost.
- Change your socks/stockings daily.
- Ensure nails are well-trimmed, only clear or pale nail polish for female staff
- Only one ring and watch is permitted, small earrings for female staff.
- Take a bath daily.
- Brush your teeth daily and always wear a smile. Use breath freshener if necessary.
- Teeth should be clean and the breath must be fresh. This can be achieved by cleaning the teeth regularly and visiting the dentist for check-ups on a regular basis.
- Deodorant/eau de toilette cologne/aftershave may be used but not so much that it is offensive.
- Earrings, beards and moustaches are forbidden for male staff.
- Light cosmetics with colours that complement the uniform and skin tones may be worn. Lipstick of a suitable colour must be worn at all times.
- If make-up is worn it should be light and natural-looking. Avoid vivid colours, like bright blues or violets around the eyes, and make sure the blusher does not look too dramatic. Bright lipstick colours should also be avoided.
- Be aware of your posture. Walk briskly with a straight back and do not lean on walls.
- Never run in the lobby.
- Check your appearance in a mirror in the locker rooms before going on duty.
- Female hair length beyond the shoulder must be neatly tied/ bundled.
- Men must have short well-combed hair which doesn't extend below the collar or over the ears.



Notes

- Avoid excessive use of hairsprays and gels, as they can make the hair look stiff and unnatural.
- Do not use unnatural hair-colours e.g., green, blue, unnatural blond etc.

Areas Under the Responsibility Of Housekeeping

Staffs of the Housekeeping department have very little or no guest contacts in some scenarios, this is mostly due to the fact that most of the work carried out by the housekeeping staffs are in the back of the house area. Hence, housekeeping is considered as aback of the housedepartment.

Even though housekeeping is a back of the house department they are still responsible for the maintaining and up-keeping of the house areas and also back of the house areas alike. Below diagram shows the areas which come under the responsibility of the housekeeping.

Main Responsibilities of Housekeeping

- To ensure well-furnished and maintained guestrooms and public areas.
- To ensure excellence in housekeeping sanitation, safety, comfort and aesthetics for hotel guests.
- To oversee the coordination of and administer all housekeeping programs and projects.
- To act as a source of contact in interdepartmental communications, vendors, professional agencies etc.
- To act provide a budget, budget control, and forecasting related to housekeeping.
- To achieve the maximum efficiency in ensuring the care and comfort of guests & in the smooth functioning of the department.
- To establish a welcoming atmosphere.
- To ensure courteousness, reliable service from all staff to the guest.
- To ensure a high standard of cleanliness and general upkeep in all areas for which the department is responsible.
- To provide linen in rooms, restaurants, banquet halls, conference halls, health club etc, as well as to maintain an inventory for the same.
- To provide uniforms for all the staff & maintain inventory for the same.
- To Cater to the laundering requirements of hotel linen, staff uniforms, and guests.
- To provide & maintain the floral decorations and to maintain the land scaped are as of the hotel.
- To select the right contractors & ensure the quality of work is maintained.
- To co-ordinate renovation and refurbishing of the property in consultation with the management & with interior designers.
- To co-ordinate with the purchasing department for the procurement of guest supplies, cleaning agents, equipment, fabrics, carpets, & other items used in the hotel.
- To deal with lost & found articles.
- Carpet shampooing and maintaining.
- Dealing with any guest queries, complaints & requests as they occur.
- To keep the general manager or administrator informed of all matters requiring attention.



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CLEANING AND CLEANING MATERIALS

Cleaning Equipment Used in Housekeeping

Efficient cleaning and maintenance are dependent upon high-quality cleaning equipment, correctly using. Though only 5-10% of the overall cost incurred on cleaning is accounted for by cleaning equipment and agents, selecting the ideal equipment plays a major role in the cleaning process. There will often be several ways of carrying out any particular cleaning task and different types of equipment that can be employed for it.

It is the executive housekeeper's responsibility to select the most appropriate piece of equipment according to the hotel's requirement. Most types of cleaning equipment fall under the category of recycled items, but a few large pieces of items may be considered as fixed assets. The correct choice of quality cleaning equipment could save costs due to breakdowns, reduce fatigue and also ensure overall efficiency in operations.

The equipment used in the cleaning of the surface, furniture and fittings in a hotel building includes both 1) Manual Equipment and 2) Mechanical Equipment.

1. **Manual Equipment:** Manual equipment can include all types of equipment that clean or aid in the cleaning process by directly using manoeuvre, operation and energy of employees. Examples of Manual cleaning equipment are Brushes, Mops, Brooms, Cloths, Polish applicators, Containers, Buckets etc.
2. **Mechanical Equipment:** The various pieces of mechanical equipment used in the housekeeping department are usually powered by electricity or gas. The staff should be well-trained in the operation of this equipment since incorrect usage will not only lead to inefficient cleaning but may also become a safety hazard. Examples of mechanical equipment used in housekeeping are Vacuum cleaners, Electric brooms, Wet-and-dry vacuum cleaners, floor maintenance machine for scrubbing, buffing polishing etc.

Methods of cleaning

Types of Cleaning procedures in Hotel Housekeeping

The Executive Housekeeper is responsible for seeing that the housekeeping staff follow the standard cleaning procedures and methods. He/she should also oversee that proper tools (mechanized or non-mechanized) are used to carry out their assigned tasks. Floors and carpets in the hotel require regular cleaning and finishing to retain their appearance and durability. Deciding when and how carpets and floors should be cleaned is an important task and this important task is further complicated by the different available cleaning procedures, machines and solutions. Cleaning processes in housekeeping can be either manual or mechanical. They may involve different methods like washing (using water as a cleaning and rinsing agent), friction (as in using an abrasive), static electricity (by using a static mop), suction (by using a vacuum cleaner), or by force (by using pressurized water). The various types of cleaning processes are summarized in this section.

Manual Cleaning Methods - Which do not require mechanized or electronic equipment:-

1) Sweeping:

What is the process involved in sweeping?

- Sweeping is done to collect dust when the floor surface is too rough for a dust mop.
- Push brooms are used for large areas & corn brooms are best for corners & tight spaces.
- A broom with a long handle is most suitable ergonomically.
- Start the sweeping process in the back corner of the room or area and away from the door or exit.
- Use short, smooth strokes and sweep directly into a long-handled dustpan without dissipating the dust.
- Keep the head of the broom flat on the floor at all times.

When using a long-handled broom, use smooth strokes to sweep away from yourself.

- It is important in sweeping to develop a rhythm and 'bounce' the push broom to avoid rolling the bristles under.
- Use the broom to sweep dirt into a small pile.
- Pick up the dirt using dustpan before sweeping further.
- Empty the dirt from the dustpan into the trash bag on your cart.

What are the Cons of sweeping?

- Sweeping is not the most efficient, hygienic, or advanced way of removing dust, as so much of it becomes airborne.
- Sweeping has in many cases been replaced by the use of suction cleaners now.

What is the Equipment required for sweeping?

- A broom, a dustpan, a trash bag and a stocked public-space cleaning cart.

2) Dusting:

What is the process involved in dusting?

- This task requires a systematic and orderly approach for efficiency & ease.
- Room attendants should start dusting articles at the door & work clockwise around the room.
- This minimizes the chances of overlooking a spot.
- Always fold the duster three times & then thrice again, with this method you can get 18 clean folds and thus making the duster more effective.
- No corners of the duster should be left hanging.
- A soft, lint-free cloth should be used as a duster.
- Avoid using old rags, which leave behind their own dust and lint.
- In all cases, begin dusting from the highest surfaces so that dust does not fall on items already cleaned.
- In case a dusting solution is used, spray a small amount onto the cloth.





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- Never spray dusting solution directly onto the surface being cleaned as it can stain or cause stickiness.
- The duster should not be unfolded in the room after dusting, nor be shaken outside the window.
- Carry the duster away carefully to such a place where it can be washed & dried.

What are the cons or disadvantages of dusting?

Dusting can strip the dust particles and the dust might settle down in other areas.

- Dust, allergens, and other particles will be floating through Air when dusting with a dry cloth.
- Never spray dusting solutions directly to the surface as it might create stain or stickiness.

What are the Equipment & agents required for dusting?

- Cloth duster, MicroFibreCloths, Feather duster & dusting solution if necessary.

3) Damp dusting:

What is the process of damp dusting?

- This is the most preferred way of cleaning in hotels as surfaces can be wiped as well as dusted, removing any sticky or dirty marks at the same time.
- A suitable lint-free cloth at the correct level of dampness should be used so as to avoid leaving any smears.
- A Dusting solution can be also used by spraying a small amount into the dust cloth.
- Damp dusting should be avoided on all electrical and electronic equipment.

What are the Equipment & agents required for damp dusting?

- Cloth duster, water, plastic bowl, & a neutral detergent if necessary.

4) Dust Mopping / Dry Mopping/ Mop Sweeping:

What is the process of Floor Dust Mopping?

- This is the preferred way to remove dust, sand or grit from the floor.
- If the dust and other substances are not removed from the floor on a daily basis, they will continually scratch the surface finish, diminishing its lustre, & will eventually penetrate down to the floor itself.
- Dust- mopping is done with a dust control –mop, that may or may not be impregnated with cleaning solution.
- Using such a solution stops the dust from rising.
- While dust- mopping, use figure of eight strokes & keep the mop head on the floor at all times.
- Do not drag the mop straight backwards.
- On finishing each figure of eight, swivel the mop around & on the return, pass & overlap the areas that have been wiped by about 8 inches.
- When sweeping in open spaces, clean in long straight lanes, covering the whole area by moving up & down.
- Use a dustpan to sweep up accumulated thrash.
- Always carry the mop head upwards very carefully after you are done, & then shake into a bag to clean.



What are the cons or disadvantages of Dry Mopping the Floor?

- Dust mopping removes gross soil but also redistributes &/or leaves behind large amounts of fine particulates.
- What are the Equipment & agents required for Dry Mopping the Floor?
- Dust control mop, dust pan, dust- collecting bag, & dustbin.

5) Spot Mopping:

What is the process of Spot Mopping?

- Spot mopping is essential to the preservation of floor surface.
- Liquids & solids that are spilt on the floor, if left for any length of time, may penetrate the finish & stain the floor.
- Even acids from fruit juices may wreak havoc on a floor if they are not immediately cleaned up.
- Clean, cold water should be used so that the finish on a floor is not softened.
- Setup Caution Signs before starting the mopping. Detergents should be avoided unless necessary- that is, unless the substance has been allowed to dry on the floor.
- Mop the floor with a damp cloth.
- Let the floor air dry.

What are the Equipment & agents required for Spot Mopping the Floor?

- Mop & bucket or a mop- wringer trolley, cold water, & a very dilute solution of neutral detergent if necessary.

6) Wet mopping / Damp mopping:

What is the process of Wet Mopping?

- A damp mop is used to remove spills & adhered soil that was not removed during the dry removal process.
- Wet-mopping will remove light to heavy soil from the floor surface, which could otherwise become embedded in the surface or encapsulated in the seal or finish.
- Before the floor can be wet- mopped it must be dust mopped.
- Add neutral or mild alkaline detergent to mop water for wet-mopping.
- The detergent used must be of the variety that needs no rinsing or else spray diluted from spray bottle & mop with a damp mop.
- Mix the appropriate cleaner with water in the mop bucket and apply it to the floor.
- If using mop water, immerse the mop in the bucket & wring it out until it is only damp.
- First, finish mopping near baseboards in smooth strokes.
- Then mop the entire area with the figure- eight strokes.
- The water in the bucket should be changed when it becomes dirty.
- A brush may be used for stubborn spots & a squeegee should be used to help speed the drying of the floor.
- Empty the mop bucket, rinse it with clean water and hand it to dry.

What are the Equipment & agents required for Damp Mopping?

- Caution signs, floor cleaner, wet mop & bucket or mop- wringer trolley, squeegee, & detergent solution.



7) Manual Scrubbing:

What is the process of Manual Scrubbing?

- For modern surfaces, very little hand -scrubbing is required.
- Scrub gently in straight lines away from yourself, working backwards.
- Rinse well in order to remove any detergent from the surface.
- Use a squeegee to clear away excess rinse water. Follow up with mopping.

What are the Equipment & agents required for Manual Scrubbing?

- Long-handled scrubbing brush, mild detergent, bucket, squeegee, water, & mop.

8) Manual polishing:

What is the process of Manual Polishing?

- Apply the polish sparingly.
- Use cotton rags to apply polish & a cloth for buffing.
- Use a soft brush for carved articles to get the polish into crevices.
- Always use the polish appropriate for a particular surface. For example, use proprietary polishes for metals like Brasso, Silver, & so on- should be used on these surfaces.

What are the Equipment & agents required for Manual Polishing?

- Use proprietary polish for each type of floor or surface, clean cotton rags.

9) Spot Cleaning:

What is the process of Spot Cleaning?

- This refers to the removal of stains from different kinds of hard & soft surfaces.
- To remove a localized stain, the whole surface need not be treated with stain-removal reagents.
- Just the area where the stain discolours the surface is treated & cleaned in the process of spot cleaning.
- Spot cleaning may be used as a cleaning method on walls, fabric, carpets or flooring.

What are the Equipment & agents required for Spot Cleaning?

- Cleaning Cloths, solvents, cleaning agents, brushes etc.

Mechanised Cleaning Methods -These utilize equipment powered by electricity as well as mechanical equipment:-

1) Suction Cleaning:

What is the process of Suction Cleaning or Vacuum cleaning?

- This is the basic & preparatory step to all other mechanized procedures & should be performed regularly.
- Very often it must also be repeated at end of these processes.
- The goal is to remove as much dry soil as possible so that it does not spread, scratch the finish, or damage the surface.



- Remove dirt from room corners and carpet edges.
- Plug in the vacuum cleaning to an appropriate power point.
- Vacuum from one side of the room to the other.
- Vacuuming with high filtration machines is the most complete method of dry soil removal as it picks up, packages, & removes soil without spreading it around.
- Wet vacuum cleaners are now available, which help to mop water from floors as well.
- These are usually dual- function machines that can be used for both wet & dry work.
- Extraction machines for cleaning carpets also work on the principle of suction.

What are the Equipment & agents required for Cleaning or Vacuum cleaning?

- Caution signs, a stiff broom, wet/dry vacuum cleaner with attachments & a mild detergent for wet cleaning if necessary.

2) Spray buffing:

What is the process of Spray Buffing?

- This process uses a 175- or 300-rpm (revolutions per minute) floor machine & a soft pad or brush.
- The operator sprays a light mist of a commercial cleaning preparation or detergent & a finishing solution in front of the machine.
- As the machine goes over the area, soil, scuffs, light scratches, & marks are removed & the shine is restored to the surface.
- Vacuuming or dust-mopping is a follow-up step to remove loosened dirt.

What are the Equipment & agents required for Spray Buffing?

- The equipment & agents required are a 175 –or 300-rpm buffing machine with beige pad, spray bottle, detergent, & finishing solution.

3) Polishing:

What is the process

- This process uses a 175- 1500-rpm floor machine & a soft pad or brush to remove some soil & brush to remove some soil & put the shine back in the finish.
- Vacuuming or dust- mopping should be carried out as a follow- up step to remove loosened dirt.

What are the Equipment & agents required for Spot Cleaning?

- A 1500 – 2500 rpm floor machine.

4) Scrubbing:

What is the process of Scrubbing?

- This process removes embedded dirt, marks, deeper scuffs, & scratches from the floor along with some of the finish.
- The pad or brush, the type of detergent, the water temperature, & the weight & speed of the machine all determine whether the process is considered light or heavy scrubbing.
- For instance, aggressive pads, higher- pH detergents solutions & fast, heavy machines perform the deepest scrubbing.



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- Light scrubbing removes just one or two coats of finish. Heavy scrubbing removes all or most of the finish, down to the protective sealing coat.

What are the Equipment & agents required for Scrubbing?

- Floor-maintenance machines with a green pad.

5) Stripping:

What is the process of Stripping?

- This is a very aggressive process that requires removing all of the floor finish & sealer, leaving a bare floor ready for refinishing.
- A strong stripping agent, a coarse pad or brush, hot water, & intensive labour make stripping a costly, time-consuming, & sometimes an even hazardous process, which should be used only when no other process will achieve the desired results.
- Diligent use of other maintenance procedures delays the need for stripping.

What are the Equipment & agents required for Stripping?

- A floor-maintenance machine with a black pad.

6) Laundering:

What is the process of Laundry?

- This is the cleaning method used for washable fabrics.
- It is a process in which soil & stains are removed from textiles in an aqueous medium.
- It involves the subroutines of washing, bleaching, drying & pressing, all carried out using specialized laundry equipment & cleaning agents.
- Other sub-processes such as spot cleaning, starching, & softening may also be involved.

What are the Equipment & agents required for Laundering?

- Washing Machines, Drying Machines, Steam Cabinets and Tunnels, Flatwork Irons, Folding Machine, Washing Chemicals and Detergents.

7) Dry Cleaning:

What is the process of Dry Cleaning?

- This is the method in which soil & stains are removed from textiles in a non-aqueous medium.
- Dry cleaning is any cleaning process for clothing and textiles using a chemical solvent other than water.
- It is used to clean fabrics that degrade in water, and delicate fabrics that cannot withstand the rough and tumble of a washing machine and clothes dryer.

What are the Equipment & agents required for Dry Cleaning?

- Chemical Solvents, Dry Cleaning Machine



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MAINTENANCE OF PREMISES

Maintenance of different premises

The Housekeeping department often takes the first step to maintenance functions for which the engineering department is ultimately responsible. There are three kinds of maintenance activities:

- 1) Routine Maintenance
- 2) Preventive Maintenance
- 3) Schedule Maintenance

Routine Maintenance:

These are activities those which relate to the general up-keeping of the property, occur on a regular daily or weekly basis, and require relatively minimal training or skills. These are maintenance activities which occur outside of a formal work order system and for which no specific maintenance records are kept.

Examples:- Sweeping carpets, washing floors, cleaning readily accessible windows, cutting grass, cleaning guestrooms, replacing burned-out light bulbs etc.

Many of these routine maintenance activities are carried out by the housekeeping department and no job order is sent to the engineering department.

Preventive maintenance:

Preventive maintenance consists of three parts: inspection, minor corrections, and work-order initiation. Inspections are performed by housekeeping staff in the normal course of their duties. Examples:- Room attendants and inspectors may regularly check guestrooms for leaking faucets, cracked caulking around bathroom fixtures, and other items that may call for attention by engineering staff.

Attending to leaking faucets and improper caulking around sinks and tubs can control maintenance costs by preventing greater problems, such as ceiling or wall damage in the bath below.

Communication between housekeeping and engineering should be efficient so that minor repairs can be handled while the room attendant is cleaning the room. Preventive maintenance by its nature sometimes identifies problems and needs beyond the scope of a minor correction. These problems are brought to the attention of engineering through the work order system.

Scheduled Maintenance:

Scheduled maintenance activities are initiated at the hotel based on a formal work order or similar document. Work orders are a key element in communication between housekeeping

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and engineering. Example: when a member of the housekeeping department fills out a work order form, one copy is sent to the executive housekeeper and two copies to engineering. The chief engineer gets one of these copiers and gives the other to the maintenance staff assigned to the repair.

Common Household Repair

Buying a house is everyone's dream, but it usually comes at a steep cost. The down payment, closing costs, mortgage, property taxes, and furnishing and decorating all add up. However, many people forget about one of the biggest costs that comes with home ownership: repairs. There really is no escaping it. If you own a house, repair issues will always pop up. Preventive maintenance can definitely help. However, there are some that you just cannot avoid. Some home repair issues are easy to fix while others leave you in a world of financial ruin if they happen at the wrong time. Some you can predict while most creep up on you, forcing you to spend money you had not planned to use before.

In no set order, here are the most common home repairs every homeowner needs to be aware of and prepared for.

1 – Roof Repair

The roof is one of, if not the most, important parts of your home. After all, it protects it from the elements. However, the roof is also highly susceptible to rotting, leaks, and far worse. When your roof is damaged, you usually have to fix it immediately because it can make your home uninhabitable, especially if it happens during the winter or rainy season.

Spot leaks and lost shingles are easily fixable for a few hundred dollars, but when the damage is dangerous or too extensive, you may be forced to replace the roof completely. This can cost thousands of dollars. The best way to avoid having to replace your entire roof is by carrying out preventative maintenance and having it inspected by a professional at least once annually.

2 – Water Heater Repair

A water heater is something that homeowners use on a daily basis without really giving much thought to it. Most people never really think about their water heater until it needs to be fixed. On average, a water heater should serve you well for 5-10 years, but unforeseen events like mineral build up or overuse can damage your water heater any time.

When your water heater is damaged, you will not get to take that hot shower you usually look forward to after a busy day, and it can also cause flooding if you fail to deal with it promptly. Signs of water heater damage include leaks, unusual or loud noises, and – of course – if it does not do its job. Although you can definitely repair a busted water heater, it might be better to bring in an expert you trust to take a look at it. He or she can let you know whether it's time for a new one or if a repair will suffice.

3 – Foundation Repair

If your house is built in an area where the soil contracts during the dry season and swells during the rainy season, your foundation could be at risk. Water is a foundation killer; it seeps through concrete, sprouts mould, settles in basements, and empties wallets. Water can cause your foundation walls to crack or settle wreaking havoc throughout the exterior of your home. When your foundation is compromised, you may see random cracks on your floor and walls, sloping floors, water pools in the basement and edges of the house, or difficulties

closing doors and windows. Foundation damage is extremely serious, and it can cost you tens of thousands of dollars to fix.

4 – Siding Repair

Your siding is also a vital part of your house. Think of it as the skin of your home, protecting it from external threats while giving it an aesthetic appeal. If your house is fully or partially covered in aluminium, vinyl, or wooden siding, water can sneak past damaged parts, leading to insect invasions, rot, and interior damage. Repairing individual sidings is cheap and easy, but when you need to replace the entire square footage, you will have to write a fat check to a siding repair expert.

To prevent these costly repairs, inspect your entire house for any holes or cracks in the siding as well as damaged or missing caulking around doors and windows. If you catch the problems early enough, you can save thousands in costlier repairs were the damage to spread.

5 – HVAC System Repair

Your heating, ventilation, and air conditioning system (HVAC) allows you to control the internal environment of your home, making it more comfortable. Without proper maintenance, your HVAC system may get damaged, requiring expensive repairs or even a replacement. The worst thing about HVAC systems is that they tend to break down at the time that you need them most, such as the winter and summer months when they are working the hardest.

When there is a problem, your HVAC system could make strange noises or fail to cool or heat the house when you need it to. To avoid this, you should carry out regular maintenance on your unit. Every six months be sure to inspect it, tighten electrical connections, lubricate moving parts, clear out the condensate drain, check the refrigerant level, and clean dirty coils or fixtures.

6 – Sewer Line Repair

If your home is connected to the public sewer line, you usually have a sewer line connecting your home to the public sewage systems. No homeowner ever wants to see their sewer line face to face. It looks terrible and can spread terrible odours to the entire neighbourhood.

Remember, your town's liability for the sewage system ends at the street. That means the homeowner is responsible for the sewer line underneath his or her property. The cost of repairing a broken sewer line may not be expensive, but cleaning up the mess can be costly and disgusting. Depending on the severity of the issue, you may need to check into a hotel or move in with a close friend for a couple of days.

7 – Water Line Repair

The water line connects your home to the public water system. If you solely depend on your local government to supply water to your home, your water line is not something you ever want to be damaged since it can cut off the water supply to your entire home. When the main water line is damaged, it creates a huge underground flood that can seep up to your lawn and create huge puddles.

First and foremost, I do not recommend trying to fix this on your own. To repair a leak like this, crews will have to get to the water line to identify the source of your leak. They will need to go through your lawn, driveway, tree roots, and other areas of your landscaping.



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Home Science



Notes

After paying to have your water line fixed, you will also need to pay someone to restore your landscaping to its original form (unless you have a green thumb and do it yourself).

8 – Deck Repair

A wooden deck provides the perfect spot to enjoy a summer cookout with friends or family and also adds value to your home. However, if you fall behind the recommended maintenance schedule, your deck could fall apart due to rot, insects, or flooding. It could cost you thousands of dollars to replace your entire deck. To avoid this, you should always keep your deck clean and apply the recommended products to enhance its longevity. Sealant will keep moisture out and wood stain will refresh its colour. Also, a regular inspection will help you detect rot or insect invasion and stop it before the issue becomes a full-blown problem.

9 – Septic System Repair

If your home is not connected to a public sewage system, you need a septic tank to sort out your house waste. A septic tank works just like a sewage treatment facility, separating the fats and solids from household waste and using beneficial bacteria to treat the leftover liquid. Septic systems require special care and maintenance that many people take for granted. For instance, flushing the wrong chemicals down a drain or failing to pump out the tank can result in a system-wide failure.

A damaged septic tank can be a messy problem that you do not want to put off fixing. Your drains will be slow, your toilets may not flush, and you may have to deal with terrible odours. The cost of installing a new septic tank could be thousands of dollars, so you want to avoid it for as long as possible through regular preventive maintenance and inspections.

10 – Pipe Repair

Water pipes run through your foundation and walls, delivering water to the bathrooms, kitchen, laundry room, and anywhere else that you need it. When pipes are broken, it can take anywhere from minutes to months to notice the damage. If it is a small leak, it can be hard to notice even though it will be silently causing a lot of damage to your home. When you suspect your pipes are broken or when you detect it after an inspection, the first thing you should do is to turn off the main water valve to prevent further damage. Fixing a broken pipe is something that you can do on your own and is usually not that expensive. However, if you need to go through the walls or the foundation, you might want to hire a plumber to deal with it.

11 – Electrical System Repair

Electrical faults can happen at any time, rendering your entire home or parts of your home powerless. When your electrical system is damaged, you may notice flickering lights, circuit breakers tripping too often, and appliances shocking you or going off unexpectedly. If your neighbours have power and you do not, your electrical system could be damaged. If you do not fix it promptly, your home is at risk of a fire, prolonged power outage, and you could even be putting your life at risk. It is not safe or easy for the average homeowner to conduct electrical repairs, so unless you really know what you are doing, have a professional electrician take care of it.

12 – Mold Damage Repair



Mold is a common problem that usually starts off small, but it can grow into a huge problem if you let it. Mold is usually caused by moisture typically from leaks, but not necessarily. It may affect the walls, ceiling, roof, or foundation – messing with the structural integrity of your home. On top of that, mold can cause a variety of health issues to your family, especially if someone is allergic. When your home has mold damage, you will detect a musty odour, discoloration in walls or ceilings, and allergy symptoms. Early detection through regular inspection is the best way to deal with mold damage.

13 – Driveway Repair

Asphalt driveways have to withstand the weight of vehicles and constantly-changing weather patterns. This can lead to cracking or crumbling of your driveway, forcing you to repair it or replace it entirely. To preserve your asphalt driveway, I recommend using a driveway sealer to protect it against the elements.

14 – Floor Repair

Your floor can get damaged after many years of wear and tear or if you accidentally drop a heavy object on it (in the case of wood flooring or tile). Cracks in your flooring or loose tiles are two signs that your floor probably needs repair or replacement. Also, a wood floor may be squeaky when you walk on it when it is damaged.

our floor can get damaged after many years of wear and tear or if you accidentally drop a heavy object on it (in the case of wood flooring or tile). Cracks in your flooring or loose tiles are two signs that your floor probably needs repair or replacement. Also, a wood floor may be squeaky when you walk on it when it is damaged.

Floor repair can be cheap if it involves replacing a few tiles or filling in some cracks, but when you have to replace the entire floor, it will be expensive. If this happens, I would definitely upgrade your floor not only to current standards, but also with a material that will add value to your property and help increase its resale value.



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29 AESTHETICS AT HOME

Introduction

Cleaning also involves putting the things in place. For this, a specific place is decided for every household item. What happens if such type of cleaning is not done on a regular basis? Yes, you can never find things on time. You waste time trying to find them. When in a hurry, you may topple half the things and leave a mess behind. More things get misplaced, more time wasted and this cycle goes on.... You will find yourself always running short of time, unorganized and unsystematic.

On the other hand, if all the things are kept clean and are in their proper place, you will have no such problems and meanwhile you will also save a lot of time and energy. Imagine yourself living in a house which is cluttered with furniture and paintings, and curtains that are not matching. There are too many decorations in the showcases. There is hardly any space to move about, as a result your movements are restricted. I am sure you would not like to live in such a house. On the other hand, picture yourself in a home in which the furniture is proportionate to the size of the room.

Other objects are well arranged; curtains give uniformity to the room; colours create an informal atmosphere and are pleasing to the eye; the lighting is adequate and there is enough space for free movement. Living in such houses is a pleasure.

In all, you feel rested and comfortable. Thus, we see that if the rooms are arranged beautifully and at the same time, satisfy our needs of work, we can derive optimum satisfaction from them. One has to provide an artistic touch to make the same things look beautiful as well as comfortable. So, you see, if you have good taste and understand art, you can decorate any room in a desirable and pleasant way.

Flower decoration

You must have seen flowers decorated in the halls of marriage parties or hotels. Don't you think they look beautiful? You too, can make flower decorations with whatever locally available materials you have. Whether it is an informal party, a formal dinner, an office, a conference room, a living room, a bedroom etc., all will call for different kinds of flower arrangements. Thus, the purpose of composing an arrangement and the atmosphere of the surrounding should always be kept in mind. For this, it is important to know various aspects of flower arrangements.

1. Collection of materials

First you need to collect materials such as flower vase, pin holder or oasis, fresh or artificial flowers, green leaves, twigs etc.

- i. Vases come in different materials and colours. You can also make your own vase with a flat pot, hollow of a wood etc. Vases should be chosen so as to match the surrounding



décor and mood. For a living room having cane furniture and coir coverings, a small basket as a vase will be more suitable than a porcelain one. A contrasting vase or one matching the flowers creates harmony in a flower arrangement.

- ii. Normally odd numbers of flowers are used in any arrangement. You can use as less as three flowers (as in case of ikebana- a Japanese art of flower arrangement). You should choose flowers of varying sizes.
- iii. You can also use natural looking, artificial flowers with fresh leaves to give a natural look. Use of fresh green leaves besides adding beauty and giving background to the flowers, can help the arrangement to resemble nature.
- iv. Pin holders are iron nails fitted on to a heavy metal base. These should be closely spaced, rust free and should be long enough to hold stems of flowers and leaves.
- v. Alternatively, a device known as oasis is also available in the market. This can absorb a lot of water and keep flowers moist. These should be soaked in the water until the air bubbles disappear and water enters right up to its core. These can be reused 2-4 times. Oasis is easier to handle for beginners who may find it difficult to balance flowers in pin holders.
- vi. Twigs help to enhance and give a natural look to the arrangement. These twigs can be collected from curved branches, roots, etc.
- vii. Leaves are used to fill up space between flowers and should be washed if dirty. Trim off unwanted, wilted and brown leaves. Some foliage can be used instead of flowers.

2. Method of flower arrangement

To arrange the flowers, one needs a lot of imagination. Observing nature and copying it can be a good start for beginners. Follow these tips for help.

- i. Fix pin holder to the container and pour water into the container until it covers the pin holder. Alternatively, soak the foam/oasis in water till it is saturated and then place it in the vase.
- ii. Decide the shape of flower arrangement. It can be a triangle, right angle, oval, S shaped etc.
- iii. Choose five flowers of different sizes in one colour. You can also experiment with contrasting flowers or with flowers which complement each other.
- iv. Pluck flowers early in the morning, before they mature. All cutting and nipping should be done under water.
- v. Cut the stems of flowers at different lengths. The tallest branch should be cut to the length which is at least $1\frac{1}{2}$ times the width of the vase.
 - i. First arrange the tallest flowers and then other flowers in order of their height.
 - ii. Place the second branch cut little shorter, away from the first one and so on.
 - iii. You should always push the branch firmly inside a pin holder or an oasis so that it stays in place and does not fall down.
 - iv. Add the flowers at different heights, ensuring enough space in between.
 - v. Face the flowers towards yourself so that you can enjoy their beauty.
 - vi. Put bigger flowers towards the bottom, medium sized in the center and buds at the top of the arrangement, so that it does not look top heavy.
 - vii. Fill the gaps with appropriate leaves of different sizes.



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viii. Hide the pin holder/oasis with leaves, stones etc.

ix. Place the arrangement against a contrasting background from where all the flowers can be viewed.

Principles of flower arrangement

While arranging flowers, you have to follow some basic principles.

- i. The size of the flower arrangement should be proportionate to the room or other articles in the room like the table on which it is kept, other decorative articles in the room etc. The plant material should be proportionate to the size of the container. You have already learnt that a large flower would look odd in a small vase and vice versa. The flower material should be 1 ½ times higher than the height of the flower vase.
- ii. The whole arrangement should be balanced. It should neither be top heavy nor lopsided.
- iii. Your eyes should be able to travel easily round the whole design and should not stop moving. For this, the basic shape, colour, texture should be repeated at intervals. For example, if curved plant material is used then combine it with a curved container. This can also be achieved if you arrange flowers at different heights.
- iv. Flowers of different sizes should be placed gradually from fully bloomed to buds. v) Keep the stem ends close together. This would give the arrangement a natural look.
- vi. The plant material should look more important than the vase. All parts of flowers should not attract equal attention. Larger, bright flowers always attract the eye, so too many different coloured flowers should not be put in the same arrangement. Instead, some small and dull colour flowers can be put along with brightly coloured flowers.
- vii. To emphasize the shape of twigs, flowers should either be placed higher or lower than the curves of twigs. Allow space around each flower.
- viii. The flowers, leaves and vases should harmonize and complement each other.

Floor decorations

In earlier days, people used to decorate floors by making different designs with the help of various colours and flower petals. They also used powders like rice or maida. This traditional method of decoration is still prevalent and is known as 'Alpana' or 'Rangoli'. You must have seen at your home also, women make drawings of animals and other shapes, on festive occasions. Rangolis are generally made on the doorsteps, courtyard or verandah of the house. You can also design a rangoli pattern and draw it on the floor with the help of a chalk. Then you can fill it up with petals, dry powdered colour, etc. Outlines can also be drawn by using flour or rice paste.

There are certain points you should keep in mind while making rangoli / alpana.

- (i) Select design according to the theme of the festival/occasion.
- (ii) Draw the design in double lines so that colour/material can be filled in-between. Ensure uniformity and balance.
- (iii) Use contrasting colours next to each other.
- (iv) While filling, use a scale to neaten the outlines.
- (v) Fill evenly, press flat to smoothen the material.
- (vi) Fill the background, so that the design looks part of the floor. You can use sawdust for filling

rangoli designs. To colour these, take about 30 gm (2 Tb spoon) dyeing colour in 1/2 glass water. Sieve sawdust and remove all wooden particles. Put the sawdust in a plastic tub. Add colour and mix well. Dry this on a newspaper in shade. Store in plastic bags.

Arranging accessories

You might have collected beautiful paintings, wall hangings, table lamps, cushions, and curios. Though each one may be very artistic, if they are not arranged thoughtfully, your house might end up looking cluttered and untidy. While arranging accessories you need to keep the following points in mind.

- (i) Hang paintings according to their size and space available i.e., big paintings on a big wall and vice versa. Alternatively, a group of small paintings can also be hung together. These can be hung in such a way that they all fit in an imaginary square or a rectangle.
- (ii) Paintings can be enhanced by putting spot lights which fall directly on the paintings.
- (iii) Hang all paintings straight and even, not lopsided.
- (iv) Colour of lamps should harmonize with the décor. These can be placed in corners or hung over a painting to enhance it.
- (v) Cushions can be placed randomly to add colour to the room.
- (vi) Care should be taken that too many curios are not collected together.
- (vii) Similar material curios (like all made of brass, cut glass, white metal, wood, etc) can be grouped and kept together.

SUMMARY

Housekeeping may be defined as 'provision of a clean, comfortable, safe and aesthetically appealing environment'. By another definition, 'housekeeping is an operational department in a hotel, which is responsible for cleanliness, maintenance, aesthetic upkeep of rooms, public areas, back areas and the surroundings. The term Housekeeping outside the hospitality, hospitals refers to the management of daily duties and chores involved in the running of a household, such as cleaning, cooking, home maintenance, shopping, and bill payment etc. These daily recurring tasks may be performed by any members of the household, or by other persons like butler or maids who are hired for the purpose. Housekeeping department in hotel ensures the cleanliness, maintenance, and aesthetic appeal of all rooms and public areas. The housekeeping department not only turnarounds (prepares and cleans guestrooms) on a timely manner it also cleans and maintains everything in the hotel so that the property is as fresh and attractive similar to the day when it opened the doors for the business. Cleaning also involves putting the things in place. For this, a specific place is decided for every household item. What happens if such type of cleaning is not done on a regular basis? Yes, you can never find things on time. You waste time trying to find them. When in a hurry, you may topple half the things and leave a mess behind. More things get misplaced, more time wasted and this cycle goes on.... You will find yourself always running short of time, unorganized and unsystematic. On the other hand, if all the things are kept clean and are in their proper place, you will have no such problems and meanwhile you will also save a lot of time and energy. Imagine yourself living in a house which is cluttered with furniture and paintings, and curtains that are not matching. There are too many decorations in the showcases. There is hardly any space to move about, as a result your movements are restricted. I am sure you



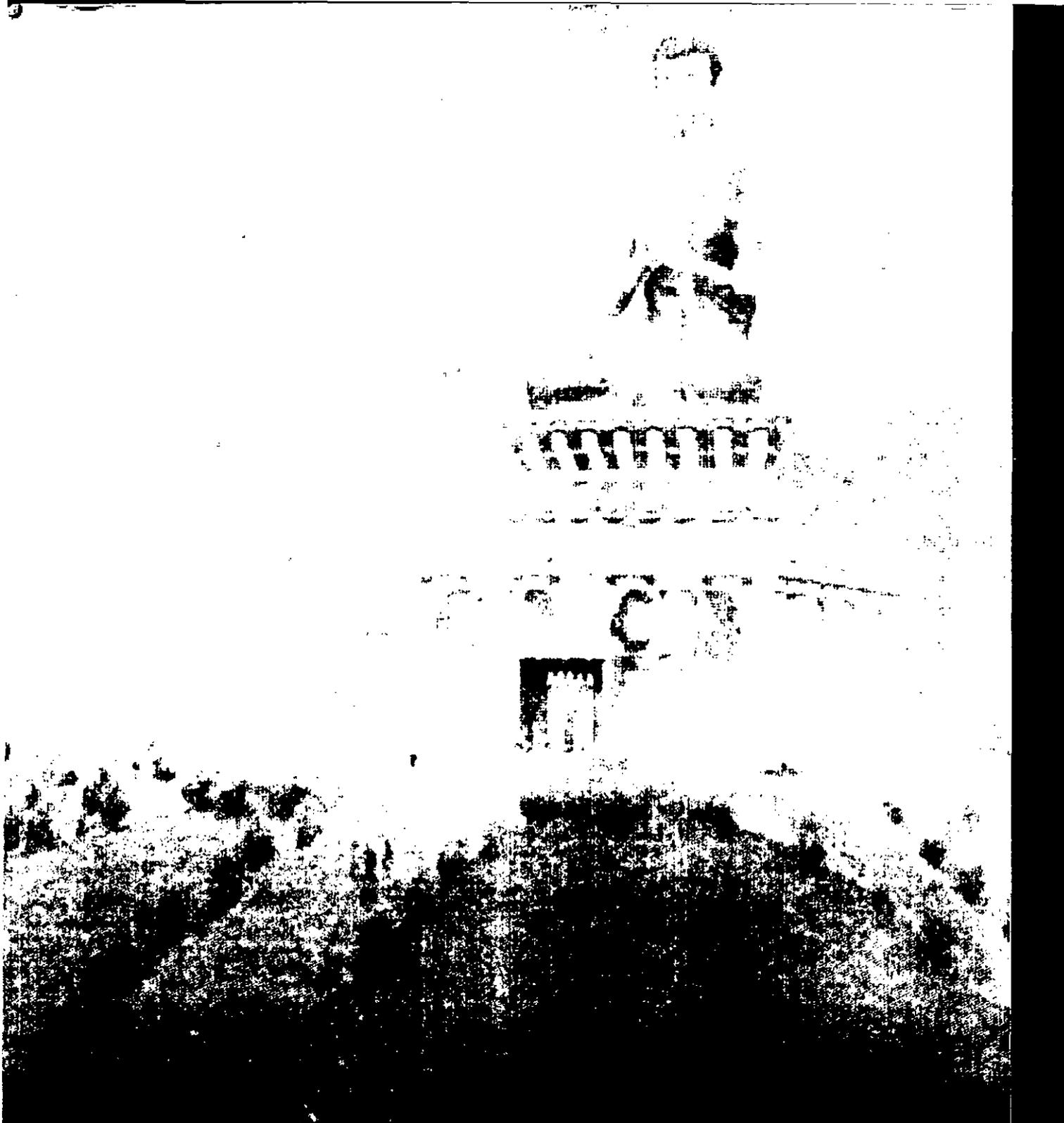


would not like to live in such a house. On the other hand, picture yourself in a home in which the furniture is proportionate to the size of the room.

EXERCISE

Review Questions

1. What is the concept of housekeeping?
2. Explain the importance of housekeeping?
3. Discuss the areas of housekeeping?
4. Explain the methods of cleaning in detail?
5. Discuss the types of cleaning?
6. Write a short note on floor and wall decoration?
7. Discuss the process of flower arrangements?
8. Explain the functions of housekeeper?



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