ORDINARY LEVEL

HOME SCIENCE

for Rwandan Schools

Learner's Book 1

TABLE OF CONTENTS

Unit 1

PERSONAL HEALTH AND ETIQUETTES

By the end of this unit, I should be able to:

- apply principles of good personal health and etiquettes in our daily lives.
- practice acceptable social behaviours.

Key unit competence: Learners should be able to state, apply and implement the principles of personal health and etiquettes in their daily life.

1.1. INTRODUCTION

In this unit, we are going to look at aspects and principles of maintaining good personal health, importance of maintaining good personal hygiene, indices of good health as well as personal and professional etiquettes which include: communication and language, values and eating habits.

1.2. PERSONAL HYGIENE

Learner's activity 1.1

1. Demonstrate how the following can be used to ensure good personal health.

Toothbrushes	Bathing sponge
	
Soap	**Razor blade**
	

Table number 1.1

2. Study the table below and identify the different ways of maintaining good health.

Ways of maintaining good personal health	What practice is shown in the picture?	Importance of such a practice
1 		
2 		
3 		

Table number 1.2

Personal hygiene: This is the habitual practice of keeping one's body clean including things we use, for example, clothing, shoes, toothbrushes, combs and so on.

Do you know that when we regularly and thoroughly wash our bodies, hair, hands, as well as brushing teeth,care for gums and keeping the feet and clothes clean, is of great importance? The following are the reasons for doing all that.

1.3. WAYS OF MAINTAINING GOOD PERSONAL HEALTH

Learner's activity 1.2

It is important to maintain good personal health. In groups of not less than five, identify the different ways how you as students can maintain good personal health.

After looking at the ways of maintaining good personal health, let us form groups of five and discuss the importance of maintaining good personal health.

From our findings, we shall note the following points as shown in the illustration below.

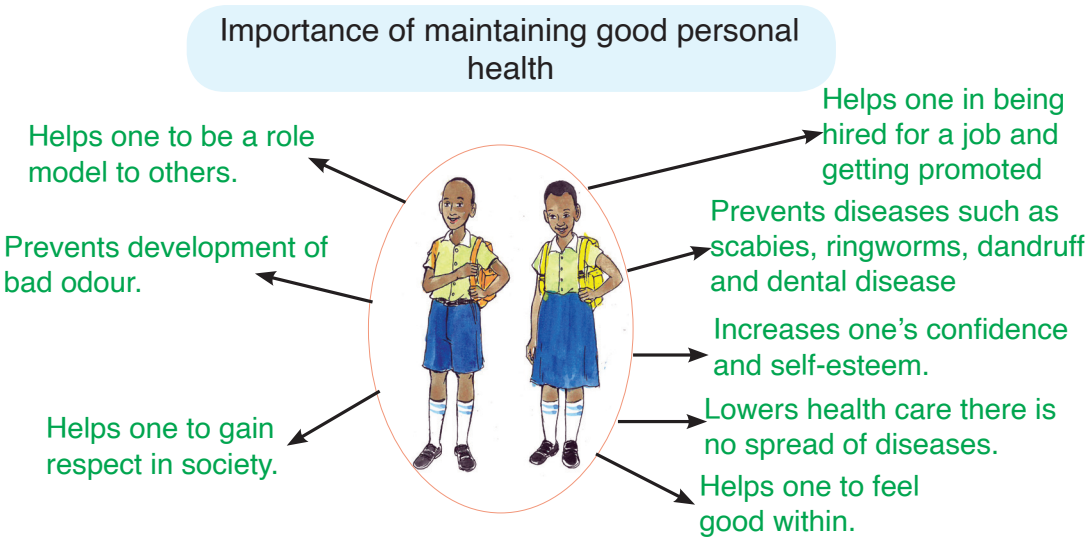


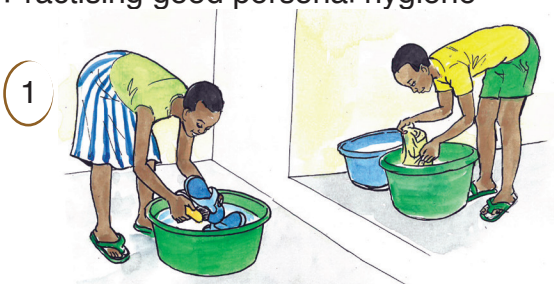
Figure 1.1: Importance of maintaining good personal health

Indices of good health

Learner's activity 1.3

It is important to maintain good personal health. In groups of not less than five, discuss the importance of maintaining good personal health.

The table below shows indices of good health. Study it and explain how each indice is important to your body.

Indices of good health	Importance
Practising good personal hygiene 1 	

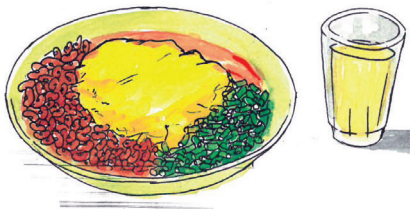
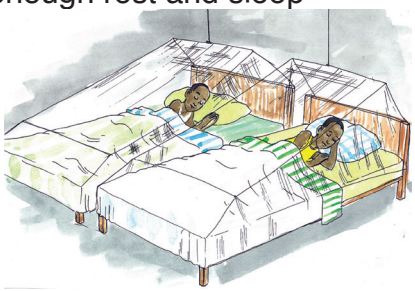
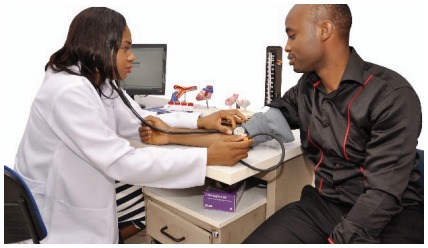
Eating a well-balanced diet 2 	
Having enough rest and sleep 3 	
Doing regular physical exercise 4 	
Having regular medical checkups 5 	
Having enough fresh air and sunshine 6 	

Table number 1.3

Good health is a state of complete physical, mental and social well being characterised with freedom from disease.

When you are feeling good about your self that is happy, lively and not having any pain. It means you are in a state of good health.

Therefore, good health is not merely the absence of diseases but a state of being well, mentally, physically, socially, emotionally and spiritually.

In addition to the above, other indices of good health include:

- clear, bright skin and eyes.

Figure 1.2: Children with bright eyes and skin

- Strong teeth, gums, nails and hair.

Figure 1.3: Children with strong teeth and gums

- Fresh breath and body odour.
- Meals being digested with ease that is; no gas, bloating, heartburn and so on.
- Feeling energised when you wake up with good energy level throughout the day.

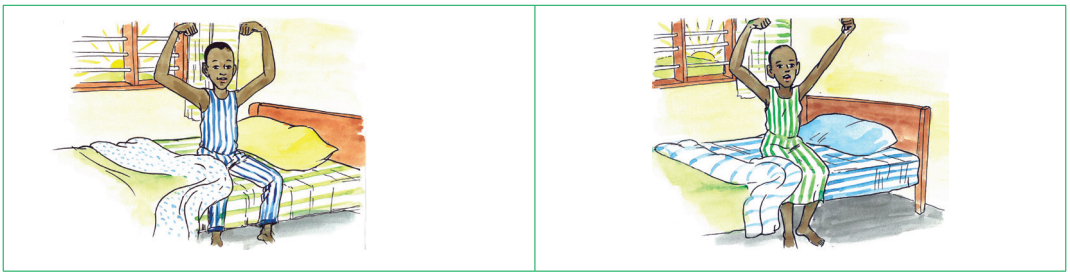


Figure 1.4: Waking up when energised

- Regular and healthy bowel movements.

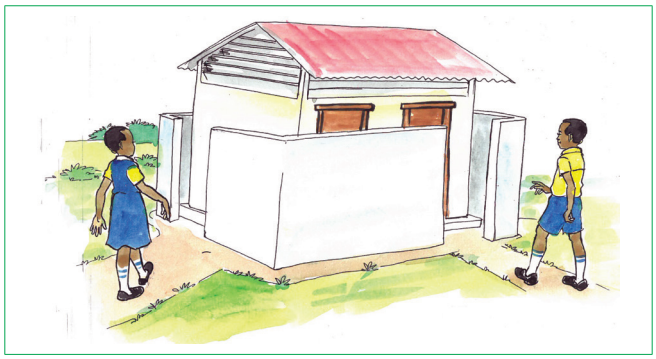


Figure 1.5: Regular bowel movements

- Clear urination.
- Wounds and bruises healing quickly.
- Joints and muscles flexing with ease.

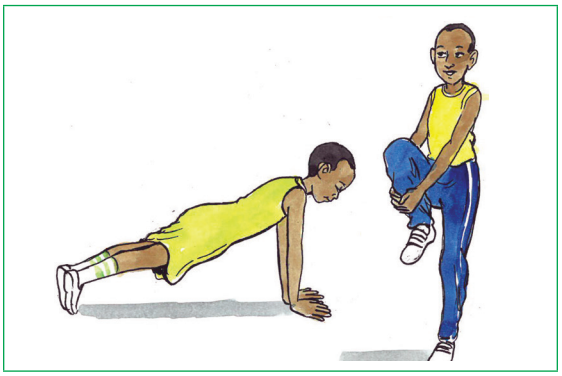


Figure 1.6: Joints and muscles flex with ease

- Consistent temperature.

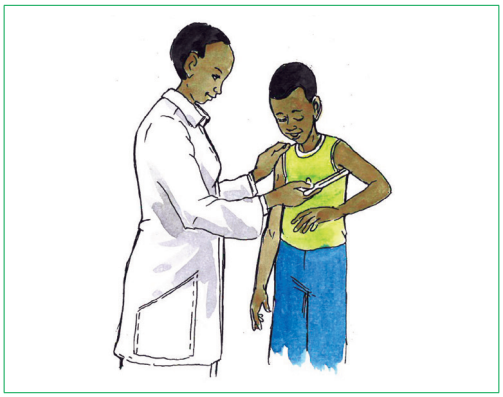


Figure 1.7: Having consistent temperature

- Being free from cravings for certain types of food and drink.
- Being able to maintain a suitable weight for your height and body.

Figure 1.8: Taking weight measurements

- Being rarely affected by colds, flu and other infections.
- Clear and focused thinking, good memory and concentration
- Even and balanced temper
- Being able to tolerate stress well

Physical exercise

Learner's activity 1.4

In pairs:

1. List some of the physical exercises you know.
2. Brainstorm the benefits of doing regular physical exercise.
3. Go outside the class and practice the following physical exercises.

Figure 1.9: Dancing

Figure 1.10: Jogging

Figure 1.11: Running

Figure 1.12: Walking

Figure 1.13: Playing soccer

Figure 1.14: Jumping

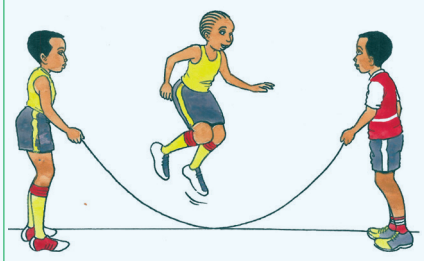


Figure 1.15: Skipping

Figure 1.16: Stretching

Figure 1.17: Squatting

We have all involved ourselves in activities that make our bodies sweat, increase the heartbeat and so on. This can be in form of walking, running, dancing, skipping, jumping and other activities. All these are forms of physical exercise.

We can therefore say that, physical exercises are important in the following ways.

- Physical exercise helps to increase the circulation of blood.
- It also makes the body to function better.
- It helps to strengthen the body muscles.
- It keeps the body physically fit.
- It controls on the body weight gain.
- It helps one to relax and sleep better.
- It reduces stress and tension.

We should also note that exercises should be done under fresh air and sunshine. We as young people should have exercises in form of swimming, running, tennis, soccer, dancing, and gymnastics while older people can walk for some distance at regular times of the day.

Sleep

Every individual has slept either knowingly or unknowingly. Think of those moments when reading a piece of material and you find yourself sleeping and wake-up the following morning. When this happens, it helps in the following ways.

- It restores the lost energy particularly to the nervous system since much energy is lost during work.
- It helps the brain to relax and recharge for more activities.
- It also helps one to have proper digestion and utilisation of food.

Figure 1.18: Child sleeping

Periodic medical check up

Learner's activity 1.5

In groups of five, answer the following questions and let the group leaders share their answers with the whole class. Your teacher will moderate your contributions.

1 . When was the last time you did medical checkup?

2. How often do you take medical checkup in a year?

3. Do you do medical checkups regularly or when you are sick?

4. Give reasons for doing periodic medical checkups.

5. Identify the different activities that happen when you go for medical check up.

After answering our questions in the activity above, we shall note that regular or periodic visits to a doctor help to cure certain illnesses and prevent certain diseases such as cancer, tooth decay, epilepsy, high blood pressure, and diabetes which may develop without our notice.

Eating a balanced diet

Learner's activity 1.6

In pairs, answer the following questions and thereafter share your experiences.

1. Mention the food you commonly eat at home.

2. Do you think everytime you eat you have a balanced diet or not?

3. How many meals do you have in a day?

4. Give the importance of eating a balanced diet.

We shall also find out that eating a balanced diet is one of the ways of maintaining good personal health. From our findings, we shall note the advantages of eating a balanced diet as shown in the illustration on page 8.

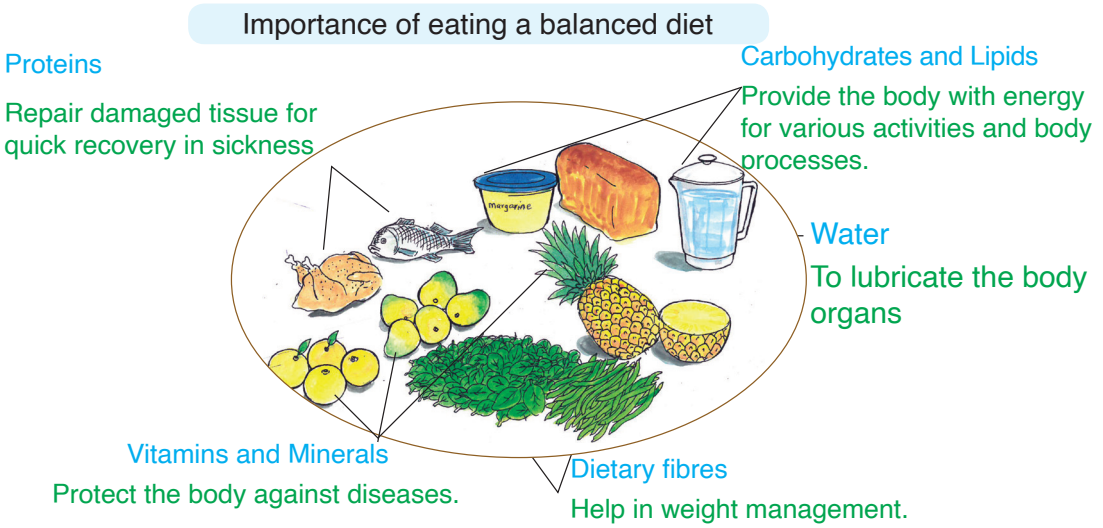


Figure 1.19: Foods containing the balanced diet

Considering the numerous advantages of eating a balanced diet, we can note that a balanced diet is a diet containing carbohydrates, proteins, fats, vitamins, minerals and fibre in the right amount and proportion to keep an individual healthy.

Revision questions

1. Define the following;
   i. Personal hygiene ii. Good personal health
2. Discuss the importance of maintaining good personal hygiene.
3. Outline the indices of good health.
4. Give the importance of sleep in a person's life.
5. What are the benefits of doing periodic medical check-ups to an individual?
6. Plan a meal that provides all nutrients for yourself.

1.4. PERSONAL AND PROFESSIONAL ETIQUETTES

Learner's activity 1.7

- In groups of 10, research on personal and professional etiquettes and make a class presentation.
- The teacher will moderate learner's contributions.

In our communities, we are all expected to behave in a certain manner or way.

Different societies have different set rules that are followed. The acceptable rules or habits governing behaviour regarded as correct or acceptable in social or official life are what we refer to as **Etiquette**.

They can also be defined as a standard and code of practice followed by members of any profession or group.

Let us study the table below and identify acceptable and unacceptable behaviour in society and give reasons why it is acceptable or unacceptable.

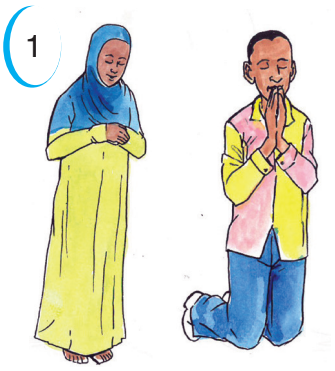
Identify whether the behaviour is acceptable or not			
Image	**Acceptable**	**Not acceptable**	**Why**
1 			
2 			

Table number 1.4

After research and discussion, identify the different personal and professional etiquettes.

The table above shows different personal and professional etiquettes and how best they can be presented and achieved.

Communication and language

Learner's activity 1.8

Form groups of 10 and role play the different communication and language etiquettes.

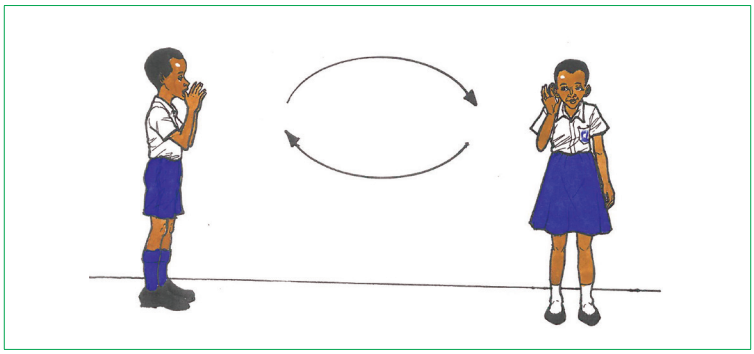


Figure 1.20: Communication

Communication is the importing or exchanging of information or news.

Language is a method of human communication either spoken or written, consisting of the use of words.

Communication is transmitted by body language through; use of eye contact, gestures, facial expressions

Communication can also be expressed in the voice that is: it's quality, use of tone, articulation

It can also be conveyed in the words we use.

To be good at communication, you:

- Need to mind about your body language and its meaning.
- Need to use expressive, gestures which are neutral at the same time.
- Need to produce a good resonant booming sound that can be heard by your audience.
- Should present a clear speech so that you are understood.
- Need variation in pitch and pace of the presentation.
- Need to use a good upright posture good eye contact, open body language and have a firm handshake.
- Need appropriate clothing, neat and clean hair, nails and shoes.
- Need a well-produced voice which amplifies confidence.

Values and Ethics

Learner's activity 1.9

Each and every student should investigate and share the values and ethics in their cultural society.

Values are important long lasting beliefs or ideas about what is important to a person of a culture society.

Ethics are referred to as a set of rules which are plainly adopted by a group of people.

To observe professional values and ethics, the following should be put into consideration;

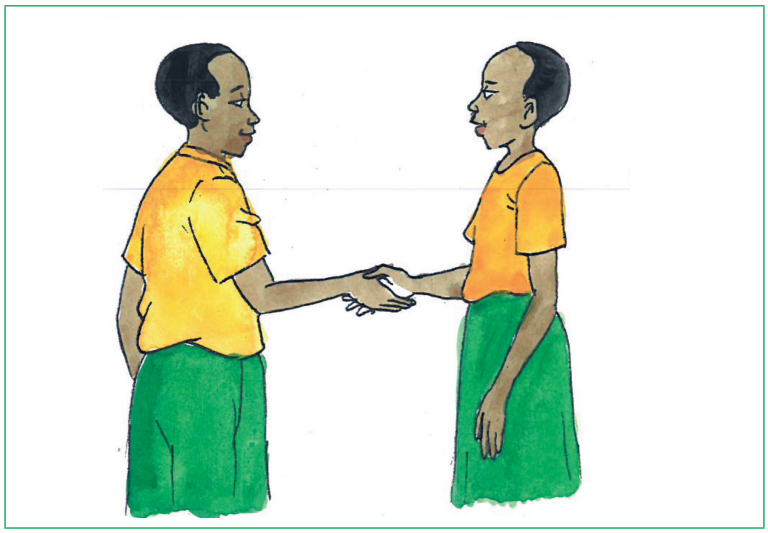


Figure 1.21: Shaking hands

- Being excellent: Excellence is a quality of service which is unusually good and so surpasses ordinary standards, it should be made a habit for it to make a good impression on your bosses and colleagues.
- Being trustworthy: Trustworthiness is being dependable, and reliable when called upon to deliver a service.
- Being accountable: This is taking responsibility for your actions and its consequences whether good or bad.
- Being courteous and respectful: Courteousness is being friendly, polite and considerate in manners towards others.
- Being honest, open and transparent: Honesty is an aspect of moral character that means positive and good attributes such as truthfulness, straightforwardness of conduct, loyalty, fairness, sincerity, openness in communication and generally operating in a way for others to see what actions are being performed.
- Being competent and improving continually: Competence is the ability of an individual to do a job properly.
- Always be honorable and act with integrity; honorable action is behaving in a way that portrays goodness of soul.
- Being respectful of confidentiality: Confidentiality is respecting the set of rules that restricts you from unauthorised distribution of information.

- Setting good examples: One must show and lead by good example. This is about living an exemplary life within so that others can learn from you.
- Giving value in return to your business and customers.
- Treating others well and having concern for the well-being of others.
- Never to use foul language, insult or demean your colleagues.

Body language

Learner's activity 1.10

Demonstrate the different facial expressions used in communication.

Body language is a kind of non-verbal communication where thoughts, intentions or feelings are expressed by physical behaviour.

Body language can take form as:

- Facial expression
- Body posture
- Gestures
- Eye movement
- Touch
- Use of space

Body language to express different feelings

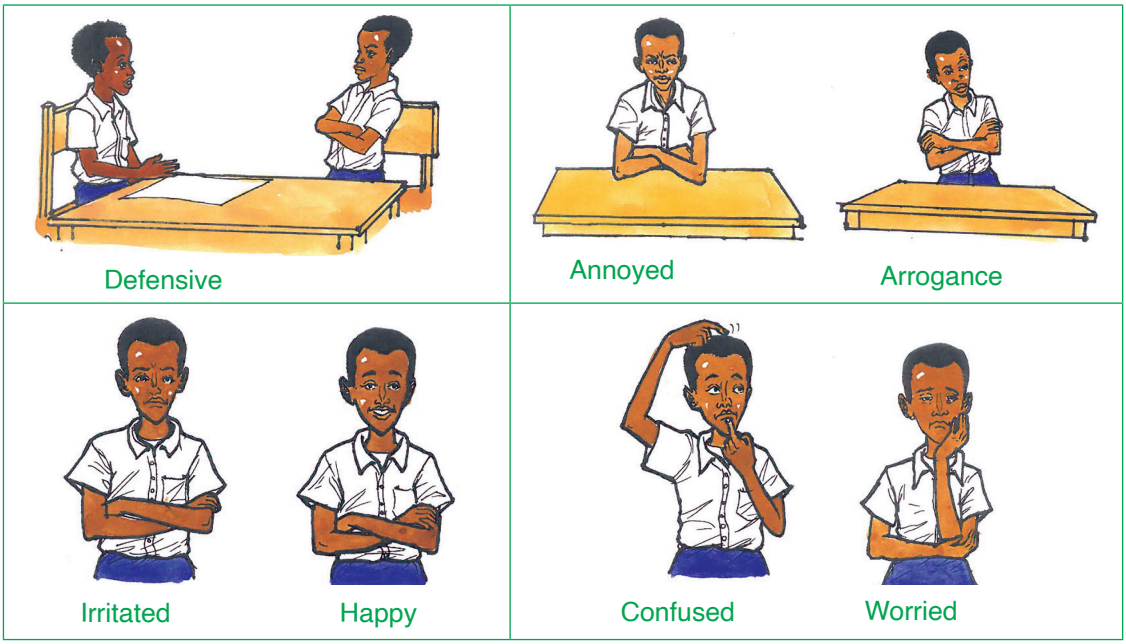


Figure 1.22: Body language to express different feelings

Facial expression

This is the presentation of the face when expressing emotions through the body. Happiness, sadness, fear, disgust, depressed, angry.

We shall note that the face conveys the immense richness of non-verbal communication than any other body part

Meaningful facial expressions involve:

- Maintaining eye contact while talking with others.
- Not studying hands or cleaning fingernails while others are talking.

Body posture

This is the way in which your body is positioned when you are sitting or standing.

Body posture displays one's emotions such as: anger, fear , nervousness, attentiveness.

Let us role play different postures in groups of five and the class will identify the meaning of different standing and sitting postures.

Gesture

Learner's activity 1.11

Demonstrate the different the gestures used in communication.

Gesture is defined as the movement of part of the body, especially the hands, arms, fingers, legs or the head to express an idea or meaning.

Handshakes

Learner's activity 1.12

Demonstrate the different handshakes used in communication.

A handshake is an act of shaking a person's hand with one's own, used as a greeting or to finalise an agreement.

Handshakes show a level of confidence and emotions in form of:

- Finger squeeze
- Bone crusher (shaking strongly).
- Limp fish (shaking weakly)

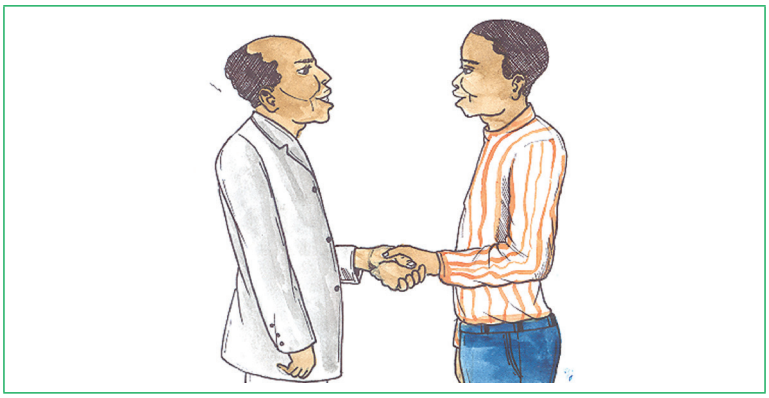


Figure 1.23: Handshake

In pairs, learners will demonstrate different handshakes and the rest of the class will identify the meaning of each type of handshake.

Other types of body movements

We shall also find out that there are other types of body movements, for example covering one's mouth suggests suppression of feelings and perhaps uncertainty. This could also mean that someone is thinking hard and may be unsure of what to say next.

Eating Habits

Learner's activity 1.13

Let us research and practice the things one needs to follow in order to develop healthy eating habits.

We shall research and present the definition of eating habits as the way a person or group eats, considered in terms of what types of food are eaten in what quantities and when.

Eating habits refers to why and how people eat which food they eat and with whom they eat as well as the way people obtain, store, use and dispose of food leftovers.

We shall note that there are factors which influence people's eating habits.

Including:

- Individual factors
- Social factors
- Religious factors
- Economic factors

- Environmental factors
- Political factors

Using our research findings and presentation, we shall realise that we need to do the following to achieve good eating habits.

- Scheduling three meals a day.
- Eating a healthy breakfast.
- Eating frequent and nutritious meals.
- Enjoying snacks in between meals.
- Drinking water or having soup before meals to reduce over-eating.
- Eating slowly and chewing the food thoroughly helps in digestion.
- Obtaining proteins from nuts, legumes, grains, sprouts and choose low fat dairy products, lean white meats or fish.
- Choosing a variety of whole grain produce to include millet, barley, sorghum, oats and wheat.
- Choosing organic products to eliminate chemical exposure.
- Avoiding processed food as sometime it's hard to digest.
- Choosing sea salt for cleaning purposes.
- Eliminating sugars or choosing unrefined sugar such as honey.
- Drinking a lot of water to wash out toxins.
- Gradually weaning from large portions to achieve a healthy weight.
- Eating less in the evening.
- Eating at least one nutritious meal per day with your family to encourage good eating habits.

Eating a balanced diet

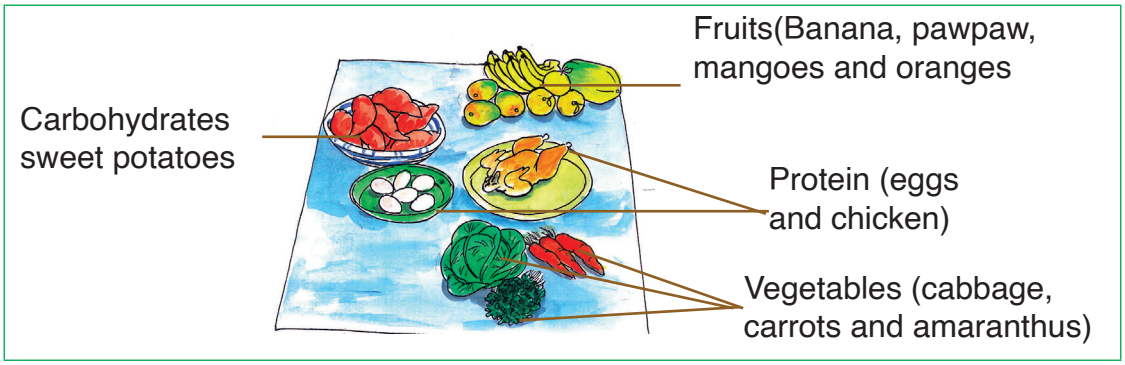


Figure 1.24: Balanced diet

Unit assessment

1. Investigate the meaning of the following words
   - i. Etiquette
   - ii. Communication
   - iii. Language
   - iv. Values
   - v. Ethics
   - vi. Body language
   - vii. Eating habits
2. Demonstrate the key points to put in mind in order to be a great communicator.
3. Investigate the professional ethics that a person working in a bank should have.
4. Which posture in a sitting position characterises a person with an open and relaxed mind?
5. What needs to be done in order to achieve healthy eating habits.

Relating this unit and other subjects

In this topic; home management and subtopic personal health, etiquettes and home care, there are many aspects looked at which are also studied in other subjects.

This unit is related to other subjects for example, the study of human body and personal hygiene is in biology, etiquettes, pronunciations and expressions are in languages then physical exercises in physical education and eating a balanced diet and eating habits are in food and nutrition.

UNIT SUMMARY

In this unit area, we have looked at the aspects and principles of maintaining good personal health, personal and professional etiquettes that is: Communication and Language, Values and Ethics, Body language and Eating habits. In the next subtopic area, we shall study types of colours, principles and use of colours and types of decorative materials, tools and equipment.

GLOSSARY

Body language: the process of communicating what you are feeling or thinking by the way you place and move your body rather than by words

Communication: the activity or process of expressing ideas and feeling of giving people information

Ethics: the moral principles that control or influence behaviour

Etiquettes: the formal rules of correct or polite behaviour in society or among members of a particular organisation

Habit: a thing that you do often and almost without thinking, especially something that is hard to stop doing

Health: the condition of a person's body or mind

Hygiene: the practice of keeping yourself and your living and working areas clean in order to prevent illness and diseases

Indices: signs or measures that something else can be judged by

Medical checkup: a thorough examination of your body that a doctor does

Physical exercise: is any body activity that enhances physical times and overall health and wellness

Sleep: the natural state of rest in which your eyes are closed, your body is not active and mind is not conscious

Values: beliefs about what is right and wrong and what is important in life

Unit 2

DECORATION COLOURS

In this unit, I should be able to:

- use different types of colours.
- apply principles of colour usage.
- apply different types of decorative materials, tools and equipments.

Key unit competency: To be able to match decorative colours on different backgrounds.

Interior decoration

Is the decoration of the interior of a room in a building especially with regard to colour combination and artistic effect.

2.1. INTRODUCTION

In this unit we shall look at the different types of colours, principles and use of colours as well as the different types of decorative materials, tools and equipment.

Learner's Activity 2.1

1. Using flowers and leaves of different colours, decorate a flower vase that can be used on a dinning table.
2. Using different fruits of various colours, prepare a centre piece that can be put on a dinning table.

2.2. TYPES OF COLOURS

In relation to our activity above, we can note that there are many types of colours. Most of them are known to us while others are not and it is hard to tell their names. Have you ever seen colours whose names you can tell?

Colour is meant for comfort and delight of the human heart and all colours depend upon light.

Learner's Activity 2.2

1. Shade the following circles using primary colours.

2. Shade the following stars using secondary colours.

What are the types of colours?

i) Primary colours

Primary colours are the ones that cannot be broken down into other colours and no combination of other colours can produce them. They include yellow, red and blue.

Figure 2.1: Primary colours

ii) Secondary colours

Secondary colours are made by mixing two primary colours i.e. Yellow and red produce orange, red and blue produce violet, blue and yellow produce green.

Figure 2.2: Secondary colours

2.3. PRINCIPLES AND USE OF COLOURS

Learner's Activity 2.3

Identify the different colours that are obtained by colour the following colours.

i. Red and orange ii. Yellow and red

iii. Blue and yellow iv. Violet and blue

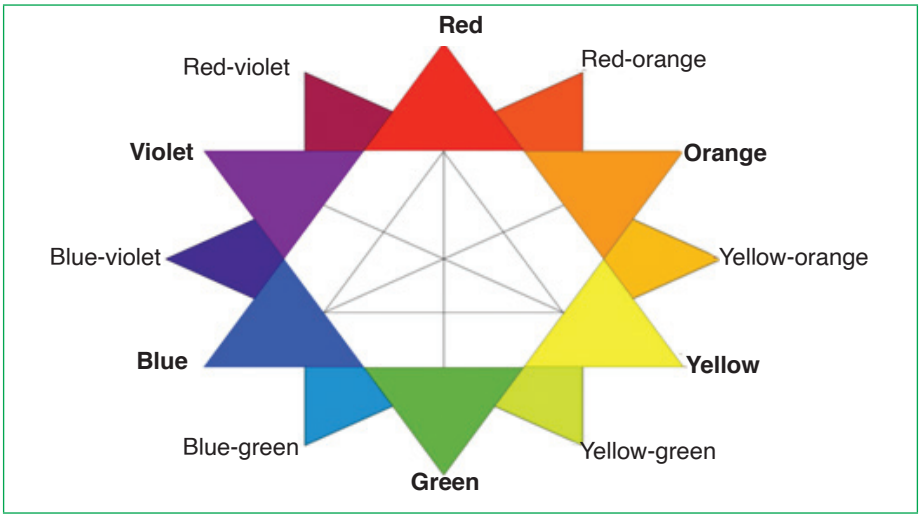


Figure 2.3: Colour wheel

(i) Mixing colours

Have you ever tried to mix colours at home? What is colours mixing? What does it produce?

Mixing different colours results into the production of a number of other colours. For example, two primary colours are mixed to produce secondary colours.

The colour wheel above is very important when mixing colours. It shows a set of matching colours, contrasting colours, complementary colours and so on.

Tints and shades

Learner's Activity 2.3

Starting with some paint in your favourite colour. It can be red, blue, green and so on. Mix it with different amounts of white to make tints and different amounts of black to make shades. Then try creating a picture or a design that uses all these tints and shades.

Colour mixing results in the making of tints and shades.

Tints: These are light values or colours that are made by mixing a colour with white. For example, pink is a tint of red, and light blue is a tint of blue.

Figure 2.4: Mixing red and white paint to form pink

Shades: These are dark values or colours that are made by mixing a colour with black. Maroon is a shade of red, and navy is a shade of blue.

Figure 2.5: Mixing red paint with black to form maroon

Figure 2.6: Mixing blue paint with black to form navy or dark blue

(ii) Warm colours and cool colours

Learner's Activity 2.4

Using warm and cool colours, decorate your classroom, then describe how you can use cool colours to decorate your living room at home.

a) Warm colours

What are warm colours?

They are also known as expanding or advancing colours and they are related to fire, sunshine or hotness. These colours are said to be exciting and stimulating.

Yellow is the warmest and brightest of the colours. Warm colours reach out or are referred to as active colours and they make an object appear larger, closer or nearer than it actually is.

Warm colours when used in a room for interior decoration they make it appear smaller and shorter than its actual size.

Figure 2.7: Warm colours

Figure 2.8: A well decorated bedroom using warm colours(yellow, red)

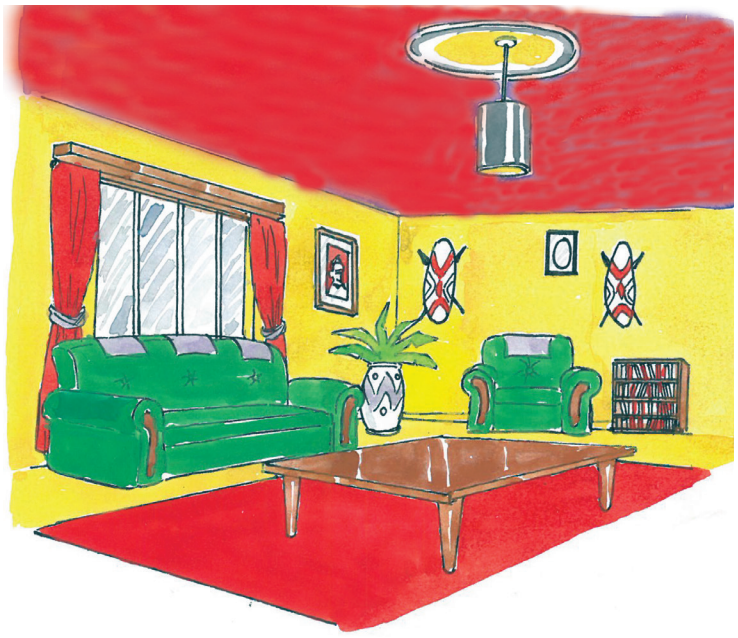


Figure 2.9: Sitting room decorated using warm colours

Exercise 2.1

1 . Explain how you can use warm colours to correct fault in the room as being too big or too small.

2. What is the effect of warm colours on a room and a person?

b) Cool colours

Learner's Activity 2.5

Go into the field and pick whatever colour you find, group them into bright and dull colours.

What are cool colours? What is their implication?

They tend to have an aspect of blue, related to the cool water and the sky. They also have aspect of green, related to the green grass. These colours give a feeling of calmness and restfulness. The objects in these colours appear smaller and further away than they actually are, hence are called **receding** or **passive colours**. Colours might make you think of cool and peaceful things, like winter skies and still ponds.

Figure 2.10: Cool colours

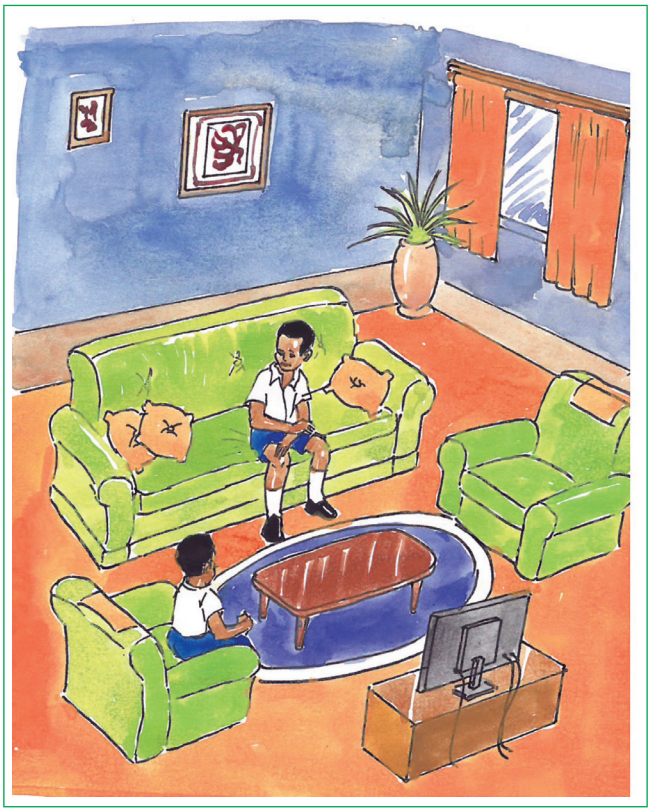


Figure 2.11: A sitting room decorated with blue, green & orange colour (cool colours)

- What is the effect of cool colours on a person and a room?
- How can you use cool colours to create beauty in a home?

(iii) Complimentary colours

These are colours that are opposite each other on the colour wheel such as blue and orange. A true spectrum, blue and orange though effective in advertising, aren't that good for a dress or room. However if the intensity and value of the orange is lowered and the intensity of the blue is softened, the harmony will be pleasing. For the walls, orange in slight value with medium rug and furnishings in blue of 2-3 different values results in a pleasant complementary harmony.

Examples of complimentary colours according to colour wheel on page 23 include blue and orange.

Figure 2.12: Complimentary colours

2.4. MEANING OF COLOUR DEPENDING ON OCCASION

We are all aware that colours have different meanings and this guides their use on different events. Just take a look at the colour of dresses or shirts you put on during different functions. Depending on culture, colours may mean the following:

(i) **White**: White represents purity, cleanliness, peace and knowledge. In Christianity, white symbolises, glory and the road to heaven. However, white can sometimes have a negative meaning as well. It can symbolize the pallor of death, it can be used as a colour of mourning.

Figure 2.13: White colour used in church to symbolise peace and glory

(ii) Red: Red can mean happiness, prosperity, fertility and strength in some cultures for example the Hindus. However, universally red is the most exciting colour and it is known to escalate body's metabolism. Dark red indicates anger, high energy, determination and passion. It is also a symbol of love, that is why it is always used on weddings and introduction ceremonies.

Figure 2.14: Red colour used in wedding ceremony to symbolise happiness and love

(iii) Black: Black represents ignorance or death. In Christianity, black stands for death, in art and in religion it signifies despair sin and mourning. Therefore, black is always worn on funeral ceremonies.

Figure 2.15: Black colour used on a funeral function

Learner's Activity 2.6

Identify complementary colours on the colour wheel on page 23.

Exercise 2.2

1 . Explain how complementary colours can be used to create beauty in:
   (i) a home
   (ii) dressing

2. Why is it important to choose the correct colours for the correct occasion?

Learner's Activity 2.7

1. Discuss the suitable cloth colour combinations for the following occasions.
   - Job interview
   - Family reunion
   - Birthdays
   - Weddings
   - Funeral
   - Christenings
   - Public speaking
2. Roses are nice looking flowers that are used on a number of occasions. In groups of not less than five, discuss why and what best colour of roses you may choose for the following occasions.
   - Wedding
   - Birthday
   - Mother's day
   - Thank you

2.5. DECORATIVE BACKGROUND

Learner's Activity 2.8

Discuss the different materials that can be used to bring about a decorated background.

This is any background surface that has been designed using artistic work, for example artistic craftmanship in an attempt to make it look nice or beautiful.

Walls may be decorated using coloured and well designed wallpapers, the floor can be covered using tiles and carpets that are attractively designed.

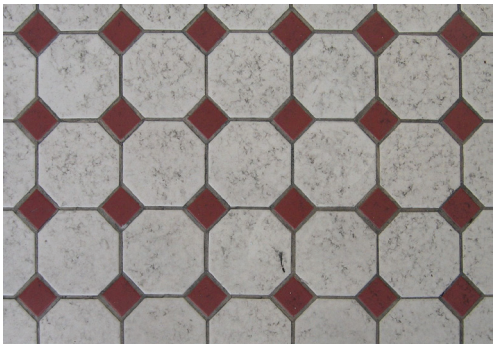


Figure 2.16: Tiles

Figure 2.17: Wall paper

Figure 2.18: A room background decorated with artistic materials of red, purple and yellow

2.6. TYPES OF DECORATIVE MATERIALS, TOOLS AND EQUIPMENT

Decorative materials

Learner's Activity 2.9

1. Identify the different natural and artificial decorative materials that are common in your society.
2. Discuss in class how these decorative materials are used.
3. Demonstrate how you can use natural decorative materials to create beauty.

Decorative materials are materials that are used to create beauty to an individual or in the home. These can be natural or artificial decorative materials.

What are decorative materials?

i. Artificial decorative materials

We should note that decorative materials include ornaments used to embellish parts of a building or objects. They can be carved from stones, wood or precious metals.

Figure 2.19: Decorative materials

Figure 2.20: Floors made of wood

ii. Natural decorative materials

Figure 2.21: Decorating using natural decorative materials

There are also natural decorative materials which are made from gifts of nature such as stones, wood, metals, grass, cotton, wool, linen materials and so on· Natural stones add a level of magnificence which is not comparable to artificial decorative materials.

Both natural and artificial decorative materials when properly arranged in the house in an orderly and pleasing manner, they can make the house appear beautiful.

Figure 2.22: Grass basket

Figure 2.23: Grass house plant

Advantages of natural decorative materials

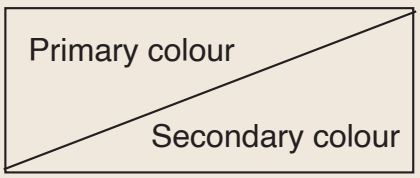
- They are a great calmer to the eyes and soul.
- Their simple positive natural tranquillity creates a true fine glamour without much effort.
- They are eco-friendly.
- Fit well on any budget.
- Help to recycle your goods.

Learner's Activity 2.10

1. Using natural decorative materials like stones and grass, decorate the living room or your class room.

Unit assessment

1. Using a colour wheel, select three pairs of complementary colours.
2. Using a primary or secondary colour shade the following figure:



3. How can you use warm colours and cool colours to create beauty in the home?

Relating this unit with other subjects

The aspects of colours are studied in a number of subjects. These include

Subject	
Physics	Primary and Secondary colours, wavelength of colours, measurement of colours are studied in Physics. They help us to appreciate colours as a science.
Fine Art	Colours and decorative materials are studied in fine art. Designing involves combination of colours to bring about an artistic impression.
List other subjects where colours and decorative materials are studied that you know.	
Subject	Content
.....	.....

UNIT SUMMARY

Youhavelearntaboutcolours,itstypesaswellasprinciplesanduseofcolours.Theunithas alsolookedatdecorativebackgroundsanddecorativematerialsaswellastheiradvantages.

GLOSSARY

Carve: to make objects, patterns and so on by cutting away materials from wood or stone

Colour: the appearance that things have resulting from the way in which they reflect light

Cool colours: these are colours related to the cool water or the sky

Decoration: a thing that makes something look more attractive on special occasions

Design: the art or process of deciding how something will look, work and so on

Embellish: to make something more beautiful by adding decorations to it

Ornaments: these are objects used for decoration in a room, garden yard

Primary colours: these are colours that cannot be broken down into other colours and no combination can produce them

Secondary colours: these are colours made by mixing two primary colours to produce another

Shades: these are colours made by mixing a colour with black.

Spectrum: a band of coloured lights inorder of their wavelength, as seen in a rainbow

Tints: these are shades or small amounts of a particular colour

Values: how much something is worth compared to its price

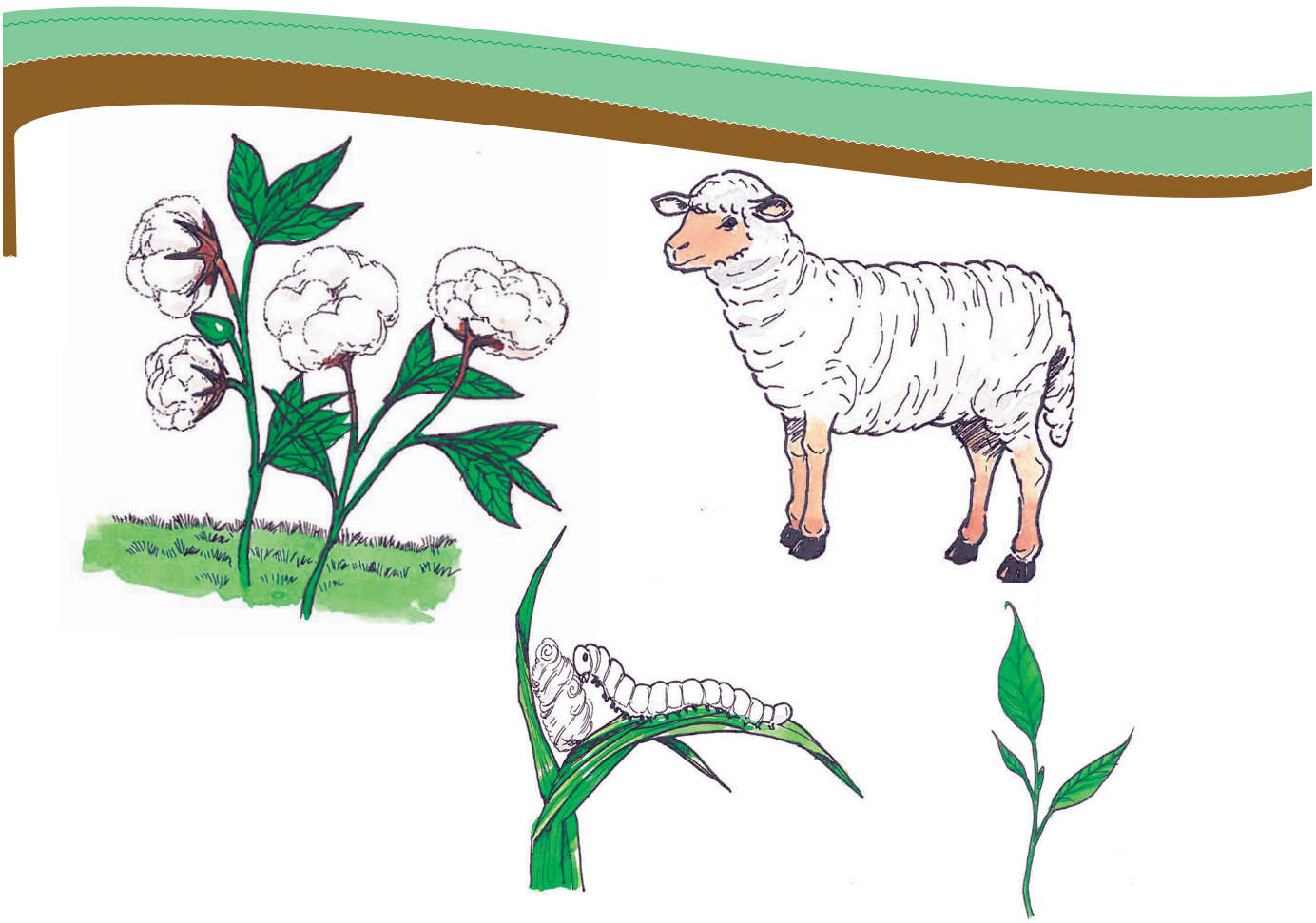
Warm colours: these are expanding or advancing colours related to fire or sunshine

Unit 3

SOURCE OF FIBRES

In this unit, I should be able to:

- identify sources of fibres and their characteristics.
- recognise sources of fibres and their characteristics.
- pay attention to natural and artificial fibres.



Key Unit Competence: Learners should be able to identify types of fibres and explain their characteristics

3.1. INTRODUCTION

We are all aware that fibres are the basic units for all textiles, the basic building blocks of fabric. Just take a look at the dresses and shirts you are putting on.

They are made of threads acquired out of fibres. Just try to pick a thread from a loose garment and untwist it open, you will evidently see the small fibres.

You know very well that there is variety of different fibres in circulation from which fabrics are made. This is the reason why, when you visit a shop with clothes you see a number of different types.

Fibres are thin, hair-like strands that are the basic units used to make fabrics textile products.

In this unit, we should grasp the knowledge and attain skills necessary to recognise the fabric we want to acquire by relating it with its specific characteristics and assessing its suitability to specific uses.

You are used to a variety of uses various fabrics have in our daily life. The study of Nature of Textile Fibres and Fabrics gives us the complete knowledge of sources, characteristics and uses of various fabrics available in the cloth shops.

This knowledge will enable us to choose wisely the fabric we wish to have and make the best use of it after we have bought it.

Learner's Activity 3.1

(a) Take a look at some garments provided by the teacher, pull out a yarn from the inner side of each and try to take out fibres. Study the similarities and differences among fibres in respect to their length and feeling.

The actual widthwise and lengthwise structure of fibres cannot be seen with naked eyes but can be recognised easily under the high power microscope. Here is the longitudinal (lengthwise) shape of some of the common fibres as visible under the high power microscope.

(b) Discuss sources and types of fibre and make a presentation in the class.

3.2. SOURCE AND CHARACTERISTICS OF FIBRES

From our discussion and presentation, we shall note that there are two types of textile fibres:

- **Natural Fibres**

  Plant – Linen, Cotton

Animal – Wool, Silk, Hair

Mineral – Asbestos

- **Artificial Or Manmade Fibres**

Regenerated – Viscose, Acetate, Triacetate, Lyocell

Synthetic – Nylon, Polyester, Acrylic, Elastane

Inorganic – Carbon, Glass, Metal, Ceramic

3.3. SOURCES OF NATURAL FIBRES

Figure 3.1: Plant flowers

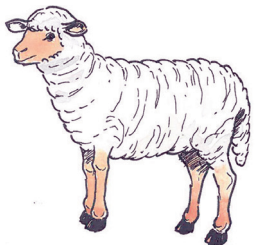


Figure 3.2: Wool from sheep

Figure 3.3: Linen from flax plant stems

Figure 3.4: Protein from animals (silk from silkworms).

It is important to note that, all fibres are made up of molecules referred to as polymers. The sources of natural fibres are:

Wool polymer, which is made up of protein and produces a short fibre known as staple fibre.

Cashmere is taken from the cashmere goat which is raised in cashemere region of India , Pakistan, Mongolia and china

Linen is made from the cellulosic fibres of the flax plant

Cotton grows on bushes which do flower. The seed produced forms pods called bolls which burs open when ripe. The boll is made up of a fluffy mass of creamy white fibres that are called cotton.

Mineral fibres: fibres can be particularly strong because they are formed with a low number of surface defects . Asbestos is a common example; it is a natural fibre used in fire resistant substances. Another manufactured mineral fiber is Rockwool.

Learner's Activity 3.2

Individually, observe and investigate fibre, yarn and fabric characteristics for cotton, linen, wool and silk.

Exercise 3.1

1. List two sources of textile fibres.
2. List and describe four sources of natural fibres.
3. How are synthetic fibres different from natural fibres?
4. Give two examples of plants where natural fibres are obtained.
5. Define synthetic fibres.
6. Explain why silk is an exceptional natural textile fibre as compared to plants, animals and minerals.

3.4. SOURCES OF ARTIFICIAL OR MAN-MADE FIBRES

Figure 3.5: Wood pulp

Figure 3.6: Milk

a) Regenerated fibres: These are made from cellulose that comes from natural sources, for example wood pulp , soya bean and milk protein. The cellulose is extracted by chemicals. Regenerated fibres are classified according to the system used to convert the cellulose into a solution that can be spun when dissolved into acetone chemical. For example viscose and acetate

Acetate is a combination of cellulosic and acetic acid which is made by a similar process of viscose. However, unlike viscose, acetate can be dry spun.

b) Synthetic fibres : These are all made by similar process but using different chemicals. Coal or oil is a raw material used. Simple chemicals are joined to form polymers in a process called polymerisation. These fibres are continuous filament fibres, long and always have to be spun into big rolls called **yarns**. The fact that they are made from laboratories using chemicals they get to be known

as **man-made fibres**.

Nylon was the first fibre to be made entirely from chemicals and coal.

Polyster is a versatile fibre which is synthesised from oil. It has a wide range of uses.

Acrylic is made from simple chemicals derived from oil. The polymer can either be wet spun or dry spun. The feel and handle is similar to that of wool.

Elastane is made from segmented polyurethane.it has a capacity to stretch and recover and is used mostly in a blend with other fibres.

Note: Regenerated fibres and Synthetic fibres can be produced by three methods of spinning; wet (viscose and acrylics), dry (acetate and acrylics) and melt (nylon and polyster) spinning

c) **Inorganic fibres** are made from naturally occurring materials that are inorganic rather than polymeric. Examples are Carbon, Glass, Metal, and Ceramic.

Figure 3.7: Nylon

Figure 3.8: Acrylic

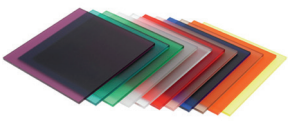


Figure 3.9: Polyester

The process of making yarn involves the following stages

i. Blow room processes
ii. Carding
iii. Combing
iv. Drawing
v. Roving

i. Blow room process: is the beginning stage in spinning process done by blow room section because of air flow.

ii. Carding: The fibre is combed to separate and form a silver.

Figure 3.10: Hand carders

Figure 3.11: Machine carder

iii. Combing: Removing short fibres (noils) leaving longer fibre (top)

Figure 3.12: Combing

Figure 3.13: Combing machine

iv. Drawing: Reducing of silver thickness ready for spinning.

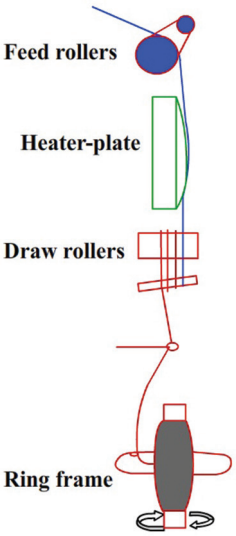


Figure 3.14: Drawing

v. Roving: Process of making spun yarn from wool fleece, raw cotton or other fibres.

Figure 3.15: Roving

Learner's Activity 3.3

Through touching or feeling, investigate the fabric characteristics of nylon, acrylic, polyester.

Get four different pieces of fabrics made from cotton wool, linen and silk. Touch them to feel their texture and surface. Give the different characteristics of the different natural fibres.

Characteristics of natural fibres

From our observation and investigation, we shall note that, when you look around there are four main natural textile fibres, namely:

i. Cotton
ii. Linen
iii. Wool
iv. Silk

Figure 3.15: cotton

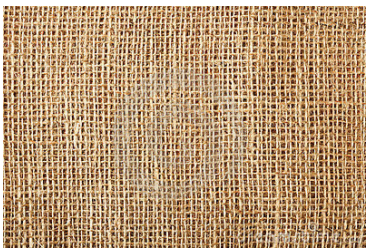


Figure 3.16: linen (flax)

Figure 3.17: wool

Figure 3.18: silk

By characteristic, Natural fibres are usually:

Abrasion resistance - the ability to withstand wear from repeated rubbing. From good to poor: nylon, linen, acrylic, cotton, wool (coarse), silk, wool (fine), rayon, acetate.

Absorbency - All natural fibres normally contain 10% or more water, and some can absorb up to 30% of their weight in water and feel dry to the touch. Synthetic have little or no absorbency (although, several of them do absorb oil). - from best: wool, flax, hemp, silk, cotton, ramie, nylon, acrylic, polyester.

Chemical, mildew & moth resistance - ph levels in your cleaning and dyeing baths can damage some of your fibres. Below 7 is acid, and above 7 is alkaline. Wool is

resistant to acids. Silk is resistant to organic acids but damaged by mineral acids. Cellulose fibres are harmed by acids - even vinegar can do some damage. Alkaline solutions can also damage protein fibres, but cellulose fibres are more resistant.

Elasticity - all fibres can be stretched - but they do not all have the same breaking point or the ability to recover from the stretch.

Flammability - wool offers the greatest resistance to fire, and other protein fibres are usually self-extinguishing. Cellulose fibres continue to glow after they are removed from the flame. Synthetic fibres vary, but range from acrylic that is so hot that it can ignite a combustible material if it drips on it, and others that have vinyl cyanide or vinyl chloride whose fumes are toxic.

Shrinkage - compare to a rubber band - it simply returns to its natural size. Shrinkage is caused by the way we spin, weave, and finish the fabric. If yarns are dipped in water or washed, and allowed to dry in a relaxed state before being woven (or knitted) they will cause less shrinkage.

Strength - length of individual fibres, and amount of twist in the yarn can help determine the strength of the yarn, but some fibres are stronger than others: in order from strongest: flax, hemp, silk, nylon, polyester, cotton, acrylic, wool, rayon.

Sunlight resistance - from good to poor: acrylic, polyester, flax, cotton, rayon, acetate, nylon, wool, silk. Not usually a problem for clothes, but for upholstery, rug and so on.

Warmth - retention of heat from high to low: silk, angora, wool, cotton, ramie, flax. Yarns can be spun to trap air and therefore be warmer. Woolen spun yarns being in that category.

Figure 3.19: Wearing a woollen warmer

Weight - from heaviest to lightest: cotton, flax, ramie, rayon, hemp, polyester, wool, silk, acrylic, nylon.

Wrinkle recovery - from good to poor: wool, silk, cotton, rayon, ramie, flax. When relaxed fibres are used then there is less tendency to wrinkle.

Cotton

Cotton from cotton plants is a cellulosic fibre acquired from "bolls" (seed pods) growing on branches. Cotton can be grown in a range of colours. It constitutes most of the main textile products of China and Mexico.

It is made into a wide range of wearing apparel for example; jeans, T-shirts and towels. In fact its end uses include a wide range of apparel: blouses, dresses, skirts, pants, underwear, and linens.

Figure 3.20: Cotton garments

Linen

Flax is the fibre name; linen is the fabric name. Linen is a fabric made from the woody stem of the **flax plant.** It is interesting to note that flax is the World's oldest textile fibre, dates back to Stone Age approximately 5,000 years.

It is cellulosic fibre from stem of flax plant. Flax products include; towels, sheets and tablecloths referred to as "linens".

The end uses of flax include; dresses, suits, jackets, home furnishings, draperies, table linens, dish towels (figure 3.1).Linen was originally used for bedding – that's where we got the name "linens".

Figure 3.21: Towels and draperies are examples of linen

Wool

Wool fibres come from the shaved hair of sheep or lambs. Also can be from Cashmere or Angora goat hair fibres. Wool is protein fibre from sheep or lambs, at times Worsted wool is higher quality with long staple fibres (over 2 inches). It is a Natural insulator. The term wool can only apply to all animal hair fibres, including the hair of cashmere or angora goat .wool can also be got from speciality hair fibres of camel, alpaca, llama, or vicuna. Wool is used for jumpers, suits and blankets. It's end uses include: sweaters, coats, suits, jackets, skirts, socks, scarves carpets, upholstery and blankets.

 Angora mohair	 Camel	 Cashmere (From Newzeland)
 Vicuna (South America)	 Cashmere (India)	 Goat

Figure 3.22: Table showing sources of wool.

Silk

Silk is a natural protein filament produced by Silkworm cocoons. These worms are used to make silk fibre, the only natural-filament fibre Silkworms do spin cocoons in filaments. The filament is a very long, fine, continuous thread. It can take as many as 500 cocoons to create 1 blouse for instance. Silk is commonly used for evening wear and ties. Silk's end-uses include; evening gowns, wedding gowns, lingerie, scarves, neckties, curtains and decorative pillows.

Characteristics of synthetic fibres

Acetate 	Nylon 
Acrylic 	Polyester 

Figure 3.23: Table showing manufactured fibres

Acetate

Acetate has a luxurious appearance with crisp (texture) soft hand, a wide range of colors; it dyes and prints well. It also drapes well, it shrinkage, moths, and mildew, it has a low moisture absorbency, relatively fast drying and no pilling. It is a little static. Acetate requires dry cleaning, it is rather weak, heat sensitive, poor at abrasion resistance and easily dissolved by nail polish remover (acetone).

Nylon

Nylon is used for active sportswear, fleece jackets, socks and seat belts.

Figure 3.24: Nylon dress

Acrylic

Acrylic fibre was manufactured in the 1950's by DuPont. It was originally used for blankets and sweaters because it resembled wool. It is now commonly used for jumpers, fleece jackets and blankets.

Polyester

Polyester is a synthetic fibre developed in the 1950's by DuPont.

It is used for raincoats, fleece jackets, children's nightwear, medical textiles and working clothes.

Learner's Activity 3.3

Individual practice on experimentation of characteristics of fibres.

Unit assessment

1. Define textile fibres
2. What are the two types of fibres ever known?
3. List four major sources of natural fibres
4. What are synthetic fibres?
5. Through touching and seeing give general characteristics of the fibres below;
   Cotton, linen, wool, silk
6. With the help of diagrams, give lists of examples of the following fibres.
   Plant or vegetable fibres, animal fibres and mineral fibres
7. Name the materials that are made from each of the following fibres. Cotton ,wool ,silk
8. List the stages of making a yarn.

Links to other subjects:

Organic Chemistry (Polymerisation) in Chemistry:

Polymers

Plastics as known to the general public are known to chemists as polymers. A polymer is a macromolecule which consists of small molecular units that are repeated over and over again to form a long chain.

Properties of matter and elasticity in Physics

Elastic properties of materials

In everyday conversation if someone speaks to you about an elastic body, you probably immediately think of a rubber band. A rubber band yields a great deal to a distorting force, and yet it returns to its original length after the distorting force is removed. Can you think of some biological examples of elastic bodies? In this chapter we will examine the elastic properties of materials.

Elasticity

Elasticity is a fundamental property of materials. Springs of all kinds are examples of elastic bodies. Let us consider the characteristics of a spring. We find that a spring will respond to distorting force and then return to its original shape after the distorting force is removed. Any material or body can be deformed by an applied force. If it returns to its original shape after the force is removed, it is said to be elastic. Most substances are elastic to some degree. In a technical sense a substance with a high elasticity is one that requires a large force to produce a distortion-for example, a steel sphere.

UNIT SUMMARY

In this unit we have looked at the source and characteristics of fibres . Fibres are categorised into two; natural and artificial or man-made fibres. Natural fibres originate from natural sources mainly plants (cellulose or animal (protein). Manufactured, synthetic, or man-made (terms interchangeable), originate from chemical sources and may also be from regenerated or recycled sources. Natural fibres are from, plant or vegetable fibres, animal fibres and mineral fibres . Artificial or man-made are from regenerated fibres and synthetic fibres . We also covered the characteristics of natural fibres and characteristics of synthetic fibres

UNIT GLOSSARY

Elasticity: is a fundamental property of materials. Springs of all kinds are examples of elastic bodies

Fibres: basic units for all textiles, the basic building blocks of fabric

Manufactured, synthetic, or man-made (terms interchangeable) - fibres that originate from chemical sources and may also be from regenerated or recycled sources

Mineral fibres: the fibres which are produced from materials that are present in the earth's crust (or can easily be made from naturally occurring materials there) and that are inorganic rather than polymeric

Natural fibres: fibres that originate from natural sources mainly plant (cellulosic) or animal (protein)

Polymer: a macromolecule which consists of small molecular units that are repeated over and over again to form a long chain

Regenerated fibres: these fibres are made from extremely small cotton fibres or any other fibre source such as wood pulp, milk protein

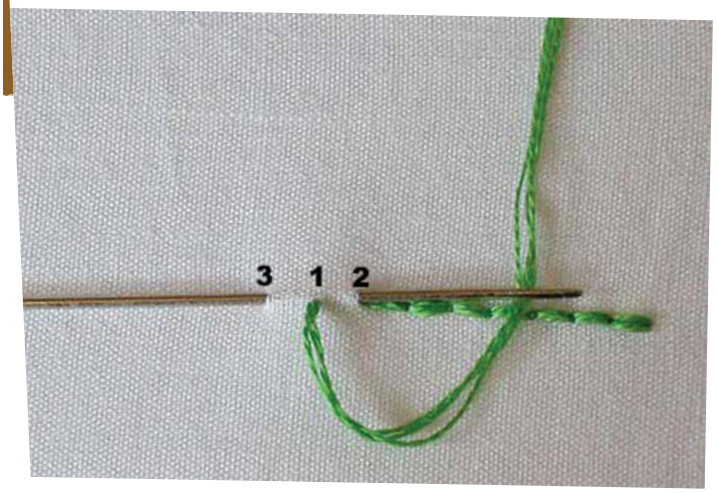
Unit 4

SEWING MATERIAL, TOOLS AND EQUIPMENT FOR BASIC STITCHES

Learning objectives

In this unit, I should be able to:

- Explain basic stitches and their techniques
- use sewing materials, tools and equipment
- apply the basic stitches and their techniques



Key Unit Competence: Learners should be able to identify basic sewing materials, tools, equipment and sew basic stitches

4.1. INTRODUCTION

A good knowledge of sewing materials, tools and equipment will help in using well appropriated tools for quality products on top of rendering the garment making process simpler. The type of sewing equipment, best tools usage in construction of various parts of the garment, uses of each sewing item and distinguishing between various sewing items is importantly vital.

4.2. SEWING MATERIALS, TOOLS AND EQUIPMENT

Learner's Activity 4.1

- Discuss and make a presentation on sewing materials, tools and equipment.
- List and explain each sewing material, tool and equipment.
- Make sketches of tools used in sewing.

From our discussion and presentation, we shall identify the sewing materials and equipment and note the following:

4.3. TOOLS

Needle

There are a variety of needles. Needles come in various lengths and the shafts have different diameters and the points are different as well as the eye sizes. Some needles have double eyes / self-threading needles.

Others have very large eyes used to put together sweaters, some are curved used to sew cushions some are slender and long used to sew beads and so on.

Needles go hand in hand with a needle threader, which helps in threading needles since needle eyes are very small.

Learner's Activity 4.2

Describe the use of the following sewing tools and materials.

Figure 4.1: Needles

Scissors and shears

Scissors are for cutting fabric. They come in different sizes what is important to note is their sharpness or have good sharp points because it is those points that are used to cut. When using such tools you have to choose those that make you feel comfortable because they are used a lot.

Figure 4.2: Scissors

Figure 4.3: Using scissors

Figure 4.4: Shears

Figure 4.5: Using shears

Most work carried out by such tools is on straight edges but in case of lessening the fraying a fabric is going to do, pinking shears are used. They have a bent handle and a blade that cuts zigzag.

Tape measure

A tape measure or measuring tape is a ribbon of cloth, plastic or metal with linear measure makings. Very important tool. It comes in 150 cm and 300 cm length. It's better to shop for one that is marked at opposite ends. Tapes come in a variety of colours, fibre glass is good but it's better to get a material that is not going to stretch. To use a tape measure, hold it and place it on the dimension of the measurement you wish to take.

Figure 4.6: Tape measure

Figure 4.7: Using a tape measure

Metre rule

Is a tool to measure distance up to three feet.

A sewing gauge, 6 inches long and divided into different measuring formats, inches and metric with a slider for holding pre-measured in formats at a particular measurement and keep repeating it without focusing at a measurement. It can be used to measure a long distance makings along edges,

Figure 4.8: Meter rule

Figure 4.9: Using metre rule

Tracing wheel

Tracing wheels: These come in two styles, one with a serrated edge for use on most fabrics and a smooth edge for delicate fabrics. Tracing wheels are used with dressmaker's tracing paper to transfer construction markings from the pattern to the garment pieces.

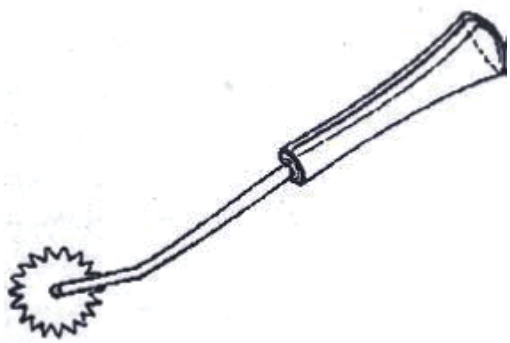


Figure 4.10: Tracing wheel

Figure 4.11: Using a tracing wheel

Sewing machine used when stitching fabric and other materials together with threads. A sewing machine is designed for one person to sew individual items while using a single stitch type.

Figure 4.12: sewing machine

Figure 4.13: Using a sewing machine

Thimble- made of either plastic or metal material which is used to protect the finger from being pricked by the needle when sewing. A fitted thimble will help you sew comfortably especially when you are not used in sewing with a thimble on your finger.

Figure 4.14: Thimble

Figure 4.15: Using thimble

Sewing Box- serves as a utility box. Sewing tools like pins, thread, thimbles, and others can be kept in this box. Sewing boxes vary in style, such as the compartmentalised and non-compartmentalised box. A compartmentalised sewing box is practical because your tools can always be orderly arranged.

Figure 4.16: Sewing Box

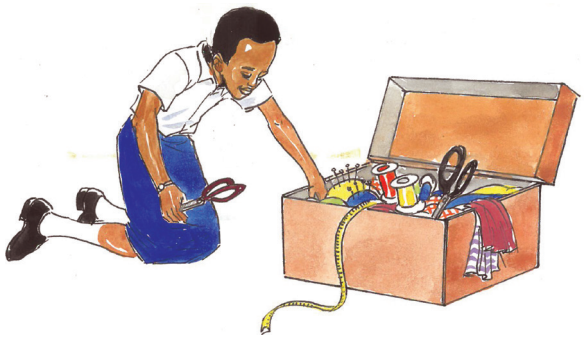


Figure 4.17: Using a sewing Box

L-square - It is useful in constructing perpendicular lines with divisional parts located in longer and shorter arms. L-square is used for altering patterns, squaring off fabric straiht edges and for locating grains on fabrics.

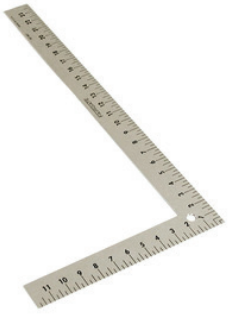


Figure 4.18: L-square

Figure 4.19: Using L-square

The **Hip Curve** is used in connecting or shaping slightly curved points. It has a measure of inches at the front and centimetres at the back part.

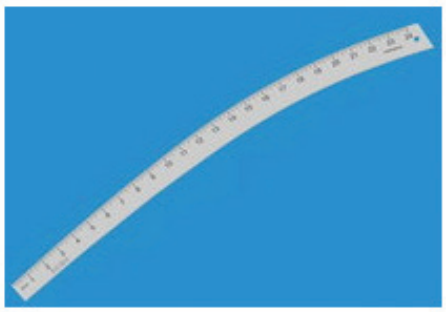


Figure 4.20: Hip Curve

Figure 4.21: Using hip curve

Hem Gauge- a measuring device marked with various depths and hemline folds. It is practical when hemming straight on grain edges.

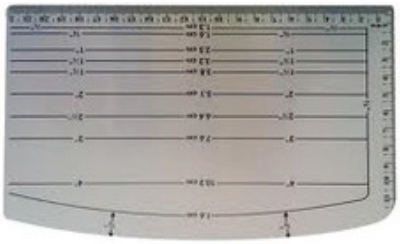


Figure 4.22: Hem Gauge

Figure 4.23: Using hem gauge

Sewing gauge- a 6 inch gauge with a movable indicator convenient for measuring short lengths.

Figure 4.24: Sewing gauge

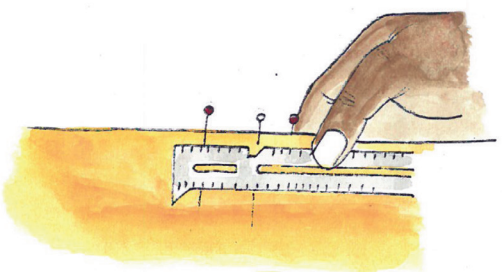


Figure 4.25: Using sewing gauge

4.4. SEWING MATERIALS

Pins

When using shears to cut the fabrics you will be pinning the fabric to the pattern paper and the pins will hold that. Pins are placed every 10 to 15 cm pins are very important so they should be chosen with care.

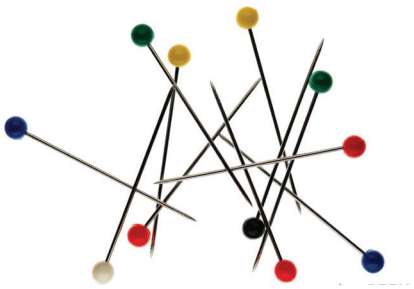


Figure 4.26: pins

Figure 4.27: Using pins to pin fabric when sewing

Sewing threads

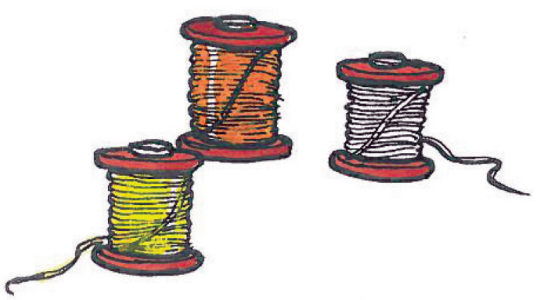


Figure 4.28: Sewing threads

Figure 4.29: Using sewing threads

A **thread** is a highly twisted and smooth strand of fibre. It is used for sewing, embroidery and so on.

Pin Cushion- a cotton-stuffed cloth cut and sewn in many different shapes to keep the pins in place. It will help you work conveniently when placed on your waist.

Figure 4.30: Pin Cushion

Figure 4.31: Using pin cushion

Emery Bag- used for thrusting needles and pins. It helps in sharpening the needles and removing rust.

Figure 4.32: Emery bag

Figure 4.33: Using emery bag

A tailor's ham or dressmaker's ham is a tightly stuffed pillow in the shape of a ham used as a mold when pressing curves such as sleeves or collars.

Figure 4.34: A tailor's ham

Figure 4.35: Using a tailor's ham

4.5. EQUIPMENTS

Cutting board/table- a flat board placed on a table where the fabric is laid out and cut. The fabric can be pinned securely to the cutting board/table to prevent it from slipping.

Figure 4.36: Cutting board/table

Figure 4.37: Using Cutting board/table

An ironing board - is a small, portable, foldable table with a heat resistant surface.

Figure 4.38: Ironing board

Figure 4.39: Using Ironing board

Learner's Activity 4.3

- Individually practise the use of sewing materials, tools and equipment.

Pressing equipment:

Iron

Figure 4.40: Woman ironing with an electric iron

Household iron:

This is used to iron clothes in the home. Locally household iron is designed to use charcoal as a source of heat and it is commonly used in rural areas where there is no electricity. However, there are irons which use electricity and are commonly found in urban areas where there is electricity.

Exercise 4.1

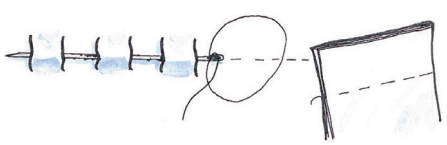
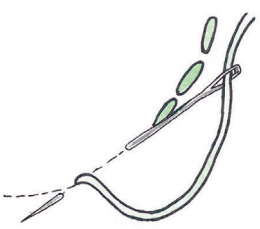
1. Differentiate between ironing boards and irons.

4.6. IDENTIFICATION OF BASIC STITCHES AND THEIR TECHNIQUE

A **stitch** is a single turn or loop of thread or yarn. Stitches are the fundamental elements of sewing, knitting, embroidery, crochet and needle lace-making, whether by hand or machine.

A variety of stitches, each with one or more names, are used for specific purposes.

Identification of basic stitches and their technique

Running	Backstitch
	

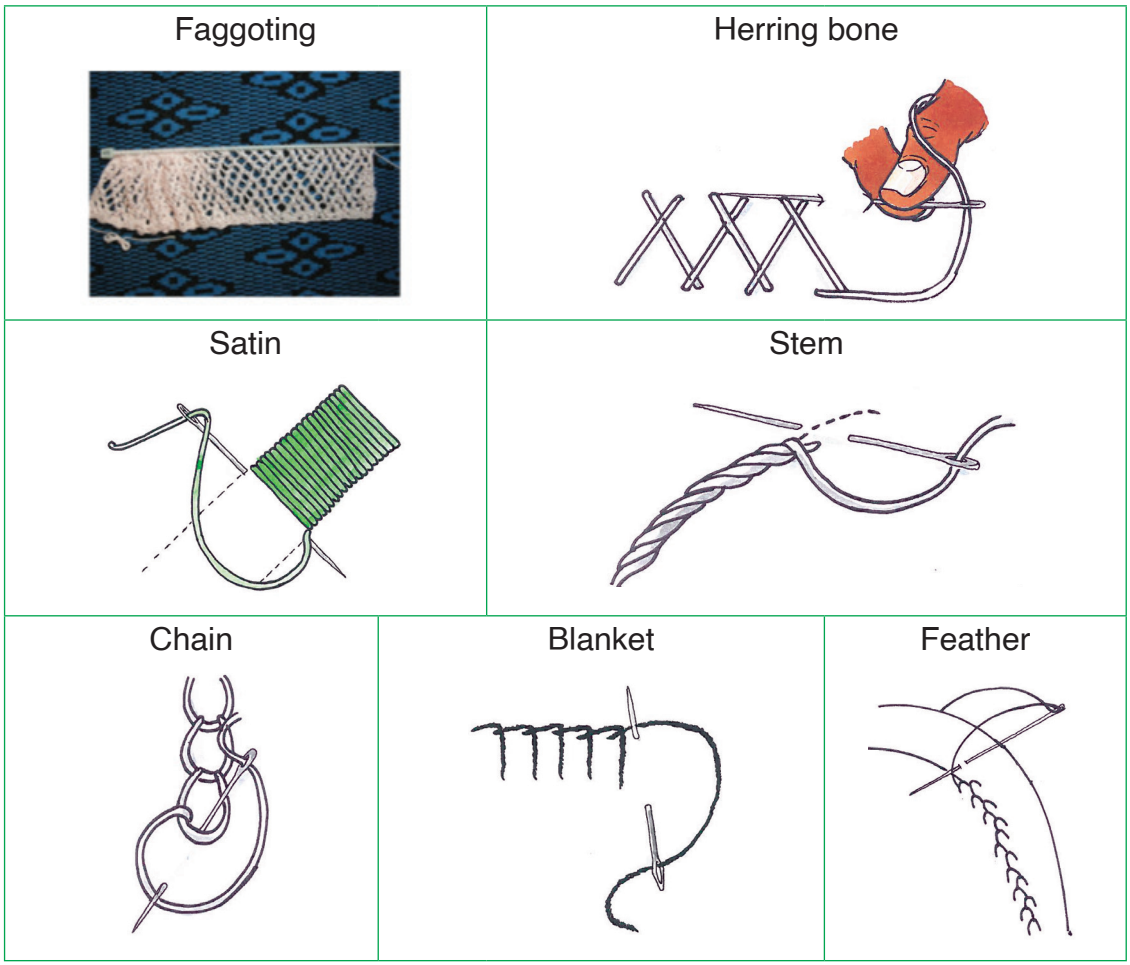


Figure 4.41: Basic stitches and their techniques

Running Stitch

A running stitch is the go-to stitch for beginners: It is easy neat, and it gets the job done. The job, of course, is sewing two pieces of fabric to one another. You can use it to repair hems and holes as well.

To do a running stitch:

1. Simply thread your needle and knot the thread,
2. Run the needle through the fabric in an over-under-over-under pattern until you reach the end.

NB: Smaller, tighter stitches take longer, but are much more secure, and a large running stitch can be used to "baste" two fabrics together temporarily. It will look like a dotted line when it is complete.

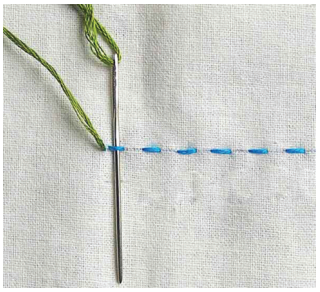


Figure 4.3: Running Stitch

The back stitch

The back stitch is another very basic stitch that can be utilitarian or decorative, and its one of the simpler types of stitches, too.

To do it, simply:

1. Bring your needle up through the back of your fabric.
2. Take one running stitch.
3. Instead of pulling your needle up after a small space though, pull it up right before the place where your last stitch ended. This will give you a nice, consistent look.

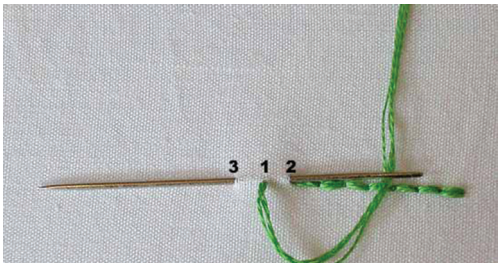


Figure 4.5: Backstitch

Blanket stitch

Blanket stitches are usually found on–you guessed it–the edges of blankets. The stitch can be used to finish a raw hem by hand, or as a decorative element. It is actually one of the most popular types of embroidery stitches, where it is sometimes called a **buttonhole stitch** and is done with much more intricacy.

To do this one:

1. You knot the thread and pull your needle from the back to the front of the fabric, anchoring it.
2. Push your needle through your first stitch's entry point, making a vertical stitch and leaving a loop of thread loose.

3. Bring the needle through the loop, and make a new vertical stitch, leaving a new loop of thread, but pulling the first loop of thread tight (but not too tight!). When you're done, you should have a uniform line of threads running along the raw edge, and evenly spaced vertical stitches perpendicular to that.

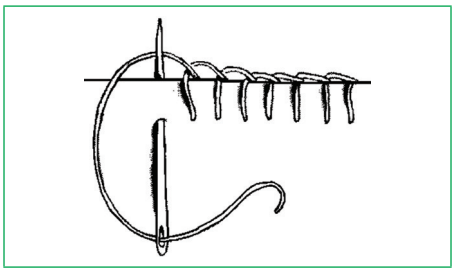


Figure 4.5: Blanket stitch

Herringbone stitch

Herringbone Stitch is also called plaited stitch or catch stitch, and is often used to work decorative borders and to accent the patchwork in quilting.

Techniques involved in the herringbone stitch.

1- Bring your thread to the front on the bottom line.

2- With your thread below the needle, take the needle from right to left on the upper line picking up approximately 1/16 inch of fabric. You can space this stitch tightly or loosely and vary the depth as well, depending on the look you want.

3- Pull the needle through. With the thread above the needle, take your needle from right to left on the bottom line, picking up 1/16 inch of fabric and spacing it the same distance away as your first stitch.

4- Pull the thread through. With the thread below the needle, pick up 1/16 inch of fabric on the upper line, the same distance away as before.

5- Continue working evenly-spaced stitches, alternating between the upper and lower lines.

6- Now, if you want to get a little fancier, do another row of herringbone stitch in a contrasting colour in between your first row. Interlace your threads by weaving them under and over the first row. This is called double herringbone or Indian herringbone

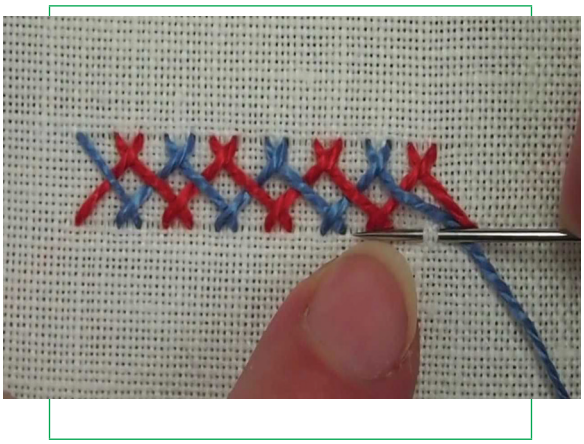


Figure 4.6: Herringbone stitch

Satin stitch

In sewing and embroidery, a satin stitch or damask stitch is a series of flat stitches that are used to completely cover a section of the background fabric. Narrow rows of satin stitch can be executed on a standard sewing machine using a zigzag stitch or a special satin stitch foot. Satin stitch has a very easy procedure.

Satin stitching by hand takes precision. Practice on spare fabric first so you get a sense for how tight to stitch, and how to keep the stitches as close as possible.

Satin stitch Techniques step by step

1- Start with a simple square or circle before trying intricate satin stitch patterns

2- Place the fabric in an embroidery hoop. Always keep the area you're embroidering in a fabric hoop. This will keep the fabric tight and flat while you work.

3- Choose a narrow area. Only include satin stitches in narrow spaces, no more than $\frac{1}{2}$ inch (1.25 cm) wide. Long satin stitches will float loose and look messy.

4- Stitch as close together as possible. You do not want any gaps between two stitches. Stitch as close as you can without tangling the threads, in tight parallel row

5- Achieve even tension. Practice the satin stitch until you can pull the threads tight enough to lie flat, but loose enough that they don't distort the shape of the cloth. Stitching too tightly is a common mistake. Try to use a consistent tension for each stitch, or you'll have loose threads.

Figure 4.7: Satin stitch

Stem stitch

Stem stitch is crewel stitch. It is one of the easiest to be done .many times, people often refer to embroidery work itself as crewel work.

Procedures of making a stem stitch.

1. Draw a temporary stitch line with a pencil. A stitch line is through which all stitches will be running. Now, note that all the stitch points ABCD in stem stitch will fall on the stitch line figure 4.7 work this stitch from left to right. This instruction is for right handed learners.

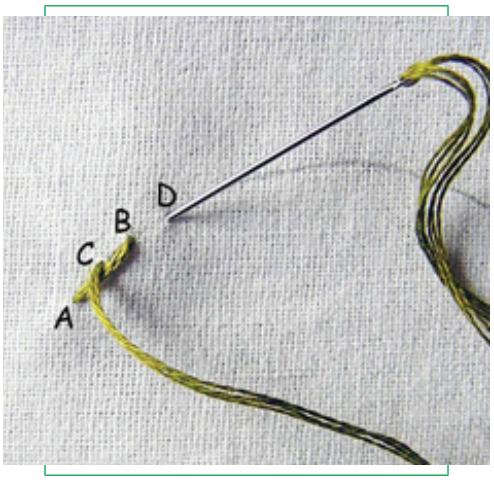
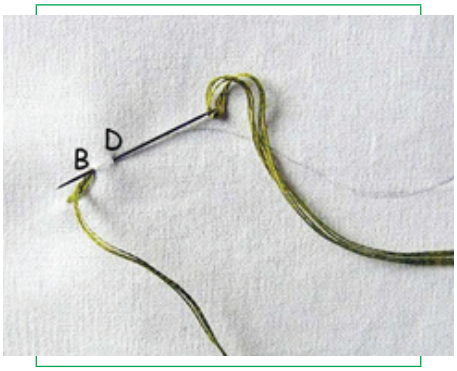


Figure 4.8: Stitch line ACBD

2. Bring out the thread through **A** and take it in through **B**. Take the needle backwards and bring the thread out through **C** figure 4.7. Make sure the point **C** lies over the stitch **A-B** in figure 4.7



Stitch line BD

3. Take the needle in through **D**. Try to mark **D** in such a way that the point **B** will lie half way through **C-D**. Bring the needle out through **B** figure 4.8.

You need to note that the point **C** lies about half way through **A** and **B**. Also note that **C** lies on top of the stitch **A-B**. So, all the subsequent stitch points will lie on top their previous stitch figure 4.9.

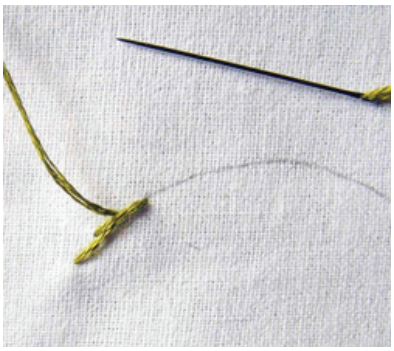


Figure 4.9: Subsequent stitch points

So, the pattern of two stitches of the stem stitch will be as shown above figure 4.10.

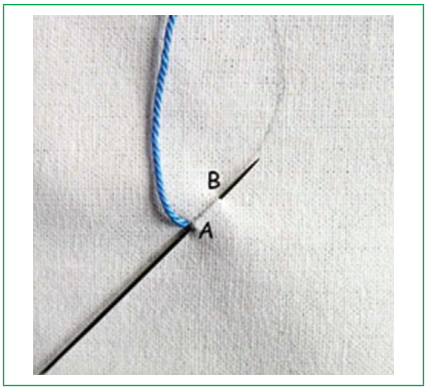
Figure 4.10: Two stitches of the stem stitch

Chain stitch

This is the basic and simplest of the chain stitch family. It gives a chain like appearance or, like petals lined up one after the other.

Chain stitch techniques;

1. Do this stitch from top to bottom. Generally, it follows a left to right path.



Left to right needle path

2. Bring the thread out through A. Put the needle back in A and bring it out through the point B, but don't pull the needle out completely

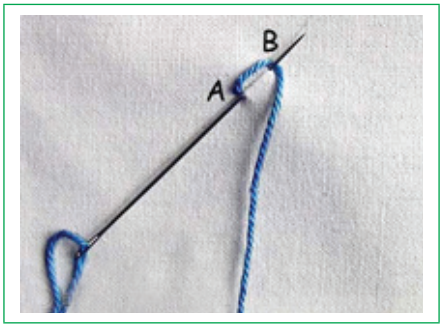
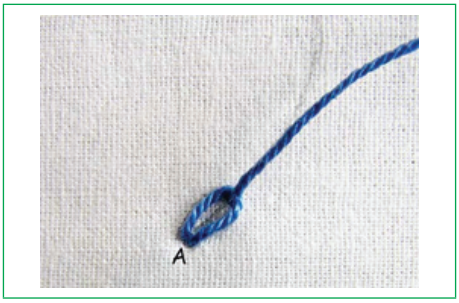


Figure 4.11: Needle out at B

3. Now, take the thread around the needle from left to right to form a loop. Figure 4.12 and 4.13



The loop

4. Pull out the needle now to tighten the loop and you will get the first part of the chain. Figure 4.4

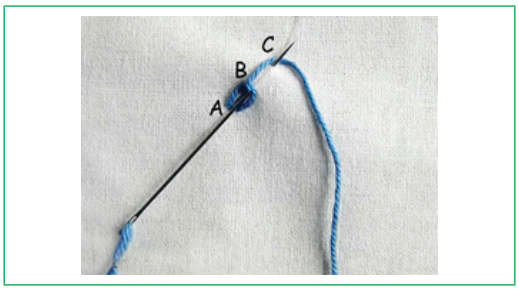


Figure 4.12: Tighten the loop

5. Now, put the needle in through B (now inside the loop) and bring it out on C (outside of the loop).

Figure 4.13: The chain

6 Continue the action by taking the thread around the back of the needle from left to right to form a loop and pull out the needle to get the next loop of the chain. Keep on with this procedure to finish the design. Figure 4.13

Faggoting

Faggoting is a variation of lace knitting, in which every stitch is a yarn over or a decrease. There are several types of faggoting, but all are an extremely open lace similar to netting.

Like most lace fabrics, faggoting has little structural strength and deforms easily, so it has little tendency to curl despite being asymmetrical. Faggoting is stretchy and open, and most faggoting stitches look the same on both sides, making them ideal for garments like lacy scarves or stockings.

To work:

1- Turn under the raw edges as if for an ordinary hem and tack place hemmed or slip stitched these edges. If a narrow hem, they can be left just tacked, as the faggot stitch will keep the edges together. All stitches should be made as invisible as possible.

2- The edges of the material are then tacked on to firm paper, parallel to one another and about $\frac{1}{8}$ inch apart. The tacking through to the paper holds the material in place while the Faggot stitching is being worked. The distance between the hems can vary, depending on the material used or the use to which the faggoting is put. No matter what the spacing is, it must be kept regular and at the same tension throughout the work piece.

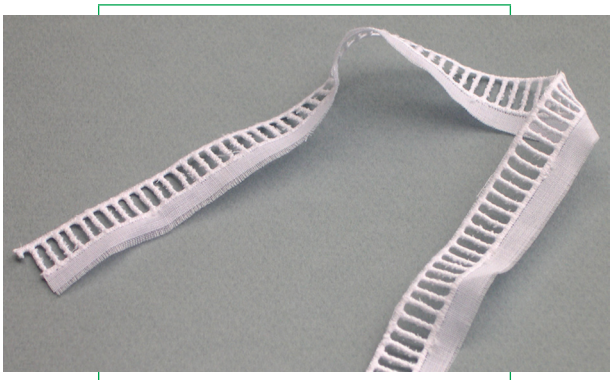


Figure 4.14: Faggoting

Feather stitch

Feather stitch is a decorative stitch, usually, used to accompany it with embellishments or other forms of stitches like the French knot. This stitch can be used liberally to make beautiful borders, horizontal or vertical fillings, or even designs with curves. It looks like a series of interconnected 'V's.

It is always advised to make stitch lines to avoid any asymmetry. I have made four parallel stitch lines, **A, B, C, D** figure 4.17. The stitches will fall between these lines and the needle will pass through these lines.

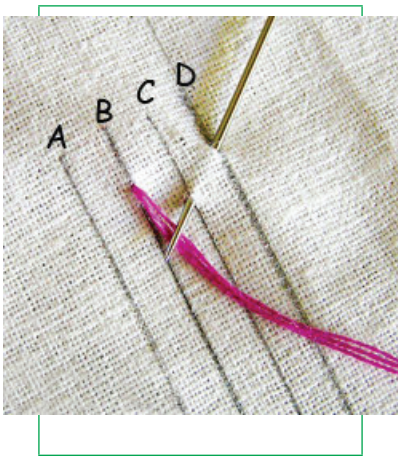


Figure 4.15: Parallel stitch lines

1. Begin by bringing up the needle from **B**. Now, put the needle in through **D** and bring it out from **C**.

   Note that the points on **B** and **D** falls on a straight line, and **C** lies diagonally to both **B** and **D**.

   Pull the needle out with the thread under it, as shown. We would form our first 'V' figure 4.18.

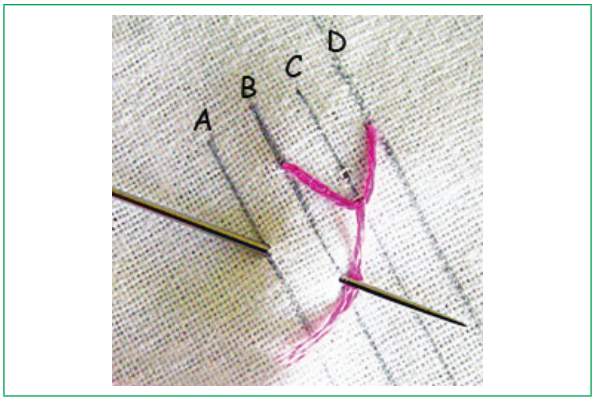


Figure 4.16: The first "V"

2. We now move to make our next 'V'.

Continue to put the needle in through **A** and bring it out through **B**. Pull the needle out with the thread under it as shown, to make the next 'V' figure 4.19.

Figure 4.17: Needle through A and B

Figure 4.18: Feather stitch

Now, continue the procedure by putting the needle in through the outer stitch line and bringing it out from the inner stitch line.

We keep alternating between the left and right side to make the 'V's- putting in the needle through **A** and bringing it out from **B**; putting the needle in through **D** and bringing it out from **C**.

Exercise 4.2

1. Define and draw illustrations for each of the following types of textile stitches

i.	Running	ii.	Back	iii.	Blanket
iv.	Herring bone	v.	Satin	vi.	Stem
vii.	Chain	viii.	Faggoting	ix.	Feather

Learner's Activity 4.4

- Research and make presentation on basic stitches and their techniques.

Learner's Activity 4.5

- Make simple objects using basic stitches.

Unit assessment

1) What are the uses of the sewing equipment ,materials and tools given below:

a. Needles	b. Scissors	c. Tracing machines
d. Tape measure	e. Pins	f. Metre rule
g. Sewing threads	h. Iron	i. Ironing table

2) With the use of diagrams define the following stitches and how they operate.

a. Running	b. Back	c. Blanket
d. Faggoting	e. Satin	f. Stem
g. Herringbone	h. Feather	i. Chain

UNIT SUMMARY

In this unit, we have looked at the sewing materials, tools and equipment which included: needle, scissors, tape measure, pins, metre rule, tracing machine, sewing threads. We also looked at pressing equipment, iron, ironing board and tables .

Then we identified the basic stitches and their techniques. The stitches included: running, back, blanket, herring bone, satin, stem, chain, faggoting, feather.

GLOSSARY

Chain stitch: a sewing and embroidery technique in which a series of looped stitches form a chain-like pattern

Faggoting: is a variation of lace knitting in which every stitch is a yarn over or a decrease

Feather stitch: a decorative stitch, usually, used to accompany it with embellishments or other forms of stitches like the french knot

Herringbone stitch: a needlework stitch used in embroidery, knitting and crochet.

Metre rule: a tool to measure distance up to three feet (a yard)

Running stitch: is the go-to stitch for beginners. it is easy, neat and it gets the job done. the job of course is sewing two pieces of fabric to one another. you can use it to repair hems and holes as well

Stitch: a single turn or loop of thread or yarn

Thread: a highly twisted and smooth strand of fibre. it is used for sewing, embroidery and so on

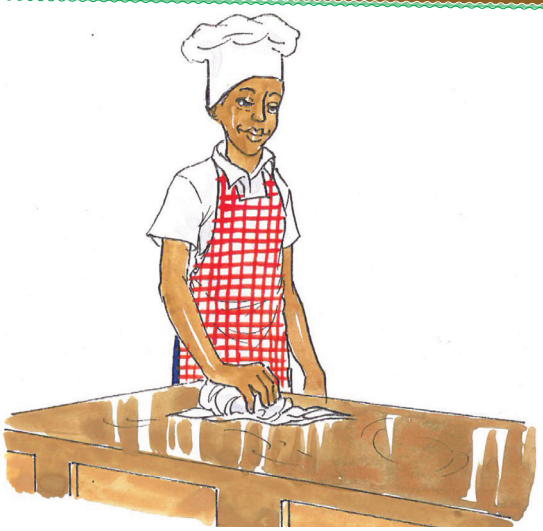
Unit 5

FOOD HYGIENE AND SAFETY TECHNIQUES

Learning objectives

By the end of this unit, I should be able to:

- apply food hygiene and sanitation at workplace
- practice hygiene procedures accordingly
- maintain workplace hygiene and sanitation



Key unit competence:

Learners should be able to apply procedures of food hygiene, risk and safety.

5.1. INTRODUCTION

Are you aware that food is a potential source of infection? Do you know that food is liable to contamination by micro organisms at any point during it's journey from the produce to the consumer? So what is food hygiene?

Food hygiene means hygiene in production holding distribution and serving of all types of food which intended to prevent food poisoning and food borne illness.

5.2. IMPORTANCE OF FOOD HYGIENE AND SANITATION AT WORKPLACE

Learner's Activity 5.1

1. Identify the different materials that make your classroom environment dirty.
2. Collect all of them and throw them in a dust bin.
3. Explain how the classroom environment can be kept clean.

We have all washed hands before, after and during food handling . By doing this, we are ensuring that our food is clean and safe.

Food hygiene means preparation of foods in a way that is safe for human consumption, whereas the term usually refers to protection of food from contamination.

Food hygiene in the home kitchen includes; the proper storage of food before use, washing one's hands before handling food, maintaining a clean environment when preparing food and making sure that all serving dishes are clean and free of contaminants.

Figure 2.1: Clean work surface

In general, the hygiene and sanitation at work place

Helps to reduce the risk of food poisoning,

Obey the law of national bureau of standards,

Control harmful bacterial which can cause serious illness like stomachache, diarrhoea, vomiting, nausea and even death However, a good food hygiene is essential to make or sell food that is safe to eat.

Exercise 5.1

1. What is the meaning of food hygiene?
2. Discuss the importance of food hygiene and food sanitation at workplaces.

5.3. FOOD HYGIENE PROCEDURES

Learner's Activity 5.2

Let us practise one by one food handling according to food hygiene and safety procedures.

According to our activity above, we shall find out how to handle food according to food hygiene and safety procedures as indicated below.

(i) Food hygiene

The nature and composition of food makes it susceptible to microbial and enzymatic spoilage. Therefore proper hygiene should be ensured in order to prevent food contamination. This should be done through ensuring that both the food handler and the food processing area are maintained clean.

Rules for food hygiene

- Food must be protected from flies, mice or domestic animals.
- Food must not be touched with hands that have been in contact with any dirt.
- Food must be stored, prepared and cooked in clean utensils.
- Food should be cooked while fresh and at a correct temperature.
- Cooked food should be eaten while hot or immediately.
- Cooked food should be stored while well covered.

5.4. CLEANING AND SANITIZING PROCEDURES

In order to ensure food hygiene, the following should be considered:

a. Personal hygiene b. Kitchen hygiene

a. Personal hygiene

1. Hands should be washed thoroughly with soap and water before food is handled and always after visiting the toilet or using a handkerchief. Also immediately after preparing raw meat or poultry.

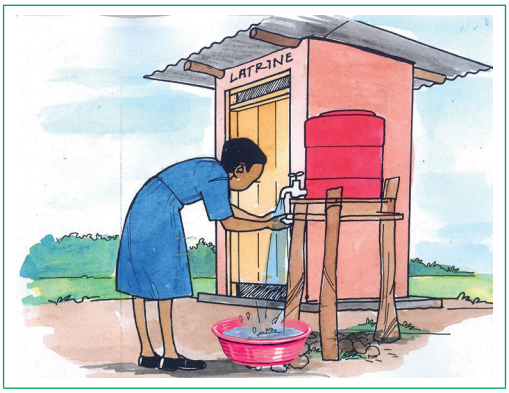


Figure 2.2: Washing hands after visiting the toilet

2. Hands should be free from cracks, roughness and abrasions and nails should be short, clean and unbroken.
3. Rings should be removed and nail vanish should not be used.
4. Wounds and cuts should be covered with clean water proof plasters.
5. Fingers should not be licked also avoid fingering other parts of the body such as nose, hair, ears, mouth and others when preparing food.
6. Use clean disposable paper tissues for blowing the nose rather than handkerchiefs and wash hands every after blowing.
7. Wear some form of protective clothing such as an overall or an apron.

Figure 2.3: Wearing protective clothing

8. Hair should not come in direct contact with food, it can be tied back or covered during food handling.
9. Individuals suffering from any illness should not prepare food for others.
10. It is not hygienic to allow animals in the kitchen.

(ii) Kitchen hygiene

Learner's Activity 5.3

Cleaning of the kitchen tools, materials and equipment.

After carrying out your activity of cleaning kitchen tools, materials and equipment, you should also note the following:

1. There should be nothing in the kitchen to attract vermin. Any food spilt should be cleaned up once and leftovers from meals disposed of hygienically.
2. All equipment and utensils should be kept very clean.

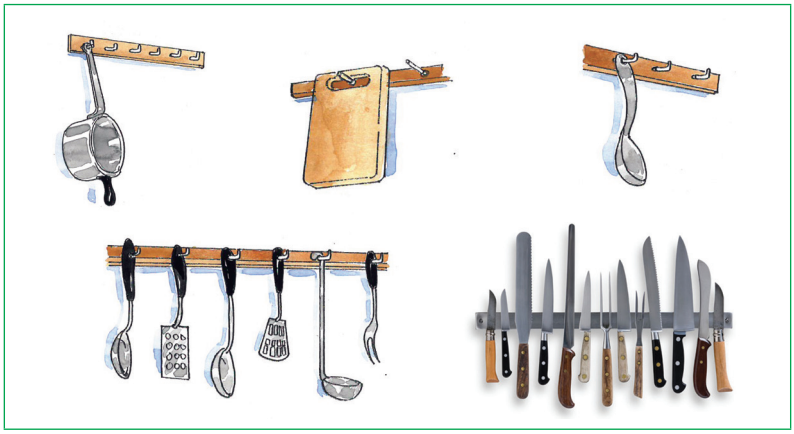


Figure 2.4: Clean kitchen equipment and utensils

3. Work surface should be washed everyday. The floor should be swept more than once a day, washed when spills occur and cleaned thoroughly at least once a week.
4. Dishes, clothes and table towels should be washed daily. Soaking in bleach and boiling are recommended. Dirty clothes are a dangerous source of infections.
5. Dispose of all scraps promptly using small waste bins which should be lined up with plastic bags and emptied daily, clean with detergent and drains should be disinfected regularly.
6. Large bins should be kept outside positioned away from windows leading to the kitchen ladder. Bins should have a tightly fitting lid and be raised above ground so that area is easy to clean and metal bins are less likely to become messy.
7. Kitchen should be well ventilated to prevent humidity.
8. Good washing up facilities for example, a dish washer are essential as the high temperature of water sterilizes the dishes.
9. Use disinfectants regularly in sinks and drains.

Figure 2.5: Disinfecting kitchen workplace

Exercise 5.2

1. State the cleaning and sanitation procedures according to;
   i. personal hygiene
   ii. kitchen hygiene

5.5. SAFETY TECHNIQUES OF HANDLING FOOD

Learner's Activity 5.4

Using the raw freshly provided food, practice how to prepare, cook and serve this food following the safety techniques which include personal hygiene, equipment hygiene and place hygiene.

Food safety is the handling, storing and preparing food to prevent infection and help to make sure that our food keeps enough nutrients for us to have a healthy diet.

1. All the guidelines for personal hygiene should be emphasised and followed.
2. Direct handling of food should be avoided if possible particularly cooked food.

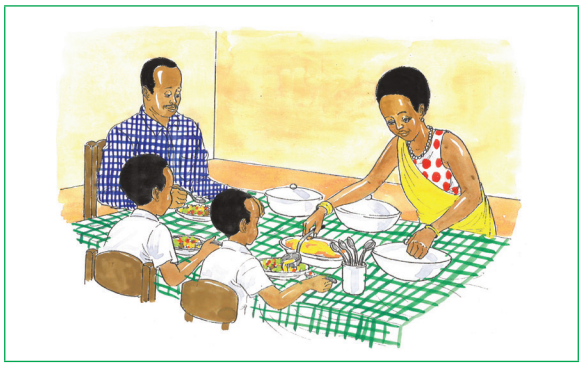


Figure 2.6: Serving food with a clean spoon is an element of hygienic food

3. Food should be covered to prevent contamination.
4. Equipment and utensils should be clean.
5. Cook food thoroughly and use clean water.
6. Hot food should be eaten while it is still hot.
7. If the food is to be eaten cold, it should be cooled rapidly and refrigerated within 90 minutes, cold food should be kept below 5 degrees in a refrigerator.
8. Cooked food should not be stored too long; up to 3 days in a refrigerator is maximum time. For longer storage, freezing is advisable.
9. It is not advisable to reheat food. Careful planning can minimise the problem of food leftover.
10. Avoid buying or eating food which is old. Check the expiry dates on food products and buy from clean shops.
11. Cook or reheat food properly, but avoid overcooking, because this can destroy nutrients.
12. Keep cooked and raw foods apart when preparing or storing them. This helps to prevent germs from moving from one to the other.

13. If you have a fridge, avoid keeping cooked food or raw meat for more than 24 hours unless it is in the freezer.
14. Do not keep food in metallic tins, which can get rusty. Rather keep the food in clean plastic containers with lids.
15. Keep food storage and preparation places clean and tidy.

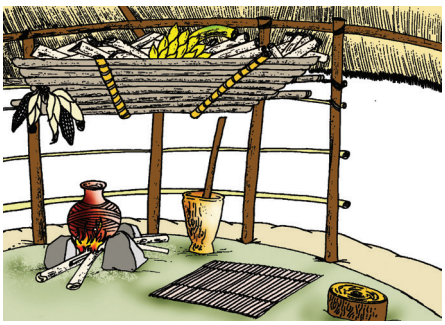


Figure 2.7: A well-organised kitchen helps to maintain good food hygiene

16. Wash dishes and utensils for example knives, spoons, and other items immediately after use and store them in a clean place where flies or dust can't get on them.
17. If you do not have a fridge, do not keep cooked food for more than a few hours in cool weather. In warm weather, eat it as soon as possible. To avoid waste, rather cook smaller amounts than cooking too much food which has then to be kept for too long or thrown away.
18. Do not eat cracked eggs. Wipe eggs clean with a clean, damp cloth before use, cook eggs until they are no longer runny.
19. Choose fruit and vegetables that are fresh and healthy looking and wash them in clean water before eating and cooking.

Figure 2.8: Fresh healthy fruits and vegetables

20. Food must be protected from flies, mice and domestic animals.
21. Avoid coughing and sneezing over food.

Exercise 5.3

Investigate ways of ensuring safety techniques of handling food.

5.6. APPROPRIATE HANDLING AND DISPOSAL OF GARBAGE

Learner's Activity 5.5

Visit the area where school kitchen garbage is collected and identify the different categories of household refuse.

Household refuse is waste material that has been thrown away.

Household refuse may be:

a) Organic that it has had life, for example dead flowers, stale food, leaves, vegetable peelings, scrapings and so on.

b) Inorganic, for example broken crockery, glass, tins, plastic, nylon, dust and so on.

It is important to dispose of household rubbish as quickly as possible because:

i. It attracts rats, lice and other insects which spread disease germs.

ii. Organic refuse decomposes rapidly and produces bad odour.

iii. Inorganic refuse left lying about looks unpleasant, takes up space and makes cleaning difficult. It is also causes accidents.

NOTE: Household refuse should be stored in dustbins which should be emptied or washed everyday. In cities or large towns, health authorities usually arrange for the collection and proper disposal of refuse. Rubbish is anything in the house or compound for which there is no use.

5.7. METHODS OF DISPOSAL OF HOUSEHOLD REFUSE

Learner's Activity 5.6

Discuss and make presentations on the methods of disposal of solid rubbish/ garbage. And thereafter, practice the methods of disposing of solid household refuse.

Disposal of solid rubbish

i. **Segregation** of waste such as glass, vegetable matter, plastic and paper that is, put the ones which can decompose alone and the ones that do not

decompose separate.

ii. **Burning:** refuse that does not rot should be burnt, e.g. rags, paper, pieces of wood;

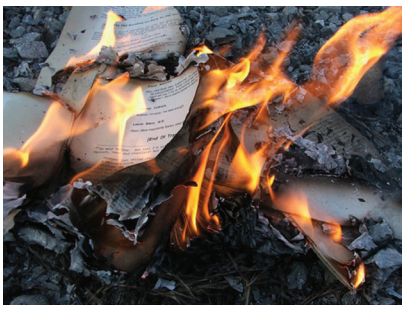


Figure 2.9: Burning of household refuse

iii. **Burying:** empty tins, broken plates, cups, buckets should be buried. If left lying about the compound these could collect rain water that would harbour mosquitoes. Plastic, nylon and any article of synthetic material should be buried.

Figure 2.10: Burying garbage in the ground

iv. **Composting:** some refuse makes good manure for the soil. Put it in a pit and allow it to rot, or dig it straight into the garden. Vegetable peelings, fruit skins, scraps of meat, tea leaves, egg shells, dead leaves and plants, ashes can all be buried in the compost pit.

Figure 2.11: Composting

v. **Using animal food:** scraps of food, bones and vegetable peelings may be useful for feeding animals such as cows, dogs, cats, pigs , goats and chickens. Scraps for animals should be put in a separate bin and kept covered, because if left uncovered they attract flies and rats which carry disease.

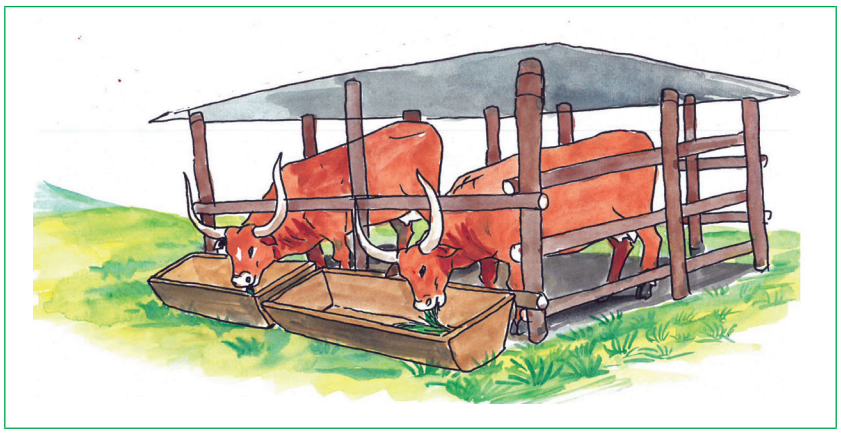


Figure 2.12: Using household refuse as animal feeds

vi. **Storing in a covered dustbin:** any rubbish which cannot be disposed of in any of these ways, inform the health authorities about such rubbish or waste water.

vii. **Recycling:** Recycling is an option for disposing of waste. The process involves reprocessing the raw materials and transforming them into similar or new products. Recyclable materials include; aluminium, glass, paper and plastic.

Figure 2.13: Recycled empty tins

Disposal of liquid refuse

In pairs, discuss the sources of liquid refuse and how it is disposed of.

Liquid refuse is water from the following;

a) Water from baths, sinks and wash basins.

b) Water used for washing up utensils, for scrubbing the floor and so on.

c) Water used for laundry.

d) Water from water closets.

e) Rain or storm water.

Most of the water is collected in gutters and carried away into either street drains or a soak pit. Water used for laundry may be sprinkled, in the compound to help keep down the dust. Water from toilets is flushed into the septic tank.

The refuse bin and its care

Learner's Activity 5.7

Bring buckets, dustbins with covers and practice how to care for them. Demonstrate how to line them.

- Every household should have at least two refuse bins. It is advisable to have a small covered bin in the kitchen to store kitchen refuse and sweepings and a large one outside to collect all the household and compound refuse.
- Galvanised iron bin round in shape with no crevices or corners and with a water-tight sloping lid is recommended.
- The refuse bin should preferably have handles for easy lifting.
- Polythene bins are cheaper and lighter to handle but are not as durable as galvanised iron bins.
- The bin should be easily accessible to the house.
- It should be kept covered so that flies, animals and rain cannot reach the contents.
- The bin should be lined with newspaper or polythene bag.
- Wrap all refuse before putting it into the bin.
- Never put liquid or anything wet into the bin, liquids quicken and fasten decay and cause smell.
- Empty the bin as often as possible to prevent flies from breeding in the refuse.
- Wash the bin frequently with hot soapy water. If necessary scour it with cold ash or an abrasive, rinse with a little disinfectant in the water and leave it to dry in the sun;

- The kitchen bin should be treated in the same way except that it is kept in the kitchen and should be emptied into the outside bin frequently during the day.

Exercise 5.4

1. Describe methods of disposing solid household refuse.
2. Mention examples of rubbish that needs to be disposed of by burning.
3. Where do we get waste water for disposing?
4. How do we dispose of waste water in the home?

Unit assessment

1. Define the following terms:
   i. food hygiene
   ii. food sanitation
   iii. food safety
2. Discuss in groups of 4 the importance of food hygiene at a workplace.
3. Mention hygiene procedures according to;
   i. personal hygiene
   ii. kitchen hygiene
4. Giving examples, classify household refuse.
5. Brainstorm the importance of disposing household refuse as quickly as possible.

Relating this to other subjects

This unit is related to other subjects like agriculture when teaching about disposal of refuse like composting and so on. It is related to Biology when we are talking about food hygiene and safety techniques.

UNIT SUMMARY

In this unit, we have looked at the importance of hygiene and sanitation at work place. Food hygiene procedures that involves cleaning and sanitation procedures and under this, we have covered how to do personal and kitchen hygiene. We also covered hygienic food handling procedures and appropriate handling and disposal of garbage and under this, we looked at disposal of solid rubbish, care of a dustbin and disposal of liquid refuse.

GLOSSARY

Abrasions: damaged areas of the skin where they have been rubbed against something hard and rough

Bin: a large container with a lid for storing waste

Detergent: a liquid or powder that helps remove dirt

Disinfectant: a substance that is used to disinfect

Freezing: extremely cold

Galvanise: to cover metal with zinc in order to protect it from rust

Germs: small living things that can cause infections and diseases

Hygiene: practice of keeping yourself, your living and working area clean in order to prevent illness and diseases

Inorganic refuse: waste material that had no life for example glass

Organic refuse: waste material that had life for example plants

Refuse: waste material that has been thrown away

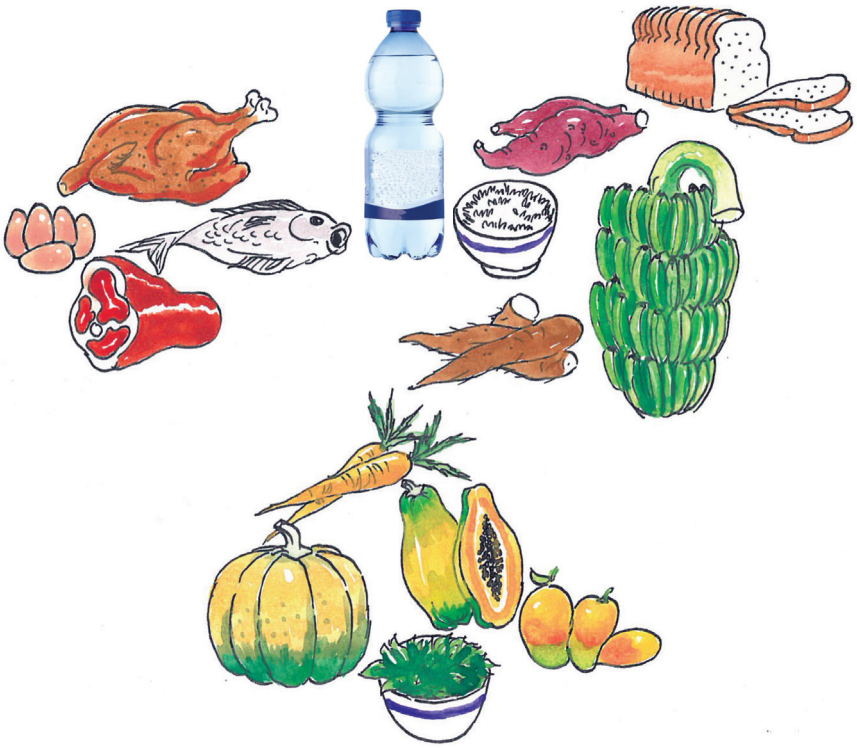
Unit 6

FOOD NUTRIENTS SELECTION PRINCIPLES

Learning objectives:

In this unit, I should be able to:

- analyse the types of food nutrients
- explain principles of food nutrients selection



Key unit competence: The importance of nutrient in food and use this knowledge in balanced food meal selection learner should be able to apply principles of food nutrient selection.

6.1. INTRODUCTION

When making food choices, there is need to follow guidelines, referred to as principles. We are reliably aware that food gives our bodies nourishment in multiple ways. So understanding and using nutrition to enhance wellbeing is indispensable to our day to day living.in this unit we shall fully understand the importance of food nutrients in our bodies, the sources of food and effect of excess and deficiency of such nutrients in our bodies.

6.2. THE NUTRIENTS

Learner's Activity 6.1

Discuss the importances of proteins in the body.

The food is any substance consumed to provide nutritional support for the body. It is usually of plant or animal origin, and food contains essential nutrients. The nutrients are used to produce energy, maintain life or stimulate growth.

6.3. TYPES OF FOOD NUTRIENTS

Food nutrients include macro and micro nutrients. Macro nutrients are needed by the body in large quantities. They include proteins, carbohydrates and lipids while the micro nutrients are needed in small amount and they include mineral salts and vitamins.

i. Proteins

Proteins are made of complex molecules which contain elements like oxygen, hydrogen, carbon, nitrogen and sometimes sulphur and phosphorous. The protein molecules are made up of small units called **amino acids** joined together like links in a chain.

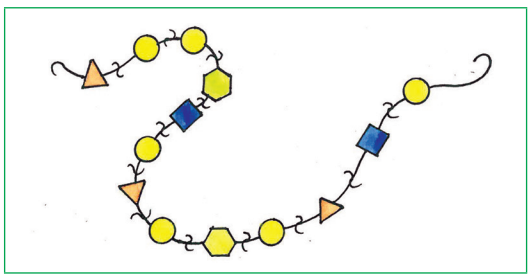


Figure 6.1: Chain showing different amino acids joined together to form a protein

There are 21 different amino acids and each has its own chemical name. Different proteins are made when different numbers and types of amino acids combine through a covalent peptide bond. Proteins are therefore known as **polypeptides.**

Examples of proteins are; collagen, myosin and elastin found in meat, caseinogen, lactalbumin, lactoglobulin found in milk, avalbumin, mucin and liporitellin found in eggs, glutein and gliadin in wheat, zein found in maize and hordenin found in barley.

The 21 different amino acids found in protein are;

Arginine	serine	selenocysteine	leusine
Histidine	threonine	glycine	methionine
Lysine	asparagine	proline	phenylalanine
Aspartic acid	glutamine	alanine	tyrosine
Glutamic acid	cystein	valine	tryptophan
Isoleucine			

Sources of proteins

Learner's Activity 6.2

(a) Identify the different foods rich in proteins, categorise and display them according to their source/origin.

After identifying foods rich in proteins and categorising them according to the their origins; I can note that proteins must be obtained from foods containing proteins in the diet because they cannot be made in the body. Therefore the foods which contain proteins include:

Animal foods like; meat, cheese, fish, milk, eggs, chicken, mutton, pork.

Figure 6.2: Animal sources of proteins

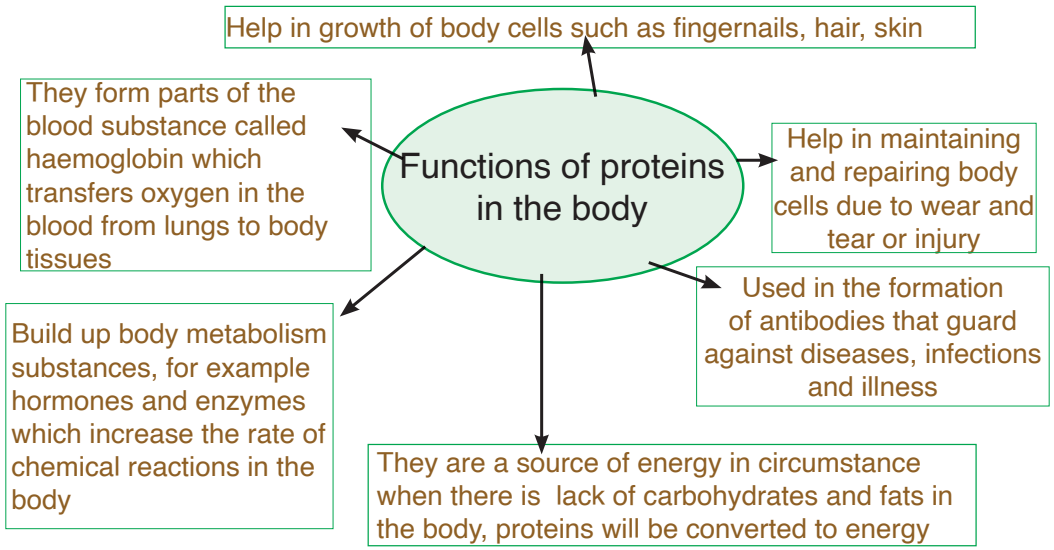
Plant foods like:

Pulses for example peas, beans, lentils, soya beans

Nuts like groundnuts, sesame seeds (simsim), cashew nuts, almond nuts and so on.

Figure 6.3: Plant sources proteins

Functions of proteins



Excess of proteins

1. Excess proteins in the body lead to surplus of energy in the body, and this may lead to obesity.

Deficiency of proteins

Deficiency of proteins leads to;

1. retardation of growth especially in children.
2. less resistance to diseases.
3. malfunctioning of the body organs and systems.
4. body wastage because the worn out cells and tissues are not replaced.
5. in severe cases of protein deficiency kwashiorkor arises.

Figure 6.4: Health child

Figure 6.5: Child suffering from kwashiorkor

Exercise 6.1

1. Mention the chemical elements that make up proteins.
2. Define amino acids.
3. Discuss the function of proteins
4. In groups of five, display the food sources rich in protein.
5. Investigate the effects of protein deficiency.

ii. Carbohydrates

There are several types of carbohydrates but they all contain three elements that is, carbon, oxygen and hydrogen. Oxygen and hydrogen are present in the same proportion as water (H_2O) hence the name hydrates. Carbohydrates are the major sources of energy for the body.

Functions of carbohydrates

1. Carbohydrates are a source of energy used as they provide glucose that is used in the brain and cells.
2. Carbohydrates are used as a 'protein sparer' so that proteins are used for it's main functions rather than a source of energy because when carbohydrates are not provided in the body, the proteins available are broken down to provide energy.
3. Carbohydrates add bulk or roughage to the food which helps in digestion for example, cellulose in cassava.
4. Carbohydrates provide warmth or heat to the body.

Learner's Activity 6.3

Research and discuss the functions, food sources, effect of excess and deficiency of carbohydrates in the body. Present your work to the rest of the class.

Sources of carbohydrates

Carbohydrates are mainly produced by plants during the process of **photosynthesis**.

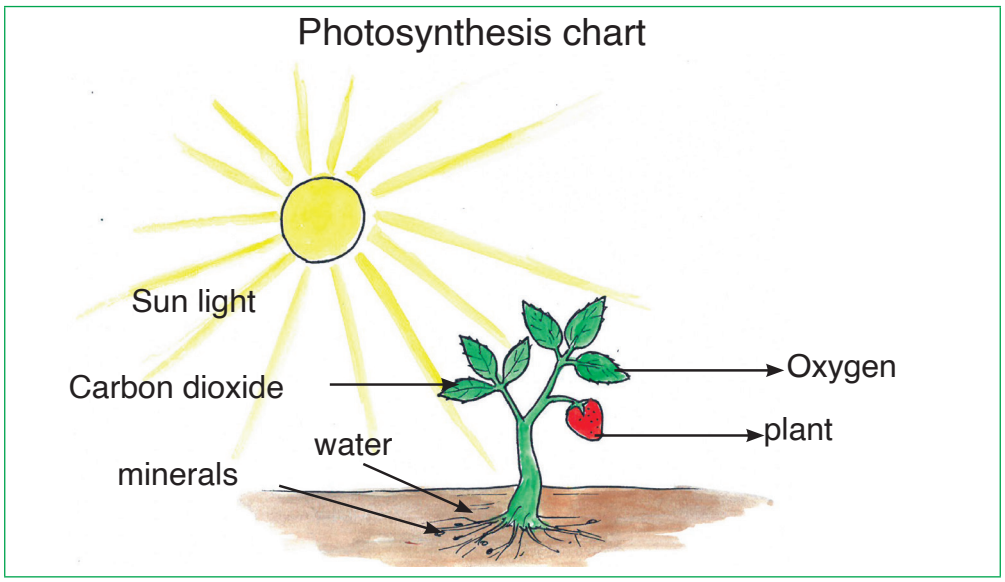


Figure 6.6: Photosynthesis

$$6CO_2 + 6H_2O \xrightarrow{\text{energy from sunlight}} C_6H_{12}O_6 + 6O_2$$

Carbon dioxide water carbohydrates oxygen

Foods with carbohydrates include: cassava, yams, maize, rice, wheat, bananas, pineapple, oats, sorghum, millet, potatoes and so on.

Excess of carbohydrates

Excess intake of carbohydrates leads to:

1. **Obesity:** When there is a lot of sugar in the body, the excess sugar is converted to fat and this fat is kept in the fat deposits. When the fat is not used for energy production, it leads to overweight and this condition is known as **obesity**.
2. **Dental decay;** where the sugars first deposited on the enamel of the tooth and later fed on by bacteria which eat up the enamel as well thus leading to dental decay.

3. **Chronic heart disease**; This is due to too much sugar in the blood and this leads to high blood pressure with it's associated problems such as heart attack, heart failure and stroke.

Deficiency of carbohydrates

Deficiency in carbohydrates causes;

1. **marasmus** which is as a result of breakdown of body proteins and body tissues to provide energy in the body.

Figure 6.7: Health child

Figure 6.8: Child suffering from marasmus

2. weight loss
3. dry scaly skin.

Exercise 6.2

1. Why does the body require carbohydrates?
2. Mention the chemical elements that make up carbohydrates.
3. Investigate the effect of too much carbohydrates eaten in the diet.
4. Mention the foods rich in carbohydrates.
5. Evaluate the symptoms of deficiency of carbohydrates.

iii. Lipids

Learner's Activity 6.4

Discuss the meaning of lipids and their functions.

Fat sometimes 'lipids' refers to both fats and oils. Where by fats and oils have the same basic chemical structure but their appearance differs at room temperature that is, fats are solids at room temperature while oils are liquids at room temperature.

Fat is composed of three elements which are carbon, oxygen and hydrogen.

Functions of lipids

- Fats are a source of energy. They supply energy to the body more than carbohydrates and proteins.
- Fat surrounds and protects important organs of the body such as the kidney and the heart, however too much fat around the organs is dangerous as it slows down their functioning.
- Fat forms an insulating layer beneath the skin to help keep us warm by preserving body heat and it also protects the skelton and organs.
- Fat provides a source of fat soluble vitamins **A, D, E** and **K** in the body.
- Fat is a reserve of energy for long term storage and can be used if energy intake is restricted.
- Fat in foods provides texture and flavour in foods and it helps to make it palatable.
- Food containing fat provides a feeling of satiety or fullness after a meal as fat is digested slowly.

Sources of lipids

Fats and oils are obtained from both the plants and animals. And fat is present in food either as visible fat or invisible fat.

Visible fat is the one that is easily seen or detected in food for example; fat in meat, butter, margarine, lard, suet and cooking fat and oil.


meat


cheese


cooking oil

lard


margarine

Figure 6.9: Examples of visible fat

Invisible fat is the part of food that is not easily seen for example fat with in lean meat, egg yolk, flesh of oily fish, groundnuts, soya beans, avocado and fat found in prepared foods, for example, pastry, cakes, biscuits, French fries, pancakes, croquettes.

meat pie

pan cake

cake

French fries

Figure 6.10: Examples of food with invisible fat

Learner's Activity 6.5

Let students in pairs identify more sources of visible and invisible fats. A member will present answers to the rest of the class.

Importance of using fat in cooking

- **Frying:** It is the quickest method of cooking because fats can raise very high temperatures without boiling.
- **Flavouring:** Fats improve the flavour of many foods, for example, scones, cakes and so on.
- **Vitamins:** Fats add food value to foods, for example,margarine adds vitamin **A, D, E** and **K** to the diet.
- **Anti-staling:** Qualities and long lives of bread and cakes are also improved by fats.
- **Creaming:** This is seen in cake making by the creaming method. The fat traps air around themselves during this method and this air acts as a raising agent.
- **Shortening:** Fats give a water proof layer to grains of flour when used. This shortening property is used in pastry.

Effects of excess fat in the body

- Excess fat leads to obesity (overweight).

Figure 6.11: An obese boy and girl

- People who are obese are more likely to get diabetes, cancer and depression.
- Excess fat can cause stroke which occurs when the blood flow to a part of the brain is severely reduced or interrupted.
- Excess fat may also result in cardio vascular diseases for example heart attack and heart failure.

Effects of deficiency of fat in the body

Deficiency of fat leads to:

- There is a general deficiency of fat soluble vitamins, for example, **A,D,E** and **K** which leads to the development of deficiencies of these vitamins because the body absorbs these vitamins in the presence of fat. Vitamin **A** deficiency symptoms include dry skin, night blindness, increased exposure to diseases and infections and development, then deficiency of Vitamin **D** can cause soft and weak bones and too little vitamin **K** will lead to increased bleeding.
- The skin becomes dry and scaly rash develops, this makes it harder for wounds to heal.

Exercise 6.3

1. Describe the functions of fat in the body.
2. Investigate the difference between fats and oils?
3. Mention the chemical elements that make up fat.
4. Outline four animal and four plant sources of fat.
5. Analyse the difference between visible and invisible fat.
6. Discuss the effect of excess fat intake.

iv. Vitamins

Vitamins are a complex organic substance which are usually obtained by the body from food. They do not produce energy therefore have no caloric value. Vitamins are required by the body in very small amounts but if these are not included in the diet, various deficiency diseases will occur.

Learner's Activity 6.6

Categorise vitamins while giving examples.

Classification of vitamins

Fats are divided into two on the basis of solubility that is fat-soluble vitamins and water-soluble vitamins.

Fat-soluble vitamins

As the name suggests, these vitamins are absorbed along with fats, they are also found in fatty foods. Examples are vitamin **A,D,E** and **K**, these vitamins are fairly more stable to high temperatures. Therefore, they are not lost during cooking and they do not dissolve in cooking water.

Water-soluble vitamins

These dissolve in water and are easily lost during cooking in liquids. They are destroyed by high temperatures and sun rays. Examples of water soluble vitamins are; vitamin B complex which has (**B_1**- thiamine, **B_2**- riboflavin, **B_3**- nicotinic acid, **B_6**, - pyridoxine, **B_{12}**-cobalamine) and vitamin C-ascorbic acid.

Learner's Activity 6.7

(a) Display foods rich in each vitamin.

(b) Prepare a chart showing deficiency diseases of all vitamins and pass them around for everybody to see.

FAT SOLUBLE VITAMINS

Vitamin A (retinol)

Functions of vitamin A

- Essential for growth in children.
- It helps in vision or eye sight.
- Increases body resistance to diseases.
- Necessary for healthy skin and glands.

- Helps in teeth and bones formation.
- Keeps the nose and membranes moist like eyes, throat and digestive system.

Food sources of vitamin A

Carrots, pumpkins, pawpaws, chilies, tomatoes, spinach, milk, eggs, jackfruit, liver, oily fish, butter, margarine

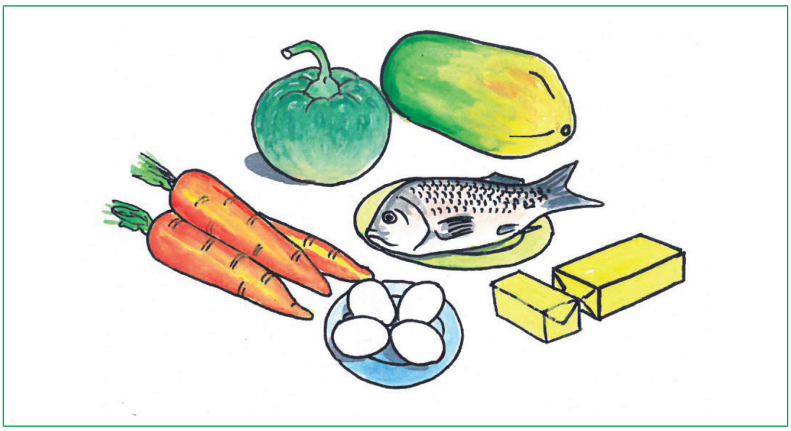


Figure 6.12: Foods rich in vitamin A

Deficiency of vitamin A.

- Night blindness.

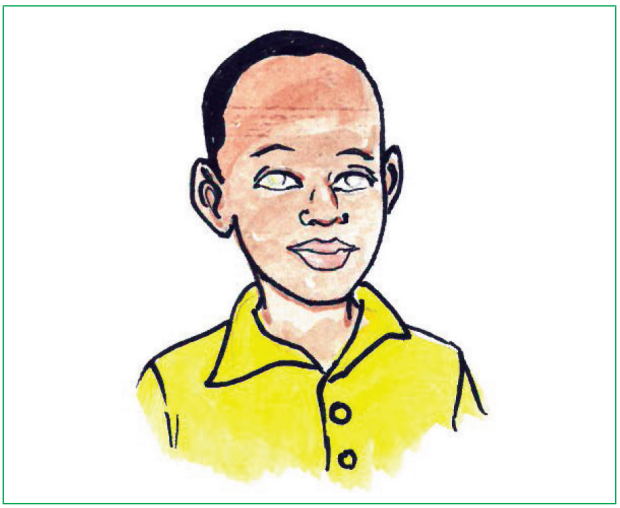


Figure 6.13: Night blindness due to lack of vitamin A

- Skin infection.
- Retarded growth in children.
- Poor resistance to infections like cough and flu.

Properties of Vitamin A

- Soluble in fat.
- Insoluble in water.
- Not destroyed in ordinary cooking.
- Destroyed if fat turns rancid(goes bad).

Vitamin D- cholecalciferol

Functions of vitamin D

- Required for the proper formation of bones and teeth.
- Helps the body to absorb minerals that is calcium and phosphate, where by after digestion these minerals are absorbed from small intestines into the blood, which takes them to the bones and teeth.

Sources of food rich in vitamin D

Liver, fish liver oils, oily fish, egg yolk, fortified margarine, milk and dairy products, sunlight is also an important source when the skin is exposed to sunlight.

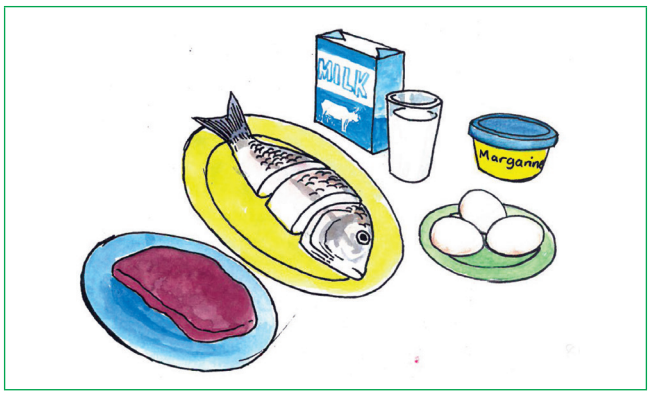


Figure 6.14: Foods rich in vitamin D

Learner's Activity 6.8

(a) Display foods rich in vitamin D.

(b) Prepare a chart showing diseases that are caused by deficiency of vitamin D.

Effects of deficiency of vitamin D

- Absorption of calcium and phosphorus is reduced thus leading to weak bones and teeth.
- Failure to absorb calcium and phosphorus to the blood and bones leads to rickets in children and osteomalacia in adults.

Figure 6.15: A child with rickets

- Growth in children is retarded.
- Leads to dental decay.

Properties of vitamin D

- It is not affected by normal cooking temperatures and processes.
- It does not dissolve in water.
- Not destroyed by sunshine.
- Soluble in fats.

Vitamin E-tocopherol

Functions of vitamin E

- Is an effective antioxidant that protects fatty acids from damage especially in the cell membrane in the body.
- It is an antioxidant used in food industry to stop fat from becoming rancid.
- Helps in normal metabolism of the body.
- Very significant in fertility.

Learner's Activity 6.9

Display foods rich in vitamin E.

Sources of food rich in vitamin E

Lettuce, peanuts, soya beans, vegetable oil, egg yolk, milk and milk products.

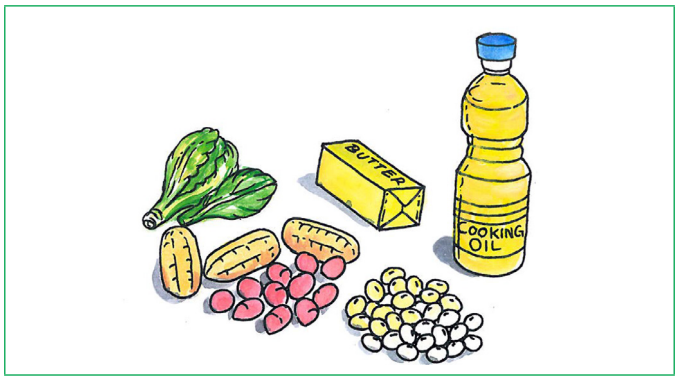


Figure 6.16: Foods rich in vitamin E

Effects of deficiency of vitamin E

- Miscarriages.
- Premature births.

Properties of vitamin E

- It is fat soluble.
- Not lost during cooking.
- Cannot be destroyed by sunshine.

Vitamin K

Functions of vitamin K

Helps in the clotting of blood therefore essential during times of injury or high bleeding like accidents, operations/surgeries.

Learner's Activity 6.10

Display foods rich in vitamin K.

Sources of food rich in vitamin K

Widely distributed in foods especially the leafy vegetables like spinach, pumpkin leaves, *sukuma wiki*, lettuce, liver, fish, eggs, milk.

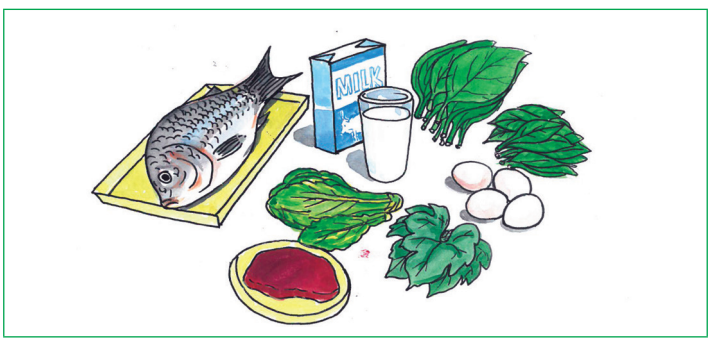


Figure 6.17: Foods rich in vitamin K

Effects of deficiency of vitamin K

Deficiency leads to continued bleeding and inability of blood to clot may lead to death.

Properties of vitamin K

- It is fat soluble
- Not lost during cooking
- Cannot be destroyed by sunshine.

WATER SOLUBLE VITAMINS

Vitamin B_1-thiamine

Functions of vitamin B_1

- Releases energy from carbohydrates and fats.
- Promotes growth in children and general health.
- Required for the function and maintenance of the nerves.

Learner's Activity 6.11

Display foods rich in vitamin B_1.

Sources of food rich in vitamin B_1

Yeast products like bread, cereals, especially whole grain cereals, kidney, all meats pork, milk, fish, and liver.

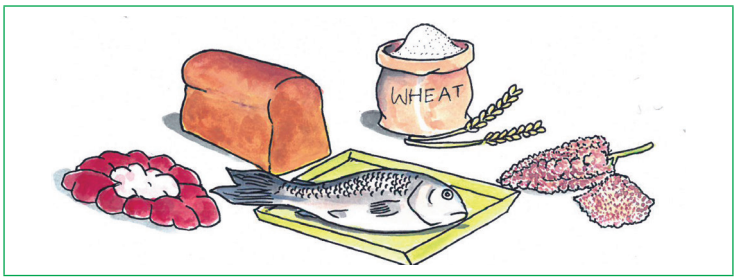


Figure 6.18: Foods rich in vitamin B_1

Deficiency

- Depression, irritability.
- Difficulty in concentration
- Defective memory
- Anxiety
- Growth retardation in children.
- Muscles become weak.

- Severe deficiency leads to beriberi.
- It has symptoms such as: excessive weight loss, the legs, ankle and writes drop)

Properties of vitamin B_1

- soluble in water.
- It's lost during cooking.
- It is destroyed by sunshine.

Vitamin B_2-riboflavin

Functions of vitamin B_2

- Releases energy from fats and carbohydrates.
- Works together with vitamin **C** to form materials which bind cells together.
- Essential for normal growth.

Learner's Activity 6.12

a. Prepare a chart with foods rich in vitamin B_2.

b. Display foods rich in vitamin B_2.

Sources of food for vitamin B_2

Yeast and yeast products, liver, kidney, spinach, pork, whole grain cereals and so on.

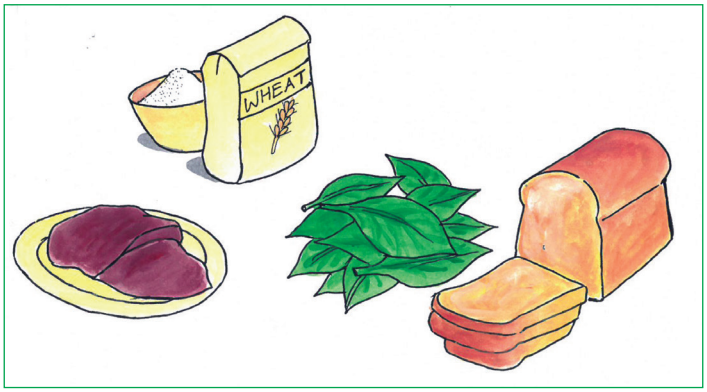


Figure 6.19: Foods rich in vitamin B_2

Effects of deficiency of vitamin B_2

- Failure to grow.
- Skin lesions, skin disorder and conjunctivitis (disorder of the outer membrane of the eye).
- Tongue may swell, mouth and lips become sore.

Figure 6.20: Sore lips and mouth

Properties of vitamin B_2

- Soluble in water.
- It is lost during cooking.
- It is destroyed by sunshine.

Vitamin B_3-niacin or nicotinic acid

Functions of vitamin B_3

- Helps in the release of energy from foods especially carbohydrates by oxidation.
- It helps in the formation of blood hence preventing anaemia.

Sources of foods for vitamin B_3

Whole grain cereals, green beans, potatoes, dark green leafy vegetables.

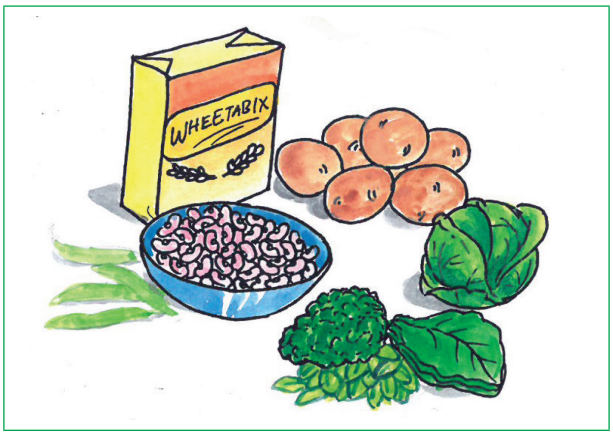


Figure 6.21: Foods rich in vitamin B_3

Effects deficiency vitamin B_3

Deficiency results in pellagra which has the following symptoms:

- Dermatitis which is cracking and flaking of the skin that is exposed to sunlight.

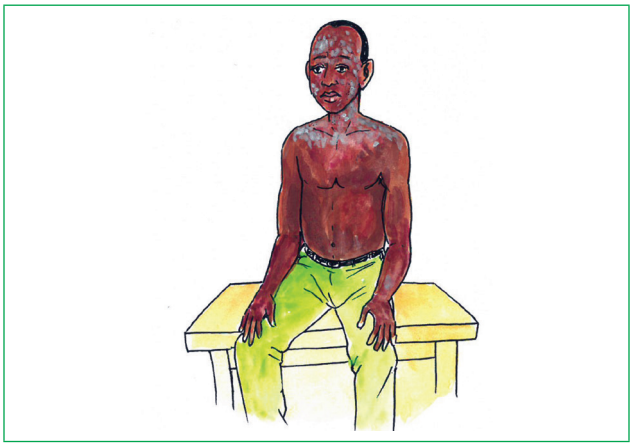


Figure 6.22: A person with dermatitis

- Dementia which is loss of memory, confusion and depression.
- Diarrhoea, abdominal discomfort, loss of appetite, loose and frequent stools.

Properties of vitamin B_3

- Soluble in water but is resistant to heat, oxidation and alkalis.
- It is the most stable vitamin in the B complex in normal cooking processes.

Vitamin B_6- pyridoxine

Functions of vitamin B_6

- Helps in prevention of anaemia.
- Helps in the formation of red blood cells.
- Acts as a co-enzyme factor for release of energy from foods.

Sources of foods rich in vitamin B_6

Meat, whole grain cereals, dry beans, potatoes, dark green leafy vegetable.

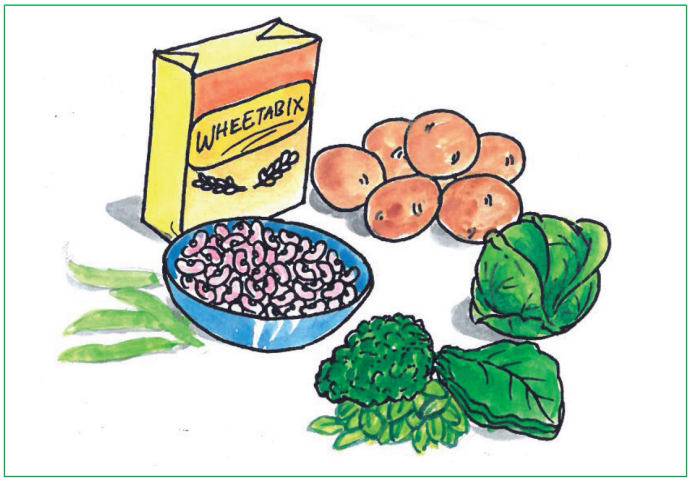


Figure 6.23: Some foods rich in vitamin B_6

Effects of deficiency

- Loss of energy
- Pernicious anaemia.

Properties of vitamin B_6

- Soluble in water.
- It is destroyed by sunshine.
- It is lost during cooking.

Vitamin B_9-folate

Functions of vitamin B_9

Helps in the formation of red blood cells.

- Essential for normal growth.
- Required in the release of energy from foods.
- Required in production of nucleic acids RNA and DNA.

Learner's Activity 6.13

Display foods rich in vitamin B_9.

Sources of food rich in vitamin B_9

Whole grain cereals, liver, dry beans, dark green leafy vegetable, meat, potatoes, okra, pulses, dairy products, oranges, bananas, fish, peas, yeast extracts and so on.

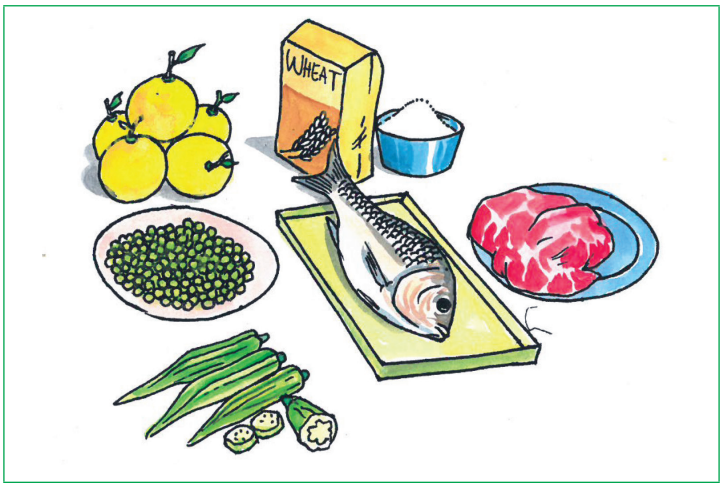


Figure 6.24: Foods rich in vitamin B_9

Effects of deficiency of vitamin B_9

Failure to grow normally.

- **Megaloblastic aneamia** where the red blood cells become enlarged and cannot give their oxygen properly to the body cells.
- A deficiency in early pregnancy may lead to a condition called **spin.**

Bifida in a baby which causes permanent disability.

- Poor growth.
- Tongue inflammation.
- Loss of appetite.
- Shortness of breath.
- Diarrhoea.
- Irritability.
- Forgetfulness.

Properties of vitamin B_9

Folate is soluble in water and is destroyed by prolonged cooking.

Vitamin B_{12}-cobalamine

Functions of vitamin B_{12}

It is required in the metabolism of amino acids as well as other enzymes throughout the body.

- Controls genetic make-up of cells.
- Formation of red blood cells.

Sources of food rich in vitamin B_{12}

Meat, poultry, shellfish, kidney, eggs, and dairy products.

Effects of deficiency of vitamin B_{12}

Deficiency causes megaloblastic aneamia where the red blood cells become enlarged and cannot give their oxygen properly to the body cells.

- Loss of energy.

Properties of vitamin B_{12}

- Soluble in water.
- It is lost during cooking.
- It is destroyed by exposure to sunshine.

Vitamin C ascorbic acid

Functions of vitamin C

- Helps in the prevention of scurvy and skin diseases.
- Assists in building of strong bones and teeth.
- Helps in the absorption of iron from small intestines during digestion.
- Required in the production of blood and the walls of blood vessels.
- Required for the building and maintenance of the skin and linings of the digestive system.
- It is required to make connective tissues which binds the body cells together thus helping in quick healing of wounds.

Learner's Activity 6.14

Display foods rich in vitamin C.

Sources of food rich in vitamin C

Found mainly in fresh fruits and vegetables for example, citrus fruits like oranges, tangerine, lemons, limes, strawberries and guavas, papayas, tomatoes, green vegetables, spinach, broccoli, cabbage.

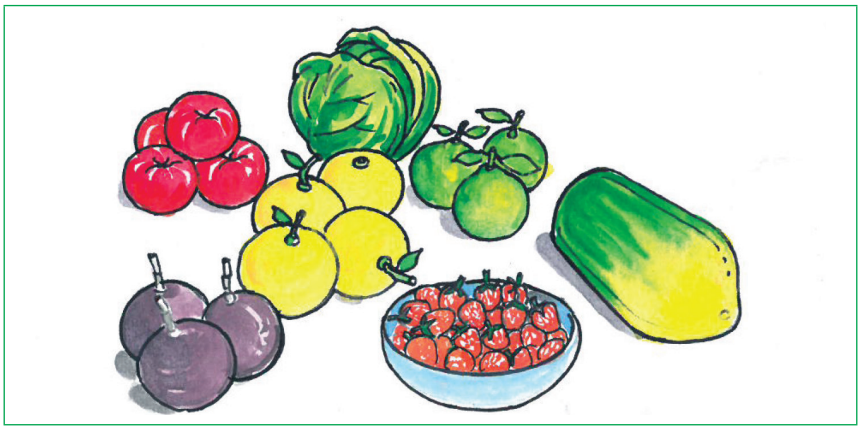


Figure 6.25: Foods rich in vitamin C

Effects of deficiency of vitamin c in human body

- Pain in muscles and joints, bleeding of gums and loss of teeth a condition called **scurvy**

Figure 6.26: A person with scurvy

- Loss of weight, fatigue.
- Connective tissue not made or well maintained.
- Walls of the blood vessels weaken and break in places then blood escapes and appears as small red spots under the skin (haemorrhages).
- Cuts and wounds fail to heal properly.
- Scar tissues may weaken and break open.

- Aneamia because iron is not absorbed properly without vitamin C.

Properties of vitamin C

- It is soluble in water.
- It is lost during cooking.
- It is destroyed by exposure to air and sunshine.
- It is quickly and easily destroyed by the presence of alkali such as bicarbonate of soda which causes vitamin C to be oxidised.

Exercise 6.4

1. Mention the vitamins in the B complex group.
2. Describe the functions and the food sources of three of the B vitamins.
3. Discuss the symptoms of beriberi and how it is caused?
4. Investigate the symptoms of deficiency of riboflavin?
5. Why is folate important in pregnancy?
6. Mention the causes of pellagra.
7. Evaluate the functions of vitamin C and list its main sources.
8. Discuss the symptoms of a deficiency of vitamin C and name the disease associated with it.

v. Mineral salts

Mineral salts are essential organic food elements that are required for;

- building the body especially bones and teeth such as calcium and phosphorus.
- the formation of body fluids for example sodium, iron in blood.
- Influence of body chemical reactions like in metabolism we need iron, magnesium and phosphorus.
- for the formation of the soft body tissues, for example potassium and phosphorus in the muscles and liver.

Groups of mineral Salts

There are two groups of mineral salts;

1. Major mineral Salts

These are mineral elements that are required in the body in relatively large amounts. They are easily absorbed and easily excreted. These include: Calcium(Ca), Phosphorus(P), Iron(Fe), Sodium(Na), Potassium(K), Chlorine(Cl),

Magnesium(Mg), Sulphur(S).

2. Trace mineral elements or minor mineral elements

These mineral salts are required in the body in smaller amounts. These minerals are difficult to absorb yet are poorly excreted. Examples are: Iodine(I), Fluorine(F), Copper(Cu), Manganese(Mn), Cobalt(Co), Zinc(Zn), Nickel(Ni), Chromium(Cr), Selenium(Se).

Learner's Activity 6.15

Discuss the symptoms of anaemia and rickets.

Calcium(Ca)

Functions of calcium in the body

- With phosphorous, it helps in the formation of strong bones and teeth.
- Helps in normal clotting of blood.
- Required for the correct functioning of the muscles like the heart and the nervous system.
- Required for the maintenance of bones and teeth once formed.

Effects of deficiency of calcium in the body

- Rickets in children and osteomalacia in adults.

Figure 6.27: Osteomalacia in adults

- Poor quality teeth.
- Weak bones.
- Poor clotting of blood.
- Muscle spasm where muscles and nerves do not function properly resulting into tetany.

Effects of excess of calcium in the body

Excess calcium(ca) leads to hypercalcemia characterised by loss of appetite, aneamia, thirst, diarrhoea, constipation and headache.

Figure 6.28: Loss of appetite

Sources of foods rich in calcium

Milk, cheese, vegetables, hard water, egg shells, whole grain cereals, fish eaten with bones and green vegetables.

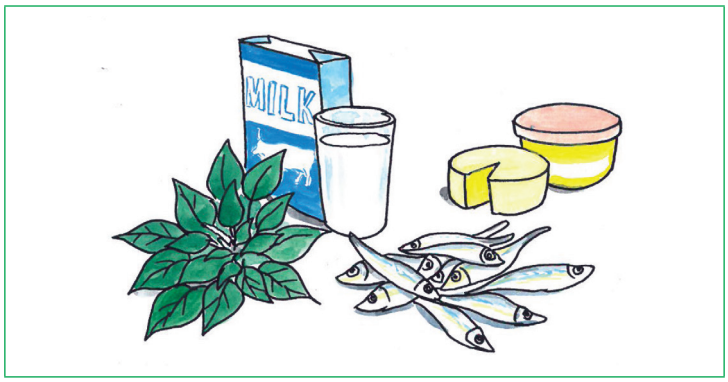


Figure 6.29: Foods rich in calcium

Iron(Fe)

Functions of iron

- It helps in the formation of heamoglobin the substance which gives red blood cells the colour. Heamoglobin is required for the transportation of oxygen around the body to every cell.

Effects of deficiency of iron in the body

- Heamogoblin is not made properly so insufficient oxygen is carried to the body and this leads to fatigue, weakness and pale complexion and this is called iron deficiency.

- Aneamia.

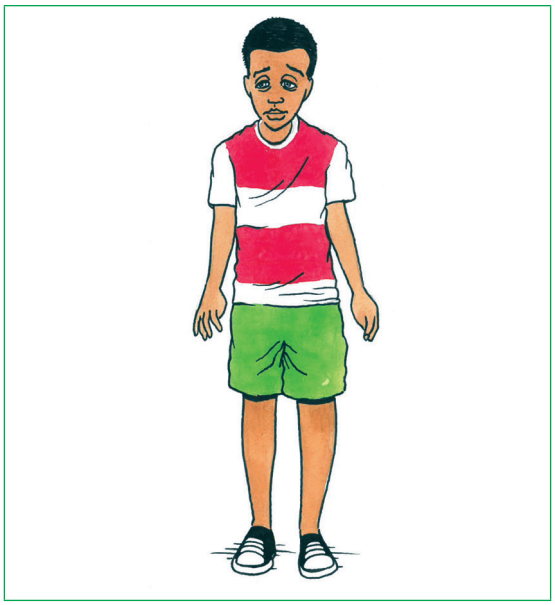


Figure 6.30: Aneamic eye

- Brittle nails.
- Sore tongue.
- Sore throat.
- General health is affected and cells cannot function properly.

Effects of excess iron in the body

Excess is stored in the body and it forms poisonous stores especially in the liver, heart and pancreas. This leads to eye threatening conditions like liver disease, heart problems and diabetes.

Figure 6.31: Health liver

Figure 6.32: Diseased liver

Sources of foods rich in iron

Learner's Activity 6.16

Display foods rich in iron.

Liver, kidney, heart, red meat, cocoa, plain chocolate, eggs, cabbage, pumpkin, leaves, spinach (green leafy vegetables), whole grain cereals and so on.

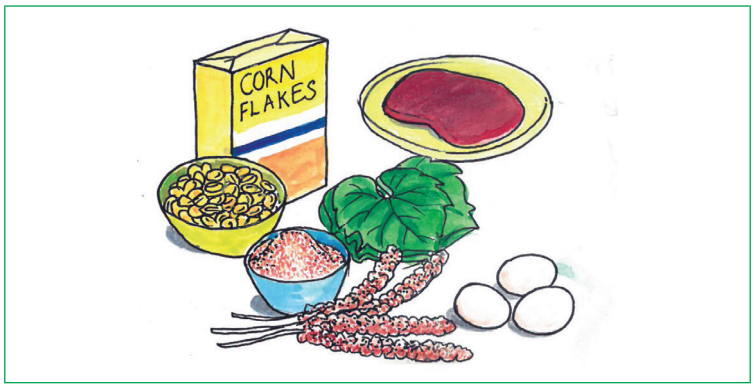


Figure 6.33: Some foods rich in iron

Phosphorous(P)

Functions of phosphorous in the body

- Works with calcium to form strong bones and teeth.
- Essential for the production of energy in the body.
- Acts as a buffer as it helps in neutralising of body fluids.

Effects of deficiency of phosphorous in the body

Causes bone diseases.

Effects of excess phosphorous in the body

- Causes reduction in calcium absorption thus leading to the effects of calcium deficiency.
- Fragile muscles(soft and weak)

Sources of food rich in phosphorous

Fish, milk, meat, cheese, eggs, spinach, cabbage, peas, whole bread, cereals.

Potassium(K), sodium(Na) and chloride(Cl)

Functions of sodium, potassium and chloride in the body

- Regulate water content in the body
- All these are required for the correct concentration of body fluids

- Chloride is also required for the production of hydrochloric acid in the gastric juices of the stomach which is important in digestion.

Effects of deficiency of sodium, potassium and chloride in the body

- Mental confusion.
- Weak muscles.
- Lack of sodium causes exhaustion hence reduction in body fluids.
- Less appetite.
- Blood pressure.
- Muscle cramps.
- Sudden death may occur.

Effects of excess of sodium, potassium and chloride in the body

- Kidney failure
- Heart failure
- Shock
- Weak muscles
- Oedema occurs which is the accumulation of fluids around cells hence swelling of body parts.

Figure 6.34: A child suffering from oedema

Sources of food rich in sodium, potassium and chloride

Yeast products, fish, potatoes, mushrooms, liver, beef, cauliflower, all grains, common table salt, baking powder, yeast, salty fish, cheese, bacon, root vegetables.

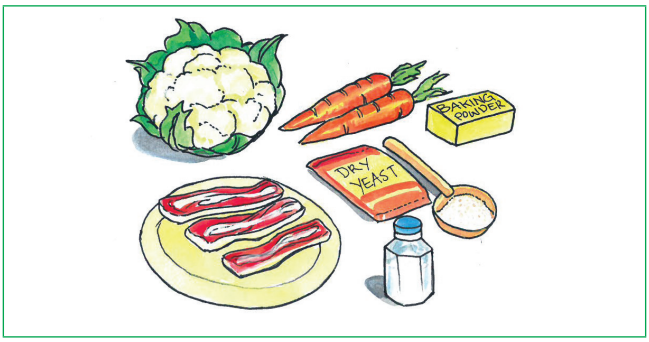


Figure 6.35: Foods rich in potassium, sodium and chloride

Learner's Activity 6.17

1. Display food items rich in the following minerals.

(a) Calcium (b) Phosphorus (c) Iodine

Iodine(I)

Functions of Iodine

- Is required to make the hormone thyroxine which is produced by the thyroid gland in the neck, thyroxine along with other hormones help to control the rate of metabolism in the body.

Effects of deficiency of iodine

- It leads to a swelling of the thyroid gland in the neck called goitre.

Figure 6.36: A woman with goitre

- Fall in the metabolic rate hence lack of energy.
- Cretinism may arise.

Effects of excess of Iodine

High intake causes the same symptoms as iodine deficiency including goiter.

Sources of food rich in Iodine

Sea foods, milk, green vegetables especially spinach, iodised table salt, drinking water.

Fluorine(Fl)

Functions of fluorine

- It is important for strengthening teeth against decay, it combines with protective enamel coating of the teeth, making them more resistant to attack by acids produced by bacteria in the mouth.

Effects of deficiency of fluorine

Tooth decay.

Effects of excess of fluorine

Teeth become rough and brown.

Sources of food rich in fluorine

Naturally found in tea, sea water fish, sea foods and fluorinated water.

Figure 6.37: Foods rich fluorine

iv. Water

Learner's Activity 6.18

Discuss the functions of water in our bodies.

Water with a chemical formula [H_2O] is a transparent fluid which is the major constituent of the fluids of organisms.

Water is an essential nutrient because its required in many biochemical reactions.

Functions of water in our body

1. Water helps to carry and distribute essential nutrients to cells such as minerals, vitamins and glucose.
2. Water removes waste products in the body through urine and feaces.

3. Water helps in digestion where by it enables food to be chewed, swallowed and to break it down into its smallest particles in the body.
4. Water helps to regulate body temperature where by when the temperature is higher than the body temperature the body releases heat by perspiration and when the outside temperature is lower than the body temperature, the body begins to sweat and the evaporation of water from the skin surface cools the body.
5. Water acts as a lubricant around the joints and its also a shock absorber for eyes, brain, spinal cord and the foetus through the amniotic fluid.
6. Water helps to prevent constipation.

Food sources of water.

- Water is got from the food that we eat.
- We get water from liquid foods and beverages like tea, coffee, soda, drinking water and juices.

Figure 6.38: Drinking water

Figure 6.39: Juice

Figure 6.40: Tea

Effect of water in the body.

Too much water intake that is more than the kidney can get rid of in the urine causes too much water to collect in the body thus causing an imbalauce between water and sodium in blood and thus will result in:

- Liver diseases
- Kidney problems
- Congestive heart failure.
- Syndrome of inappropriate anti-diuretic hormone(SIADH)

Effects of deficiency of water in the body

Deficiency of water in the body leads to dehydration of the body and this is seen through:

- Decreased sweating.
- Producing less urine.

- Thirst or drying of the throat.
- Dry mouth.
- Dry skin.
- Getting headache.

Figure 6.41: Boy and girl with headache due to lack of water

- Fainting.
- Fall in blood pressure and results in shock.
- Severe damage to many internal organs like kidney, liver and brain.

Exercise 6.5

1. Mention the five mineral elements needed in large amounts and five minerals needed in trace amounts.
2. Analyse the functions of calcium, iron, sodium, chloride, iodine, and fluoride and give their main food sources.
3. Describe the function of haemoglobin and which mineral element is connected with it.
4. Why do women, babies, and people recovering from injuries require extra iron?
5. Describe is goitre and it's causes.
6. Give the meaning of osteomalacia?

6.4. PRINCIPLES OF FOOD NUTRIENT SELECTION

Learner's Activity 6.19

Plan a balanced meal that has all the following nutrients; proteins, carbohydrates, vegetables, minerals and vitamins.

The principles of food nutrient selection vary widely from individual to individual and they are according to;

1. Growth or age of a person

Whereby young children require more energy for their size than adults as they are growing rapidly and tend to be very active most of the time. With increasing age, the need for energy decreases partly due to a slowing down of the body and also due to reduced physical activity.

2. Physical activity level or occupation

The amount of energy people use depends on their occupation or physical activities so the less active one is the less energy required whereas the more active one is, the more energy required by that person. Physical activities are as follows:

Sedentary life style; these include office workers, drivers, pilots, clergy, type setters, shop attendants, book writers or authors, lawyers, doctors, architects and so on.

Figure 6.42: Sedentary life style requires less energy

Active lifestyle; People living an active lifestyle include; industrial workers, railway workers, plumbers, bus conductors, builder's, labourers, farmers, army recruits, forestry workers, miners.

Figure 6.43: Active lifestyle requires alot of energy

3. Pregnancy and state of body

During pregnancy, extra nutrients are required for the growth of the baby and the adjustment of the mother's body to pregnancy, during lactation, extra energy is required for the production of milk.

During illness, the metabolism of the body may be raised at times due to the illness or fever, but at other times may be lowered due to the reduction in physical activity.

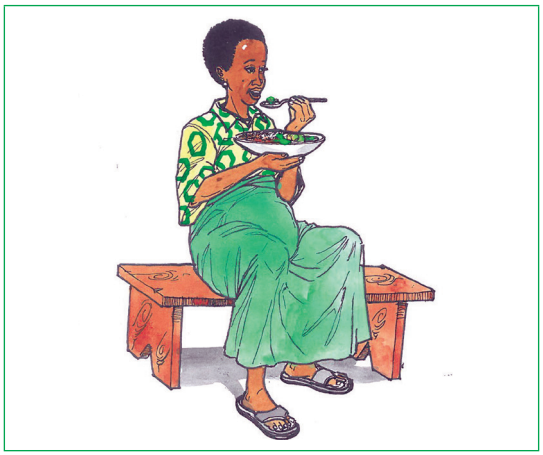


Figure 6.44: It is good to eat a balanced diet during pregnancy

4. Adequate balance

To select food, it should be well-balanced that is containing all food nutrients in right quantities which are; carbohydrates, proteins, fat, minerals and vitamins, this enables normal growth and good health of every individual.

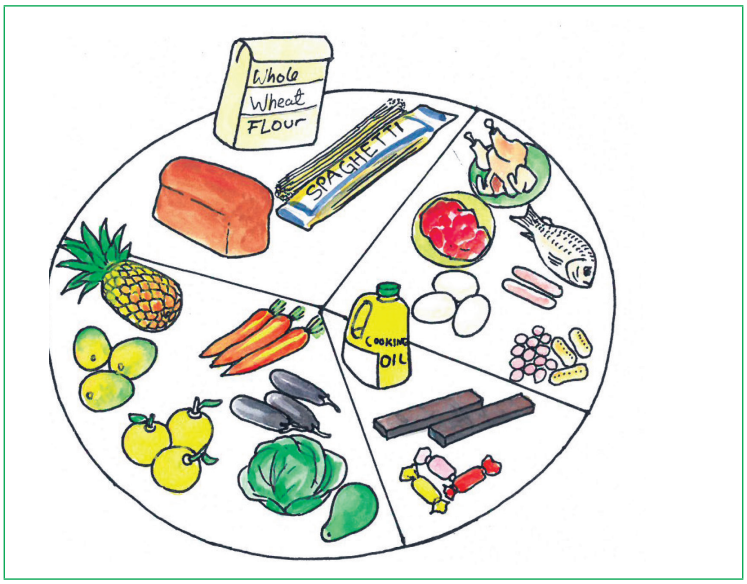


Figure 6.45: A balanced food selection

5. Caloric control

It is very important for groups of people living with diabetes, high blood pressure and the obese, these need to eat food with very little sugars and fat to avoid worsening their health conditions.

6. Vegetarian diets

This type of diet must be carefully planned, ensure it is well-balanced and use of creativity and skill avoids a dull monotonous diet. Vegetables, pulses, cereals, nuts, eggs, milk and its products are used to ensure the vegetarian acquires a well-balanced and nutritious meal.

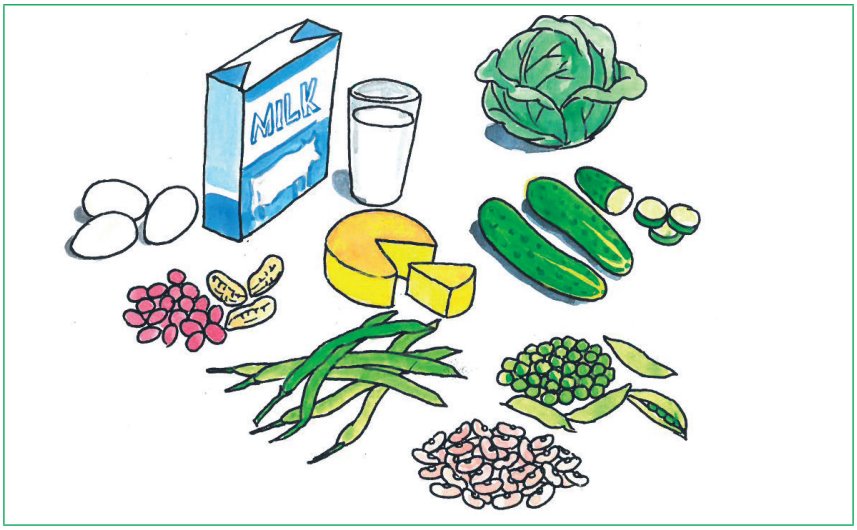


Figure 6.46: Vegetarian food

7. Abilities and skills of the food prepare that is; does he /she know how to prepare food? Does he /she have skills for roasting or steaming and so on.
8. Time that available for preparing food for example is there time for long slow cooking like steaming or stewing? Or the food preparer has no time but can use quick cooking methods like frying.
9. Foods that are available or that are in season: buy and plan for foods in season because they are cheaper and fresh, have a budget to avoid impulse buying.
10. Money available to spend on food: money for buying food should be evenly distributed over the all foods needed, the amount of money available influence what one will buy and eat but make sure you choose foods in season because they are cheap and at their best.
11. The number of people who are going to eat and their age will also influence the amount and type of food that you are going to cook and the way you are going to present it.
12. Individual dietary requirements of individuals like planning for children, adolescents, pregnant mothers, elderly people, invalids and convalescents, be aware of the foods to be avoided for religious or dietary reasons like avoiding salt, sugar and meat for vegetarians
13. Consider the resources available like the cooking facilities and storage facilities for example is there an oven to do the baking? Do you have a refrigerator to keep fresh perishable foods like fish and meat?
14. Occasion. The occasion the meal is being prepared for has to be considered, everyday meal will differ from those served on special occasions like birthday parties, family treats, graduation parties and anniversaries, these may involve additional expenses and extra time for meal preparation.
15. Ensure that texture and flavour is varied and the colours of food are also well varied so that the meal is tempting and you do not have to convince people to eat. This will reduce on monotony
16. Individual tastes: any pronounced dislike of food can retard the flow of digestive juices or impair digestion so plan foods that are a favourite to those who are going to eat.

Exercise 6.6

1. Investigate why people have different requirements for energy?
2. Discuss the necessity for pregnant women to have extra energy and intake of proteins.
3. Outline four examples of people with a sedentary lifestyle and four with an active lifestyle.
4. List groups of people who should have a caloric control diet.
5. Investigate the considerations taken when selecting food for an individual on caloric control diet?
6. Mention the examples of foods eaten by a person on a vegetarian diet.

Unit assessment

1. Mention the different types of nutrients.
2. Describe the functions of the following nutrients in the body and list their food sources:

   (a) Carbohydrates (b) Vitamin A (c) Proteins (d) Calcium
3. Classify vitamins with examples.
4. Evaluate the effect of the deficiency of the following nutrients:

   (a) Carbohydrates (b) Proteins

   (c) Vitamin A (d) Vitamin B_1

   (e) Vitamin C (f) Vitamin D

   (g) Phosphorus (h) Iodine

   (i) Sodium (j) Calcium

Relating Home Science to other subjects

This unit is related to other subjects in many aspects for example:

- Food nutrients are studied in food and nutrition.
- The organic elements that form nutrients are studied in the periodic table in Chemistry.
- Measurement of recommended daily intake is related to measurement of physical quantities in Physics.

UNIT SUMMARY

In this subtopic area, we have looked at types of food nutrients that is proteins, vitamins, carbohydrates, fat and mineral salts, their functions, sources, effect of deficiency and excess in the body. We also looked at the principles of food nutrients selection that is; growth, physical activities level, pregnancy, adequate balance, caloric control and vegetation diet.

GLOSSARY

Calorie: amount of heat required to raise the temperature of a kilogramme of water by one degree celsius.

Carbohydrates: substances such as sugar on starch that consists of carbon, hydrogen and oxygen for example bread, rice

Deficiency: the state of not having enough of something that is essential.

DNA: deoxyribonucleic acid and these are fundamental and distinctive characteristics of someone or something.

Excess: this refers to something that is more than necessary

Fat: having too much flesh on something and weighing too much.

Food: things that people or animals fees on

Mineral salts: essential organic food elements that are required for building the body especially bones and teeth

Nutrients: substances that are needed to keep living things alive and to help them grow

Proteins: natural substances found in meat, eggs, fish, some vegetables and so on

RNA: Ribonucleic acid, a nucleic acid present in all living cells and acts as a messenger carrying instructions from DNA.

SIADH: Syndrome of Inappropriate Anti-Diuretic Hormone.

Vegetarian: a person who does not eat any food that comes from animals and often does not use animal products.

Vitamins: natural substances found in food that are in essential part of what humans and animals eat to help them grow and stay healthy

Unit 7

OCCUPATION AND KITCHEN

In this unit, I should be able to:

- ≈ Identify specific kitchen materials, tools & equipment.
- ≈ Explain the occupation of food preparation.
- ≈ Manipulate kitchen materials, tools and equipment.
- ≈ Demonstrate maintenance procedures for kitchen tools and equipment.
- ≈ Practice procedures for basic dishes.

Key Unit Competence: Learners should be able to explain the occupation, use and maintain kitchen materials, tools and equipment safely.

7.1. INTRODUCTION TO OCCUPATION

Occupation is a vocation to which a person is specially drawn.

Alternatively occupation may refer to a job, a regular activity performed for payment that occupies one's time. It may also be done at home not for monetary purpose for example house keeping, cooking at home and so on. Food preparation as an occupation includes cooks or chefs in restaurants, food preparation plants for example meat and dairy processing plants and normal cooking of food.

History

The occupation of food preparation is one the oldest profession. Even in the Old Stone Age, people used to prepare their food. However, the methods that are used in food preparation and the technology are the ones which are keeping on changing.

At home, the methods of cooking food are changing from cooking using firewood to electric cookers, gas cookers and so on.

Working condition

- Many kitchens at homes in villages as well as older and smaller eating places are not well-equipped while modern restaurants have kitchens with modern equipment, convenient work areas and air conditioning.
- The cook should withstand strain of working for longer hours, lifting heavy pots and kettles and working near hot ovens or grills.
- Job hazards include slips and falls, cuts and burns and so on.

Requirements of the occupation

Figure 7.1: Restaurant

At restaurant

- Academic qualifications in food service or catering.
- Ability to work as part of a team, keen sense of taste and smell and personal cleanliness.
- Some places require health certificates indicating that workers are free from communicable diseases.
- Ability to minimise food waste and accurately anticipating the amount of perishable supplies needed.

At home

- The cook should be creative in order to balance the cooking tasks.
- Cooking skills are required in order to cook tasty food for family members. The cook should be fast in order to prepare food in time.

Exercise 7.1

1. What do you understand by the term occupation?
2. As a Home Science student, what characteristics would you recommend for a food preparation personnel.

Learner's Activity 7.1

Discuss the working conditions for a chef in one of the modern restaurants in your area.

7.2. KITCHEN MATERIALS, TOOLS AND EQUIPMENT

Learner's Activity 7.2

Discuss the different types of kitchen orientation.

Kitchen orientation

From the activity above, I shall have a clear picture of kitchen tools and equipment as well as their uses.

I shall also note that proper kitchen orientation minimises accidents, saves much time, minimises fatigue and ensures efficient working.

Figure 7.2: Modern kitchen

Figure 7.3: Local kitchen

Kitchen orientation is influenced by:

- shape, size and layout of area.
- room ventilation.
- lighting.
- working surface.

The equipment and kitchen units should be positioned in a logical order so that

food is moved onwards through the various stages of preparation.

This minimises fatigue and accidents because moving back and forth would have been minimised.

a) One wall plan/layout.

It is common where the kitchen area is limited. Here the work flows in a straight line from the work centres, that is, the food storage, washing area and the cooking area.

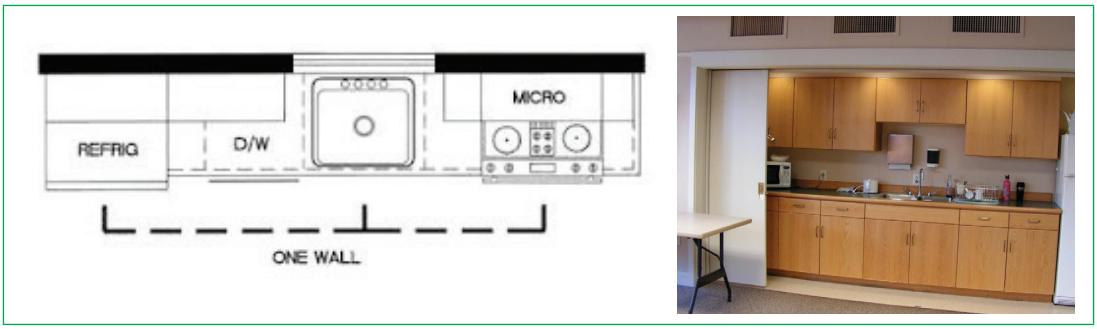


Figure 7.4: One wall layout.

b) Corridor plan/ layout

This is referred to as parallel shape layout where the two walls are arranged in a corridor shape with both ends of the corridor open.

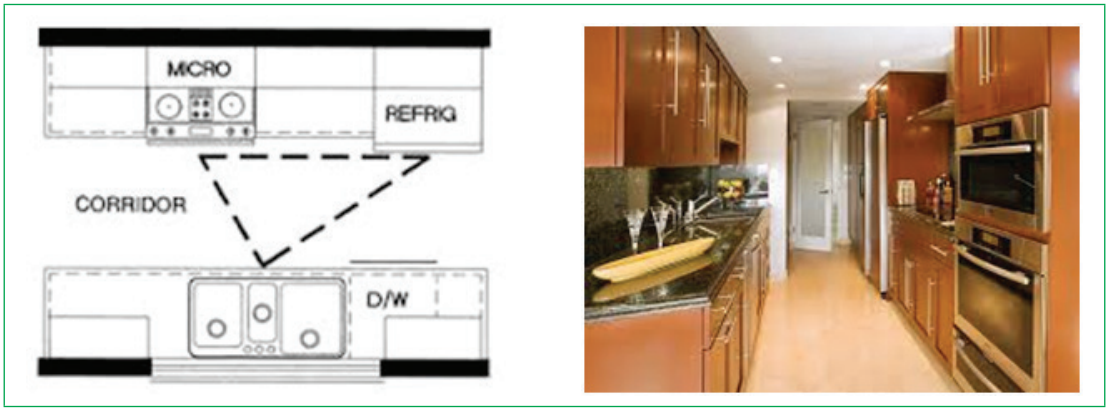


Figure 7.5: Corridor layout

This arrangement reduces the distance to be walked and therefore the work triangle (total distance walked between the three major working areas namely; wash up area, food storage and cooker) is a compact one.

One disadvantage is that because of the two open ends, it becomes a passage way.

c) L shaped layout.

Here the equipment is arranged on the two adjoining walls and so quite close to each other. It is popular in modern homes and also space is available for the kitchen table or even on for the dining if desired.

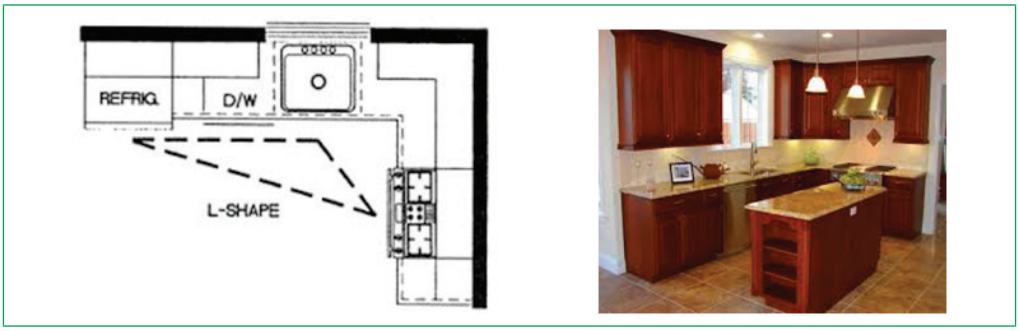


Figure 7.6: L Shaped kitchen orientation

d) U shaped kitchen layout

This is the most convenient kitchen arrangement where the work centres are within easy reach of each other and there is adequate provision of storage space.

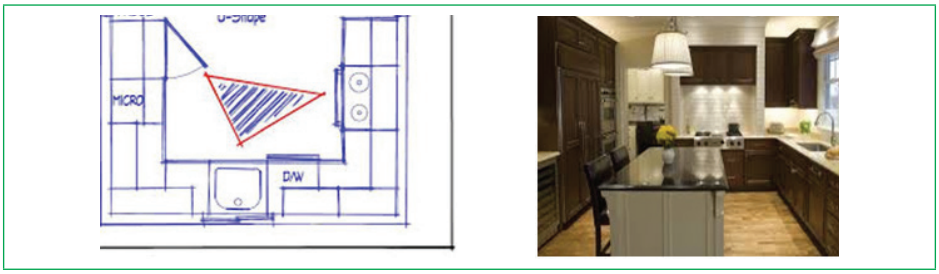


Figure 7.7: U shaped kitchen layout

In rural areas, the kitchen may not have any particular arrangement. A three stone cooker is normally used and the kitchen is basically a cooking area, the storage of equipment is done in the main house as well as serving of food. However some may serve food from the kitchen if it is big enough. Some families even don't have a kitchen, in this case,cooking is done from outside.

Exercise 7.2

1. What is meant by the term kitchen orientation?
2. What are the different factors affecting kitchen orientation?
3. What factors can you consider when planning kitchen layout?

7.3. KITCHEN TOOLS

Grater

We use graters normally at home

A grater is also known as a shredder. It is a kitchen utensil used to grate foods into fine pieces. There are different sizes of graters with different grating slots that aid in preparation of a variety of foods.

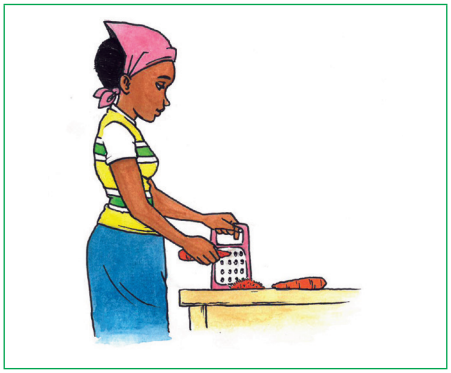


Figure 7.8: Girl grating carrots

Graters are commonly used to grate cheese, lemon or orange peel(to create zest) and can also be used to grate other soft foods.

Potato peeler

We normally use knives for peeling, but many modern kitchens use different equipments for peeling which includes a potato peeler.

A potato peeler is a kitchen tool consisting of a slotted metal blade attached to a handle, that is used to remove the outer skin or peel of certain vegetables, frequently potatoes, carrots, and fruits such as apples, pears and so on. A peeler differs from a knife in that the blade has a slot cut into it, which is sharpened on the inside edge, while the other side prevents the blade from cutting too far into the vegetable.

Figure 7.9: Potato peeler.

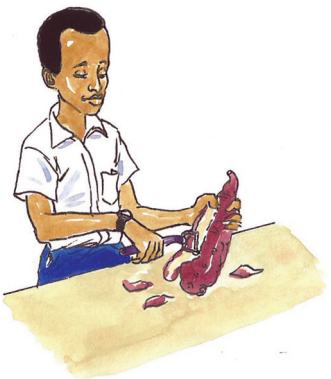


Figure 7.10: Using a potato peeler.

Use

Peelers are used for removing the outer skin or peeling vegetables like potatoes, carrots, fruits and so on.

Sieve

At home we normally use a sieve to remove unwanted particles from powdered food for example flour. A sieve or sifter is a device for separating wanted elements from unwanted material or for characterising the particle size distribution of a sample, using a woven screen such as a mesh or net. In cooking, a sifter is used to separate and break up clumps in dry ingredients such as flour, as well as to aerate and combine them. A strainer is a form of sieve used to separate solids from liquid.

Figure 7.11: Sieve

Figure 7.12: Using a strainer

Lemon squeezer

We normally use lemon squeezers when extracting juice at home. A lemon squeezer is a small kitchen utensil designed to extract juice from lemons or other citrus fruits such as oranges, grapefruit or lime. It is designed to separate and crush the pulp of the fruit in a way that is easy to operate. Lemon squeezers can be made from any solid, acid-resistant material, such as plastic, glass, metal or ceramic.

Figure 7.13: Lemon squeezer

Figure 7.14: Using a lemon squeezer

Fish slice

A fish slice is a kitchen tool with a wide flat blade with long holes in it, used for lifting and turning food while cooking. It is used for turning fish and other foods when frying them.

Figure 7.15: Fish slice.

Figure 7.16: Using a fish slice.

Whisks

We use whisks when preparing eggs, mixing ingredients and so on. A whisk is a kitchen utensil used in food preparation to blend ingredients smooth, or to incorporate air into a mixture, in a process known as whisking or whipping. Most whisks consist of a long, narrow handle with a series of loops joined at the end. The loops are usually metalic, but some are plastic for use with non-stick cookware. Whisks are also made from bamboo.

Whisks

Whisks are commonly used to whip egg whites into a firm foam to make meringue, or to whip cream into whipped cream.

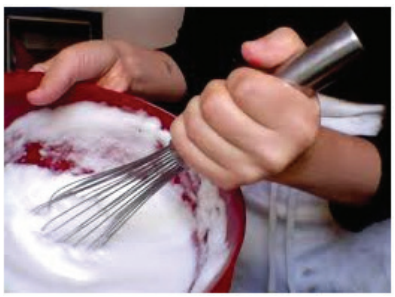


Figure 7.17: Whisking

Kitchen scale

We normally use kitchen scale for weighing different cooking ingredients.

Weighing/kitchen scale is a measuring instrument for determining the weight or mass of food and ingredients in the kitchen. We also use it to measure other objects. For example, to measure chemicals in laboratories and in pharmaceuticals.

Figure 7.18: Digital kitchen scale

Figure 7.19: Using kitchen scale

7.4. ELECTRICAL TOOLS

Toaster

A toaster is a modern equipment which we find at home. The toaster is a small appliance designed to toast multiple types of bread products. We use a toaster to toast bread and bread products. We have seen different types of toasters on market. However, the most common household toasting appliance is the pop-up.

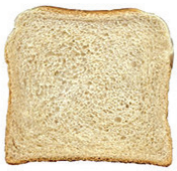


Figure 7.20: Untoasted slice of white bread

Figure 7.21: Toasted bread

Figure 7.22: Toaster

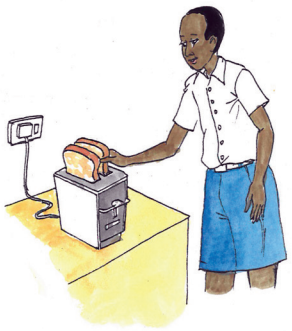


Figure 7.23: Using a toaster

Blender

We use a blender at home to prepare juice. We normally use the blender to mix, puree, or emulsify food and other substances. A blender consists of a blender jar with a rotating metal blade at the bottom, powered by an electric motor in the base. Some powerful models can also crush ice.

Figure 7.24: Blender

Figure 7.25: Using a blender

Food processor

This is a kitchen appliance used to facilitate repetitive tasks in the preparation of food.

The food processor uses interchangeable blades and disks (attachments) instead of a fixed blade. Their bowls are wider and shorter, which is a more appropriate shape for the solid or semi-solid foods. They require little or no liquid in there.

Figure 7.26: Food processor

Figure 7.27: Using a food processor

Pressure cooker

At home, we use a pressure cookers are used for cooking food more quickly than conventional cooking methods, this saves energy. Cooking using pressure cookers is known as pressure cooking. Pressure cooking is the process of cooking food, using water or other cooking liquids, in a sealed vessel known as a pressure cooker, which does not permit air or liquids to escape below a pre-set pressure.

Figure 7.28: Pressure cooker

Figure 7.29: Using a pressure cooker

Exercise 7.3

As a Home Science student, how can you use the following kitchen equipment?

a) Lemon squeezer b) Kitchen scale c) Whisks

Learner's Activity 7.3

Try out how to open a pressure cooker.

Coffee percolater

A coffee percolator is a type of pot used to brew coffee by continually cycling the boiling or nearly-boiling brew through the grounds using gravity until the required strength is reached.

Percolators often expose the grounds to higher temperatures than other brewing methods, and may recirculate already brewed coffee through the beans. As a result, coffee brewed with a percolator is susceptible to overextraction.

Figure 7.30: Coffee percolator

Figure 7.31: Using a coffee percolator

Microwave

A microwave oven is a kitchen appliance that heats food by bombarding it with electromagnetic radiation in the microwave spectrum causing polarised molecules in the food to rotate and build up thermal energy in a process known as dielectric heating. Microwave ovens heat foods quickly and efficiently because excitation is fairly uniform in the outer 25–38 mm of a dense (high water content) food item; food is more evenly heated throughout than it generally occurs in other cooking techniques.

Figure 7.32: Microwave

Figure 7.33: Using a microwave

Exercise 7.4

1. What are the common kitchen utensils in your community.
2. How are the following kitchen equipment used?
   a) Grater b) Potato peeler
   c) Pressure cooker d) Microwave

Learner's Activity 7.4

Read about kitchen equipment, then explain the operation of one in class.

7.5. HEAVY EQUIPMENT

Learner's Activity 7.5

Identify or describe heavy kitchen equipment they know.

After identifying any heavy kitchen equipment describe how it works.

(a) Deep freezer

We normally use a deep freezer to keep food for a long period of time. A deep freezer is a food preservation cabinet that is similar to a refrigerator, but with a much lower temperature of 0°c or even below. It is usually used to keep large quantities of fresh foodstuffs that run out of season.

Figure 7.34: Deep freezer

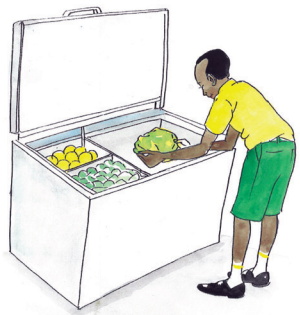


Figure 7.35: Using deep freezer

b) Refrigerators

These are storage facilities that are used for keeping perishable foods like meat, fish, milk, vegetables and so on . Refrigerators are operated by electricity, gas or paraffin. They are found in different sizes, designs and colours, the body of refrigerators is made of steel coated with synthetic enamel or porcelain. It has got a double wall which is fitted with insulating material to keep out warmth. Some

refrigerators have got a freezer compartment which has ice. The freezer is used to store foods that need freezing for example, meat, fish and so on in the lower compartment of fridge is used to store vegetables, eggs, bottles and cooked foods.

A refrigerator is used to keep food fresh and free from spoilage because temperature in it is too low for the growth of microorganisms. Food, especially perishables like meat, fruits, milk and vegetables can be preserved in a refrigerator for a longtime.

Figure 7.36: Refrigerator

Figure 7.37: Using refrigerator

Electric cooker

All of us are aware that an electric cooker is an electric powered cooking device for heating and cooking of food. An electric cooker often has four stoves and one or two ovens. There will be knobs to determine the temperature of the ovens and stoves.

Figure 7.38: Electric cooker

Figure 7.39: Using electric cooker

Gas cooker

As we noted, a gas cooker is also a heavy equipment found in the kitchen. A gas stove is a cooker/stove which uses natural gas, propane, butane, liquefied petroleum gas or other flammable gas as a fuel source. It is designed for the purpose of cooking food. Kitchen stoves rely on the application of direct heat for the cooking process and may also contain an oven, used for baking.

Figure 7.40: Gas oven with top stove

Figure 7.41: Using gas cooker

Salamanders

Salamanders are used for broiling, browning, caramelising, glazing, grilling and toasting food. They are used to finish off foods, rather than cook them.

Figure 7.42: Salamanders

Figure 7.43: Using salamanders

There are two forms of Salamanders. One is hand-held; the other is like an oven.

i) Hand-held

A hand-held one consists of a metal rod, with a wooden handle at one end, and at the other, a heavy-weight iron disk disks 3 to 4 inches ($7\frac{1}{2}$ to 10 cm) wide. It looks a bit like a branding iron, or a medieval weapon of torture.

ii) Oven-like Salamanders

These are an actual appliance, gas or electric powered. They can be stand-alone or wall-mounted. Both kinds are designed to be eye-level so that you can easily watch, and access, the food placed inside.

- Griddles are flat plates of metal used for frying, grilling, and making pan breads (such as pancakes, chapatis, and crepes). Traditional iron griddles are circular, with a semicircular hoop fixed to opposite edges of the plate and rising above it

to form a central handle. Rectangular griddles that cover two stove burners are now also common, as are griddles that have a ribbed area that can be used like a grill pan. Some have multiple square metal grooves enabling the contents to have a defined pattern, similar to a waffle maker. Like frypans, round griddles are generally measured by diameter (20–30 cm).

Figure 7.44: Griddles

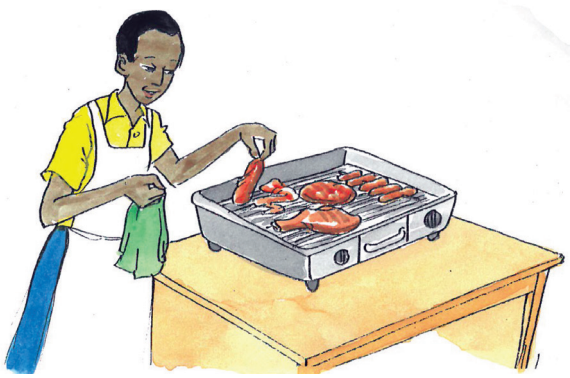


Figure 7.45: Using griddles

Casserole dish

- A casserole is a large, deep dish which we use both in the oven and as a serving vessel. It is usually of earthenware, glass, or cast iron, and it is used for baking and serving. Casserole pans resemble roasters and dutch ovens, and many recipes can be used interchangeably between them. Depending on their material, casseroles can be used in the oven or on the stove top. Casseroles are commonly made of glazed ceramics or Pyrex.

Figure 7.46: Casserole dish

Bake ware

We use bake ware for baking the oven. Bake ware is designed for use in the oven (for baking), and encompasses a variety of different styles of baking pans as cake pans, pie pans, and loaf pans.

- **Cake pans** include square pans, round pans, and speciality pans such as angel food cake pans and spring form pans often used for baking cheesecake.

Figure 7.47: Cake pans

Figure 7.48: Using cake pans

- **Sheet pans**, cookie sheets, and jelly-roll pans are bake ware with large flat bottoms.

Figure 7.49: Sheet pans

Figure 7.50: Baking using sheet pans

- **Pie pans** are flat-bottomed flare-sided pans specifically designed for baking pies.

Figure 7.51: Pie pans

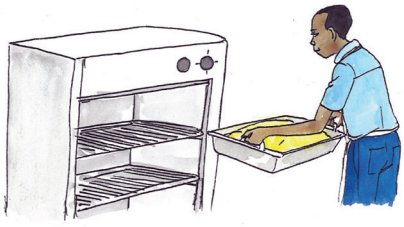


Figure 7.52: Using pie pans

Sauce pan

Saucepans (or just "pots") are vessels with vertical sides about the same height

as their diameter, which we use for simmering or boiling. Saucepans generally have one long handle. Larger pots of the same shape generally have two handles close to the sides of the pot (so they can be lifted with both hands), and are called sauce-pots or soup pots (3-12 litres). Saucepans and saucepots are measured by volume (usually 1–8 L). While saucepots often resemble Dutch ovens in shape, they do not have the same heat capacity characteristics.

Figure 7.53: Sauce pan

Figure 7.54: Using a sauce pan

- **Sauté pans**. We use sauté pans for sauteing, they have a large surface area, like a frypan, but with vertical sides to prevent food from escaping during cooking.

Figure 7.55: Sauté pans

Figure 7.56: Using sauté pans

- **Stockpots** are large pots with sides at least as tall as their diameter. This allows stock to simmer for extended periods of time without reducing too much. Stockpots are typically measured in volume (6-36 L). Stockpots come in a large variety of sizes to meet any need from cooking for a family to preparing food for a banquet. A specific type of stockpot exists for lobsters, and an all-metal stockpot usually called a **caldero** is used in Hispanic cultures to make rice.

Figure 7.57: Stock pots

Figure 7.58: Using a stock pot

- **Braising pans** and **roasting pans** are large, wide and shallow, to provide space to cook a roast (chicken, beef, or pork). They typically have two loop or tab handles, and may have a cover. Roasters are usually made of heavy gauge metal so that they may be used safely on a cook top following roasting in an oven. Unlike most other cooking vessels, roasters are usually oblong or oval. There is no sharp boundary between braisers and roasters - the same pan, with or without a cover, can be used for both functions. In Europe, a clay roaster is still popular because it allows roasting without adding grease or liquids. This helps preserve flavour and nutrients. Having to soak the pot in water for 15 min before use is a notable drawback.

Figure 7.59: Braising pans

Figure 7.60: Using braising pans

- **Dutch ovens**

Are heavy, relatively deep pots with a heavy lid, designed to recreate oven conditions on the stove top (or campfire). They can be used for stews, braised meats, soups, and a large variety of other dishes that benefit from low heat, slow cooking. Dutch ovens are typically made from cast iron, and are measured by volume.

Frying pans

These provide a large flat heating surface and shallow sides, and are best for pan frying. Frypans with a gentle, rolling slope are sometimes called **omelette**

pans.

Figure 7.61: Frying pans

Figure 7.62: Using frying pans

Grill pans are frypans that are ribbed, to let fat drain away from the food being cooked. Frypans and grill pans are generally measured by diameter (20–30 cm).

Figure 7.63: Grill pans

Figure 7.64: Using grill pans

7.6. MAINTENANCE PROCEDURES FOR KITCHEN TOOLS AND EQUIPMENT

Learner's Activity 7.6

Cleaning of refrigerator and a deep freezer.

After attempting the activity above, we can be able to apply the maintainance

procedure for kitchen tools and equipment.

1. Washing kitchen utensils

Figure 7.65: Washing utensils

Scraping: Remove all food scraps from the kitchen equipment.

Cleaning tips.

- Washing breaks up the chain of infection by removing bacteria and their breeding grounds.
- Complete washing up away from food preparation areas.
- Wash cutlery, glassware and tableware away from greasy pans and equipment.
- Glassware should be washed separately and if possible have its own dishwasher.
- When washing up by hand, wash equipment from least to most dirty.
- Change washing solutions regularly.
- Use the correct detergent as some have a bad effect on certain metals.

2. Oiling kitchen tools

Oiling kitchen tools like wooden ones increases longevity of wooden cutting boards, spoons and bowls.

Figure 7.66: Oiling kitchen tools

We use the following materials for oiling kitchen tools.

1. Bottle of mineral oil

2. Clean, old rags or multiple paper towels.

Directions

- Lay wooden items on one of the rags and fold the other into a square.
- Pour a small amount of mineral oil on the folded rag.
- Rub oil along the top surface of the wood, making sure it is distributed evenly. Allow the oil to soak in for 10-15 minutes before flipping over and oiling the other side.

3. Scrubbing

This is done to remove food remains from the kitchen tools. Materials regularly used for scrubbing include; scrubbing brush, dish cloth mainly used for wiping down counters and tables, scrubbing pads for hard to clean pots and pans, steel wool for heavy duty scrubbing, cloth towels for cleaning up quick messes and spills, rubber gloves for protecting your hands from cleaners, abrasive scrubbies and gross food.

Figure 7.67: Scrubbing

Scrubbing helps to ensure that kitchen tools are maintained clean free from food remnants and stains in order to ensure hygiene and safety.

7.7. IDENTIFICATION OF PROCEDURES FOR BASIC DISHES

Learner's Activity 7.7

Practice how to cut different types of vegetable cuts.

Vegetables cuts

Figure 7.68: Cutting vegetables on a board

How do you cut vegetables at home? There are many types of vegetable cuts. These include:

1. **Jardinière:** This involves cutting of vegetables into batons (3mm x 3mm x 18mm).	
2. **Julienne:** This involves cutting of vegetables into thin strips (3 - 4cm long).	
3. **Mirepoix:** Cutting of vegetables into roughly cut thin pieces.	
4. **Paysanne:** This involves cutting of vegetables into thin slices of 1cm diameter or side according to shape.	
5. **Macedoine**: This involves cutting of vegetables into dice (0.5cm x 0.5cm x 0.5cm).	
6. **Brunoise**: This involves cutting of vegetables into very small dice. (2mm x 2mm x 2mm).	

7. **Chiffonade**: This involves slicing of lettuce and leaf vegetables in very fine strips.	

Stock

Stock is made from water in which bones, meat, vegetables or fish have been simmered slowly to extract their flavour.

Learner's Activity 7.8

Discuss how is made at home a stock of food.

Method of making stock.

i. Avoid using too much fat, cut vegetables in large pieces and add herbs for flavour.

ii. After simmering for about 2 hours, strain and cool.

iii. Remove the surface fat before using.

iv. If kept, store in the refrigerator and boil for 5 minutes the next day to destroy bacteria.

v. Stock may be frozen.

vi. Stock cubes may be dissolved in water to produce a quickly made stock.

Sauces

A sauce is a thickened, flavoured liquid that can be added to food or dish. It can also be defined as a liquid food which is usually flavoured and thickened. More still a sauce can be defined as a liquid, cream or semi solid food served on a plate or used in preparing other foods. A good sauce should be smooth, glossy and of the desired consistency, colour, flavour and temperature. a good sauce will be having the correct consistence, well-seasoned and flavoured, smooth and glossy and so on. Sauces are not normally consumed by themselves; they add flavour, moisture and visual appeal to another dish.

Figure 7.69: Sauces

Importance of sauces in meal preparation

- Provide a contrasting texture, for example, curry sauce is left unsieved to provide texture.
- Bind ingredients for example, in rissoles they are used to bind.
- Improve and enhance flavour.
- Used as a coating and so on cauliflower and gratin.
- Adds colour.
- Contribute to the nutritive value.
- Provide moisture.
- Reduce the richness of some foods.
- Add interest and variety to a meal.
- They provide a contrast in flavour to the dish with which they are served, for example, apple sauce.
- They can be served as part of the dish. For example, braised celery.
- They can be served with food as an accompaniment, for example, custard.

Classification of sauces.

i. **Coating sauce:** This is the one which is poured over the food as part of the dish. Coating is the act of applying a liquid (in this case sauce) onto the surface of food, product in order to improve on its properties.

Figure 7.70: Coating sauce

ii. **Pouring sauce:** This is thinner and it is served separately to be added to food at the table.

iii. **Binding sauce** (Panada): This is very thick and is used as a base for soufflés to bind together ingredients and it is also used as a filling for pancakes, toasted sandwiches, and vol-au-vents.

iv. **Purée sauce:** This is the one made of fruit or vegetables and its served to counteract the richness of some dishes. For example,apple sauce with pork.

Figure 7.71: Puree sauce

v. **Mayonnaise:** This is also known as an oil and vinegar dressing. It is served with salads.

Figure 7.72: Mayonnaise

Making different sauces

A) Sauces thickened by gelatinisation of starch.

1. Blended sauce

Sauce	Milk	Flour/corn flour
Pouring	300 ml	15 g
Coating	300 ml	30 g
Panada	300 ml	60 g

Method.

Blend the flour in a mixing bowl with a little cold milk. Boil the rest of the milk and then pour over the paste in the bowl. Stir. Return to pan and heat to boiling point stirring all the time.

2) Roux

Roux is used as a thickener for gravy, other sauces, soups and stews. Melt fat in pan. Remove from the heat and stir in flour to form a roux. Slowly stir in the milk

a little at a time. Bring to the boil stirring all the time.

Sauce	Milk	Flour/corn flour	Fat
Pouring	300 ml	15 g	15 kg
Coating	300 ml	30 g	30 g
Panada	300 ml	60 g	30 g

B) Sauces thickened by the coagulation of egg proteins.

Egg custard

i. Thoroughly mix the egg york with milk and mayonnaise.

ii. Pour into a double sauce pan or mixing bowl over boiling water.

iii. Cook stirring all the time until the eggs coagulate and the sauce can coat the back of a spoon.

iv. Remove from the heat, stir in the flavouring and cool quickly so as to stop the coagulation.

Serving sauces with other dishes

Sauces may be used for savory dishes or desserts. They can be prepared and served cold like mayonnaise, prepared cold but served lukewarm like pesto or can be cooked like béchamel and served warm or again cooked and served like apple sauce.

NOTE: Some sauces are industrial inventions like Worcestershire sauce and soy sauce. Sauces for salads are called salad dressing, for example, mayonnaise and French dressing.

Figure 7.73: Béchamel

Figure 7.74: Apple sauce

Dipping sauce (dip): This is a common condiment for many types of food. Dips are used to add flavour or texture to a food such as pita bread, dumplings, crackers, potato chips and so on. Here the food is dipped or added into the dipping sauce. Dips are commonly used for finger foods, appetisers and other easily held foods. Thick dips based on sour cream, milk, yogurt, mayonnaise, soft cheese or beans are staple to hors d oeuvres and are thinner than spreads which can be thinned to make dips.

Fry sauce: This is a regional condiment served with French fries. It is often referred to as burger sauce and usually a simple combination of one part ketchup and two parts mayonnaise.

7.8. PRACTICING MAKING DIFFERENT SAUCES

Tomato sauce

Ingredients

- 25 g butter
- 1 Small chopped onion
- 1 Carrot
- 1 Rasher bacon
- 200 g Tomatoes
- Bay leaf
- 15 g flour
- A quarter pint water
- Salt and pepper
- Good pinch sugar

Method

1. Heat the butter and toss the onion, carrot and bacon in this; do not brown.
2. Add tomatoes and bay leaf and simmer for a few minutes.
3. Blend the flour with stock, add to the ingredients and simmer gently for about 30 minutes.
4. Stir from time to time.
5. Rub through a sieve , add seasoning and sugar and reheat.

Figure 7.75: Tomato sauce

Curry sauce

Ingredients

- 1 medium sized onion
- 1 small green pepper

- 1 cooking apple
- 25 g butter
- 1 level tablespoon curry powder
- 1 teaspoon curry paste
- 1 teaspoon salt
- 1 level tablespoon corn flour
- 1 tablespoon desiccated coconut
- 1 dessertspoon sultanas
- 1 teaspoon lemon juice
- 1-2 tablespoons milk

Method

1. Chop the onions, pepper and cooking apple and sauté in the butter.
2. Then add curry powder, paste, salt and corn flour.
3. Stir until blended, cook a few minutes and then stir in stock.
4. Bring to boil, stirring all the time.
5. Add chutney, coconut and sultanas.
6. Cover and simmer for atleast 1 hour. Stir in the lemon juice, add seasoning and the milk or cream if used.

Figure 7.76: Curry sauce

White sauce

Ingredients

- 25 g butter or margarine
- 25 g flour
- a half pint milk for coating consistency that is sauce a quarter pint milk for panada or binding consistency
- 1 pint mild doe thin white sauces for soups

Method

Heat the butter or margarine gently, remove from the heat and stir in the flour. Return to the heat and cook for a few minutes, so that the roux as the butter and flour misture is gradually called, does not brown. Again remove the pan from the heat and gradually blend in the cold milk. Bring to boil and cook, stirring with a wooden spoon, until smooth. Season well. If any small lumps have formed whisk sharply.

Figure 7.77: White sauce

Learner's Activity 7.9

Using locally available ingredients in your community prepare any of the following sauces:

(i) White sauce (ii) tomato sauce (iii) Onion sauce.

Unit assessment

1. How can you explain the meaning of a sauce?
2. How can you prepare a white sauce.
3. What are the factors that affect kitchen orientation?

UNIT SUMMARY

In this unit, we have looked at specific kitchen materials, tools and equipment. We are now able to maintain a positive attitude towards paying attention to workplace materials and make a positive contribution. We have also defined maintenance procedures for kitchen materials, tools and equipment which include: greasing, washing, oiling and scrubbing.

GLOSSARY

Abrasive: rough substance that can be used to clean and make a surface smooth

Agitator: person who tries to persuade people to take part in political protest

Bombarding: attacking a place by firing large guns at it or dropping bombs on it

Braise: to cook meat or vegetables very slowly with a little liquid in a closed container

Celery: vegetable with long crisp light green stems that are often raw

Coagulate: something that becomes thick and partly solid

Condiment: substance such as salt or pepper that is used to give flavour to food

Desiccated: something dried in order to preserve it

Emulsify: two liquids of different thickness that combine to form a smooth mixture

Enamel: substance that is melted onto metal, pots and so on

Meringue: sweet white mixture made from egg whites and sugar, usually baked until crisp and used to make cakes

Porcelain: hard white shiny substance made by baking clay and used for making delicate cups, plates and decorative objects

Pulsator: someone who makes strong regular movements or sounds

Puree: food inform of a thick liquid made by crushing fruit or cooked vegetables

Roux: mixture of fat and flour heated together until they form a solid mass, used for making sauces

Strainer: tool with many small holes in it, used for separating solids from liquids

Sultanas: small dried grapes without seeds used in cakes and so on

Synthetic: artificial made by combing chemical substances rather than being procedure naturally by plants or animals

Wringer: to go through a difficult or unpleasant experience

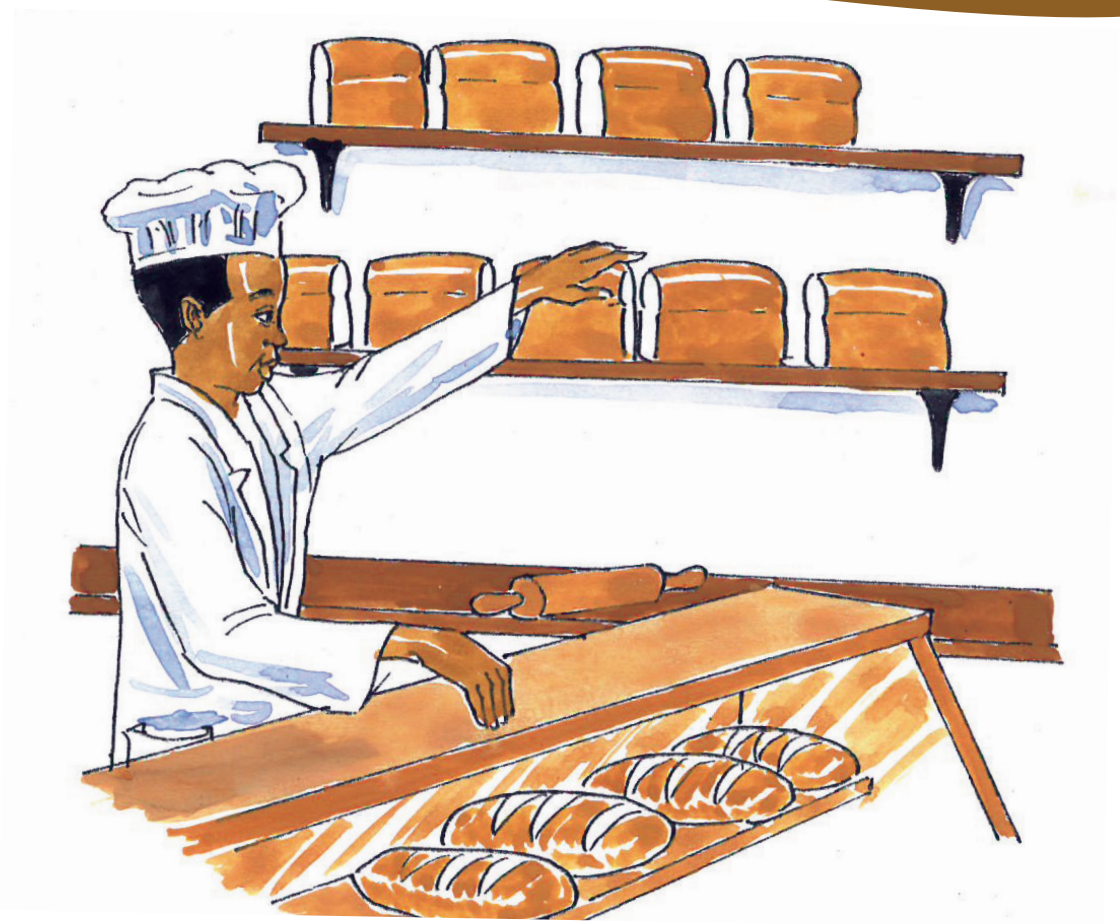
Unit 8

PASTRY AND BAKERY PRODUCTS

Learning objectives

In this unit, I should be able to:

- prepare types of dough and yeast bread products.
- name different ingredients used in pastry and bakery.
- list different ingredients that are used in pastry and bakery.



Key unit competence: Learners should be able to understand the differentiate types of pastry and bread and the process of baking..

8.1. INTRODUCTION TO PASTRY AND BAKERY

Pastry is a dough of flour, water and shortening that may be sweetened. One may talk of baked products as pastries, the difference between pastry and bread is that bread has a lower fat content so pastries have a higher one and therefore appear flaky and crumby in texture. A bakery is an establishment where flour baked food baked in an oven is produced and sold. Examples of baked products include, bread, cookies, cakes, pastries, and pies.

Learner's Activity 8.1

Identify the different baked products common in your community.

8.2. TYPES OF DOUGH AND PRODUCTS

From our findings, we shall be able to explain types of dough and products as follows:

1) BREAD.

What are the main ingredients for bread making? Bread making involves the use of the following ingredients; flour, liquid, sugar, yeast and salt. However, richer mixtures may contain fat, sugar, eggs, fruits, nuts and spices.

Figure 8.1: Bread

What are the characteristics of good quality bread? Good quality bread has the following characteristics:

(i) Good symmetrical shape with a well-rounded top.
(ii) Uniform golden brown crust.
(iii) A nutlike flavour free from yeast taste.
(iv) Well risen but not over inflated.
(v) Moist texture with a moist and resilient crumb.

Learner's Activity 8.2

Identify any other characteristics of bread that you know.

What are the common methods of bread making?

i. The traditional method involves creaming, mixing, kneading, rising, re-kneading, shaping, proving and baking.

ii. Chorleywood process: This is a more quicker method is where extra yeast and water are used and vitamin C may be added to the dough as an improver. It involves creaming, mixing, kneading, shaping, proving and baking.

What are the common stages that are followed in making bread?

When making bread we usually follow the following processes.

i. **Mixing:** This involves sieving flour and salt followed by the rubbing in of the fat and the mixing of the warm liquid and yeast.

Figure 8.2: Mixing

ii. **Kneading:** This is the working together of the mixed ingredients on a lightly floured working surface or in a bowl.

Figure 8.3: Kneading

iii. **Rising:** Here the dough is put into a clean mixing bowl which is placed in a polythene bag and left in a warm place to double its size.

Figure 8.4: Rising

iv. **Shaping:** Here the risen dough is kneaded again to distribute the carbon dioxide evenly and then cut and shaped as desired.

Figure 8.5: Shaping

v. **Proving:** Here the dough is left to rise in a warm place until it has doubled its size.

vi. **Baking:** Here the dough is put in an oven.

Figure 8.6: Baking

Have you ever tried out making bread at home or school? How did you make it? What are the ingredients used? Here is a recipe for bread making.

Ingredients for bread making

i. 500g of plain flour.
ii. Level tea spoon salt.
iii. Level tea spoon sugar.
iv. 25g flesh yeast.
v. 300ml warm liquid.
vi. 250g ascorbic acid.
vii. 15-25g margarine.

Procedure for bread making

i. Weigh the ingredients.
ii. Sieve the dry ingredients such as flour, salt and others into a bowl.

Figure 8.7: Sieving

iii. Rub fat into the flour.

Figure 8.8: Mixture before rubbing

iv. Cream the yeast with sugar and a little warm liquid.

Figure 8.9: Creamed in mixture

v. Mix the dissolved yeast with the remaining warm liquid and pour into the flour to form soft dough that will leave the sides of the bowl clean.

vi. Kneed for 10 minutes on a board and put a dough into a greased polythene bag and leave for 5 minutes.

vii. Shape as required into rolls and place on greased tray and prove.

Figure 8.10: Making rolls

viii. Bake at 230 degrees Celsius in an oven.

Exercise 8.1

1. What do you understand by the term bread?
2. What are the different stages involved in bread making.
3. Identify the characteristics of well-made bread?

Learner's Activity 8.3

- With the guidance of your teacher, prepare and bake bread in your school Home Science Laboratory.

2) SCONES

Have you ever prepared scones? How did you prepare them? What are the key characteristics that you would like good quality scones to possess? Here are some of the characteristics of good scones.

(i) Smooth surface

(ii) An even symmetrical shape

(iii) A uniform golden brown crust that is both crisp and tender.

Figure 8.11: Scones

Making scones.

Try out making scones at school using the following ingredients.

(i) 200 g flour

(ii) 25-50 g sugar

(iii) 25-50 g margarine

Figure 8.12: Margarine

(iv) 3 level tea spoons baking powder

(v) Egg (optional)

(vi) 4-6 table spoon milk

Procedure for making scones

(i) Sieve the flour and baking powder into a bowl

(ii) Add the sugar

(iii) Rub in the fat using the finger tips until the mixture looks like fine bread crumbs.

Figure 8.13: Rubbing in the fat using fingers

(iv) Make a well in the mixture

Figure 8.14: Making a well in the mixture

(v) Add the eggs, if used and milk to form stiff dough

(vi) Turn the dough on a flavored pastry board and knead very lightly

(vii) Roll the dough until 2 cm thick and cut into any shape

Figure 8.15: Rolling the dough

(viii) Arrange on a greased baking tray and glaze with milk

Figure 8.16: Arranging on a greased baking tray

(ix) Place on the middle shelf and bake

(x) Cool on a wire rack

Figure 8.17: Cooling on a wire rack

Exercise 8.2

1. What are scones?
2. How can you identify well made scones?

Learner's Activity 8.4

With the guidance of your teacher, prepare and bake Scones in your school Home Science Laboratory.

3) BISCUITS AND COOKIES

What are biscuits? How can biscuits be made? These can be made using various methods of cake making. These include; rubbing in, creaming, whisking and melting method.


Figure 8.18: Biscuits

How are Biscuits different from cakes?

i. The consistency of the mixture is very stiff and little or no liquid is added and can be easily rolled out.

ii. Little or no raising agent is used, this makes the texture crisp, and does not merely crumble.

iii. The baking temperature is a bit higher.

Figure 8.19: Cake

Figure 8.20: Biscuit

What are characteristics of biscuits? Identify any other characteristic of biscuits.

i. Symmetrical shape.
ii. Short and crisp texture.
iii. Pale brown colour.
iv. Pleasant flavour.

Exercise 8.3

1. What are the characteristics of well-made biscuits?
2. Discuss what makes plain cakes different from rich cakes.

Learner's Activity 8.5

Prepare and bake any of the following types of biscuits in your school Home Science Laboratory.

(i) rubbed in biscuit (ii) creamed biscuit

(iii) metted biscuit (iv) creamed biscuit

4) CAKES

What are the common ingredients used in cake making? The main ingredients used in cake making include; flour, sugar, fat, eggs, raising agents and fruits. The higher the proportion of fat to flour the richer the cake.

Figure 8.21: Eggs

Figure 8.22: Flour

Methods of cake making

What are the common methods of cake making? These are some of the common methods of cake making. Rubbing in method, creaming method, whisking method and melting method.

Classification of cakes

i. **Plain cakes:** These contain half or less fat to flour and are usually rubbed in cakes. Examples include: loaf cakes, plain fruit cakes.

Figure 8.23: Loaf cake

ii. **Rich cakes:** These have more than half fat to flour and are usually creamed in cakes. For example victorious sandwich, madeira cakes, butterfly cakes, queen cakes and so on.

Figure 8.24: Victorious sandwich

iii. **Spongy cakes:** These contain no fat and are usually whisked cakes. For example swiss roll, sponge cake mixtures and so on.

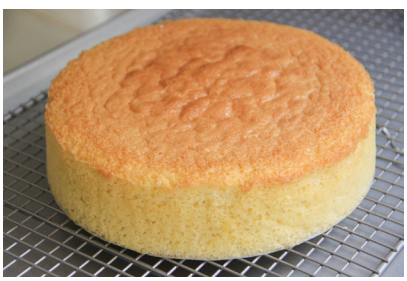


Figure 8.25: Spongy cake

iv. **Ginger bread:** This is usually made by melting method. Other examples of cakes made by melting method include: ginger nuts, perkins and so on.

Test for cooking.

The cake should shrink a little from the side of the tin, firm to press, no sound of bubbling and it should be evenly brown.

Exercise 8.4

1. Name the different types of cakes
2. How can you differ a biscuit from cake?

Learner's Activity 8.6

Prepare and bake any of the following types of cakes in your school Home Science Laboratory.

(i) Queen cakes

(ii) Butter fly cakes (iii) Madeira cake

5) PASTRY

What is a pastry?

A pastry is a flour mixture that is light, flaky, crisp and crumbles easily. Ingredients in pastries are flour, fat, water and salt.

The proportion and the method of incorporating the ingredients determines the variety and texture of the finished pastry. Richer pastries may have sugar, eggs or cheese added.

What are the common guidelines followed when making pastry. These are some of the general rules for pastry making.

i. Keep everything as cool as possible that is, utensils, ingredients, hands and so on as air has more capacity to expand when warm.

ii. Introduce as much air as possible in sieving, mixing, folding and so on.

iii. Handle lightly and roll lightly to avoid pressing out air.

iv. Use only enough water to bind pastry together as too much makes the pastry hard.

v. Use as little flour as possible for rolling out, too much makes pastry hard.

vi. Do not stretch the pastry during rolling or it will shrink during cooking.

vii. The pastry may be improved by leaving it to relax in a cool place before cooking.

viii. Cook in a hot oven until the pastry is set.

ix. Cool the pastry after cooking away from a draught.

What are the different types of pastry? The following are common types of pastry:

1) Short crust pastry

Figure 8.26: Short crust pastry

Basic Ingredients

200 g plain flour, 50 g lard, 50 g margarine, 30-40 ml cold water.

Method for making short crust pastry

i. Sieve flour and salt into the mixing bowl.

ii. Cut fat into small pieces and rub into flour with the fingertips until the mixture looks like bread crumbs.

iii. Add the water all at once and mix it in with a round bladed palate knife.

iv. Press together with fingertips and knead lightly on a floured surface.

v. Mix with an egg yolk and a little cold water.

Uses of short crust pastry.

- It can be used to make pies, tarts, flans and so on.

Uses of pastry in preparation of dishes

1. MAKING SAMOSAS

Ingredients for samosa pastry

- 2 cups of flour
- 4 teaspoons oil/butter/glue
- 5-6 teaspoons water
- Salt as required
- Oil for deep frying

Ingredients for stuffing

- Potatoes
- Peas
- Cumin
- Ginger green chilli paste
- Spice powder
- Coriander leaves
- Minced meat
- Vegetables for example peas

Method for Samosa pastry

- Take the flour, salt in a bowl. Mix well and add ghee or oil.

Figure 8.27: Mixing all ingredients

- With your fingertips rub the ghee/oil in the flour to get a bread crumb like consistency.
- The whole mixture should clamp together when joined.

Figure 8.28: The mixture should clamp together

- Add 1 or 2 teaspoon water.
- Begin to kneed adding water as required.

- Kneed to a firm dough. Cover the dough with a moistened napkin and keep aside for 30-40 minutes.

Stuffing

- Boil or steam the potatoes and peas till they are cooked completely.

Figure 8.29: Boiling the potatoes

- Peel the potatoes and chop them into cubes.

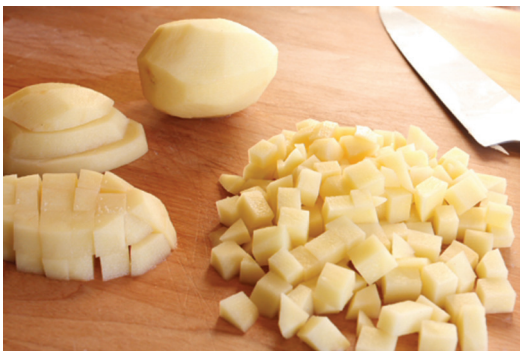


Figure 8.30: Chopping potatoes into chubs

- Heat oil in a pan.

Figure 8.31: Heating oil in a pan

- Crackle the cumin first, then add the gingers green chilli paste and sauté till the raw aroma of ginger goes away.
- Lower the flame and add all the dry spice powders one by one.
- Stir and then add potato cubes and peas along with salt.

Figure 8.32: Adding potatoes chubs and other ingredients

- Sauté for 2-3 minutes.
- Switch off and add the chopped coriander leaves from top and stir well.
- Keep aside

Baking the samosas

- Preheat the oven to 180°C
- Brush oil lightly on the prepared samosas.
- Place them in a baking tray and bake for 30-35 mins or till light golden at 180°C

2. CHAPATIS

Ingredients for making a chapati

- 2 cups flour (sifted)
- 1 teaspoon salt
- Warm water
- Cooking oil
- Finely chopped onions (optional)
- Finely chopped garlic (optional)

Methods for making a chapati

- Allow ingredients warm if they have been refrigerated.
- Mix flour, onion and salt in a bowl.

- Slowly mix enough water to make a thick dough.
- Kneed dough for a few minutes adding a couple spoonful of dry flour.
- Cover bowl of dough with a clean cloth and let it sit for about a half hour.
- Preheat and lightly grease the frying pan.
- Divided the dough into tangerine sizes balls.
- Using a rolling pin on a floured board flatten the balls into six inch circles.
- Lightly flour the chapatis before stacking while rolling additional chapatis.
- Fry until each side has golden-brown spots, flipping once.
- Cover the cooked chapatis until served.

Learner's Activity 8.7

With the guidance of your teacher, prepare any product using short crust pastry in your school Home Science Laboratory.

NOTES FOR FURTHER READING

1) BREAD

Reasons for faults in bread making.

1) Un even texture.

This is caused by:

i. insufficient kneading resulting in uneven distribution of gases causing un even holes.

ii. too cool an oven for the initial cooking period and allows fermentation to proceed for too long.

iii. overproving.

2) Sour bread.

This is caused by:

i. use of stale yeast.

ii. too high a proportion of yeast used.

iii. overrising or overproving of the dough resulting in acid development.

3) Heavy (sad) bread.

This is caused by:

i. Use of stale yeast.

ii. Too hot conditions that may have killed the yeast.

iii. Too cool conditions.

Important points to note during bread making

i. Yeast must be fresh.

ii. Flour must be the strong glutenous type.

iii. Mixing and kneading must be thorough.

iv. Proving must be well done.

2) SCONES

Faults in scone making and their causes.

Fault	Causes.
Un even rising	⅄ Bad kneading. ⅄ Uneven rolling.
Loss of shape	⅄ Too much liquid. ⅄ Too much fat used for greasing trays. ⅄ Too much raising agent. ⅄ Bad kneading.
Heavy texture	⅄ Insufficient raising agent. ⅄ Insufficient liquid. ⅄ Cool oven. ⅄ Over handling of dough.

3) CAKES

Reasons for common faults in cake making.

Fault	**Reasons for the fault.**
Close heavy texture	⅄ Too slow in an oven. ⅄ Mixture being too wet. ⅄ Insufficient raising agent.
Sunken cake	⅄ Excess raising agent. ⅄ Too slow in an oven. ⅄ Moving the tin.

Coarse open texture	⅄ Too much raising agent. ⅄ Uneven mixing.
Heavy whisked sponge	⅄ Insufficient whisking over hot water. ⅄ Mixture too hot if whisked over hot water. ⅄ Careless folding of flour which presses out air.
Cracked Swiss roll	⅄ Too much flour. ⅄ Too much sugar. ⅄ Insufficient trimming of edges. ⅄ Cake allowed cooling before rolling.
Heavy ginger bread	⅄ Too much syrup and sugar. ⅄ Overheating fat and sugar. ⅄ Over beating after adding liquid.

4) PASTRY

Faults in pastry making and reasons.

Short crust pastry	Sunken pie crust	Insufficient cooling .
	Blistered pastry	⅄ Un even rubbing in. ⅄ Water added in slowly and un evenly. ⅄ Cooking too high in the oven.
	Soggy pastry	⅄ Steam not allowed to escape during cooking. ⅄ Presence of sugar on top of fruit.
Rough puff and flaky pastry	Lack of flakiness.	⅄ To dry a mixture. ⅄ Careless blending and pressing of fat. ⅄ Fat allowed to melt during preparation. ⅄ Edges sealed by careless rolling. ⅄ Insufficient time allowed for relaxation. ⅄ Too cool an oven.
	Un even rising	⅄ Uneven rolling and folding. ⅄ Little resting time.

Pastry glazes.

These are used to give an attractive finish.

Sweet pastry: Here the surface of the pastry is brushed with milk or beaten egg white. Lightly sprinkle with castor sugar before or after baking.

Savoury pastry: Here the surface is glazed with milk, beaten egg and salt or an egg wash made with equal quantities of egg yolk and water. There should be a glossier and darker brown glaze than on sweet dishes.

TYPES OF YEAST BREADS

What are the different types of yeast breads?

Yeast breads include batter breads and dough breads.

Batter bread

Batter is a mixture of flour, margarine, sugar and sometimes eggs,that can be easily poured like cake batter, into a pan or it can be dropped from a spoon, like cookie batter.

Batter bread is a soft bread made of cornmeal and sometimes rice or hominy.

Dough bread

A dough is commonly shaped by hand before placing it in a pan or on a baking sheet. These are mainly used to make quick bread (bread made with a leavening agent for example, baking powder that permits immediate baking of the dough or batter mixture).

Note: A batter has a higher liquid content than dough and cannot be shaped by hand.

DIFFERENT PASTRY AND BAKING INGREDIENTS

Learner's Activity 8.8

In groups of three, visit the kitchen or Home Science Laboratory and select different ingredients used in pastry and baking and make simple items such as; cakes, cookies and so on.

What are the different commonly used pastry and baking ingredients?

The following are examples of commonly used pastry and baking ingredients.

- **Baking powder**

It is a common aerating agent in baked products such as cakes. It is made up of bicarbonate of soda and cream of tartar. It is a chemical raising agent.

- **Eggs**

These provide structure, aeration, flavour and moisture. They also help to tenderise cakes and add colour and nutritive value.

❍ Fats and oils

Butter and margarine are the commonly used ones. They help to shorten or tenderise the product, to trap air during creaming and so aerating the cake during baking to give good volume and texture. They assist with layering in puff pastry, to help prevent curdling by forming an emulsion and to add flavour. They also provide some nutritive value.

Too much fat makes a baked product greasy and unpleasant to eat while too little fat makes the product to lack flavour as well as staling quickly.

❍ Flour

Is the main ingredient for making baked products. It is made up of starch, protein, sugars and minerals. The protein content decides what the end-use of the flour will be.

❍ Milk

It improves the texture and mouth feel of baked products. The protein content of milk gives a soft crumb structure in cakes and contributes to the moisture, colour and flavour of a baked product. Cakes containing milk tend to have a longer shelf life.

Salt

Usually added in small amounts. It brings the natural flavour of other ingredients. In bread dough, salt strengthens gluten and improves the consistency of the dough. Salt is also a preservative as it absorbs water so there is less free water for bacterial and fungal growth.

❍ Water

Water is an essential ingredient used to bind ingredients together, forming the structure and help to create steam to and rising of the pastry.

❍ Sugar

It gives sweetness to cakes and other baked products. In yeast raised products, it acts as food for the yeast. In cakes, it assists with the aeration and stabilising of batters. It also improves flavour and helps to retain moisture, keeping products softer for longer and so reducing staling.

Examples of sugar forms include; icing sugar, castor sugar and granulated sugar.

❍ Yeast

This belongs to the fungi family. It ferments carbohydrates (sugar) to produce carbon dioxide gases and alcohol, which aerate bread and other yeasted products, giving it volume and texture. These byproducts of yeast also contribute to the colour and aroma of bread and other yeast products.

Unit assessment

1a) What is a pastry?

b) What are the guidelines followed when making a pastry?

c) Mention any four characteristics of a well made biscuit.

d) What is the procedure for making biscuits?

2. How can you use the following ingredients in baking?

(a) sugar (b) flour

(c) baking power (d) salt

Relating this unit with other subjects

Knowledge of Biology and English enables us to understand the subject matter very well.

UNIT SUMMARY

In this topic area, we have looked at pastry and bakery. The bakery included bread making, scones, cakes and biscuits. The pastry section included types of pastry. The unit has also looked at pastry and pastry ingredients.

GLOSSARY

Baking: process of cooking using dry heat in an oven.

Biscuits: small flat dry cake for one person usually sweet and baked until crisp

Bread: type of food made from flour, water and usually yeast mixed together and baked

Cakes: sweet food made from mixture of flour eggs, butter, sugar and baked in an oven

Choux: type of very light pastry made with eggs

Cookies: small flat sweet cake for one person usually baked until crisp

Creaming: pale yellowish white in colour substance spread on cake or bread.

Crust: hand layer or surface especially above or around something for example bread.

Flaky: tending to break something into small, thin pieces

Glazes: to cover something with a glaze to give it a sling surface

Hominy: dried corn boiled in water or milk

REFERENCE

Anita Tull. (1996) Food and Nutrition, Oxford University Press

Ballentine R. (1989) Diet and Nutrition: A Holistic Approach, Himalyan Press.

Davies S., Stewart A. (1987) Nutritional Medicine, Pan Books.

James W.P.T. (1988) Healthy Nutrition: Preventing Nutrition Related Diseases in Europe. WHO Regional Publications.

Lazarides L. (1996) Principles of Nutritional Therapy, Harper Collins.

Terras S. (1994) Stress, How Your Diet can Help: The Practical Guide to Positive Health Using Diet, Vitamins, Minerals, Herbs and Amino Acids, Thorsons.

Calderin, Jay (2009). Form, Fit, Fashion. Rockport. pp. *116–7. ISBN 978-1-59253-541-5.*

"BBC GCSE Bitesize: Types of Fibre". BBC. Retrieved November 9, 2011.

"FiberSource: The Manufactured Fiber Industry". FiberSource. Retrieved November 10, 2011

Picken, Mary Brooks (1957). The Fashion Dictionary. Funk and Wagnalls.

Reader's Digest (1976). Complete Guide to Sewing. The Reader's Digest Association, Inc. *ISBN 0-89577-026-1*

David Foskett, Victor Ceserani. Ceserani & Kinton's the theory of catering 11th edition.2007

Sethi M. catering Management: An integrated approach 1995