



Ministry of Education
and Sports

HOME-STUDY LEARNING

SENIOR
1

FOODS AND NUTRITION

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This material has been developed as a home-study intervention for schools during the lockdown caused by the COVID-19 pandemic to support continuity of learning.

Therefore, this material is restricted from being reproduced for any commercial gains.

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FOREWORD

Following the outbreak of the COVID-19 pandemic, government of Uganda closed all schools and other educational institutions to minimize the spread of the coronavirus. This has affected more than 36,314 primary schools, 3129 secondary schools, 430,778 teachers and 12,777,390 learners.

The COVID-19 outbreak and subsequent closure of all has had drastically impacted on learning especially curriculum coverage, loss of interest in education and learner readiness in case schools open. This could result in massive rates of learner dropouts due to unwanted pregnancies and lack of school fees among others.

To mitigate the impact of the pandemic on the education system in Uganda, the Ministry of Education and Sports (MoES) constituted a Sector Response Taskforce (SRT) to strengthen the sector's preparedness and response measures. The SRT and National Curriculum Development Centre developed print home-study materials, radio and television scripts for some selected subjects for all learners from Pre-Primary to Advanced Level. The materials will enhance continued learning and learning for progression during this period of the lockdown, and will still be relevant when schools resume.

The materials focused on critical competences in all subjects in the curricula to enable the learners to achieve without the teachers' guidance. Therefore effort should be made for all learners to access and use these materials during the lockdown. Similarly, teachers are advised to get these materials in order to plan appropriately for further learning when schools resume, while parents/guardians need to ensure that their children access copies of these materials and use them appropriately. I recognise the effort of National Curriculum Development Centre in responding to this emergency through appropriate guidance and the timely development of these home study materials. I recommend them for use by all learners during the lockdown.



Alex Kakooza
Permanent Secretary
Ministry of Education and Sports

ACKNOWLEDGEMENTS

National Curriculum Development Centre (NCDC) would like to express its appreciation to all those who worked tirelessly towards the production of home-study materials for Pre-Primary, Primary and Secondary Levels of Education during the COVID-19 lockdown in Uganda.

The Centre appreciates the contribution from all those who guided the development of these materials to make sure they are of quality; Development partners - SESIL, Save the Children and UNICEF; all the Panel members of the various subjects; sister institutions - UNEB and DES for their valuable contributions.

NCDC takes the responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for improvement. The comments and suggestions may be communicated to NCDC through P.O. Box 7002 Kampala or email admin@ncdc.go.ug or by visiting our website at <http://ncdc.go.ug/node/13>.



Grace K. Baguma
Director,
National Curriculum Development Centre

ABOUT THIS BOOKLET

Dear learner, you are welcome to this home-study package. This content focuses on critical competences in the syllabus.

The content is organised into lesson units. Each unit has lesson activities, summary notes and assessment activities. Some lessons have projects that you need to carry out at home during this period. You are free to use other reference materials to get more information for specific topics.

Seek guidance from people at home who are knowledgeable to clarify in case of a challenge. The knowledge you can acquire from this content can be supplemented with other learning options that may be offered on radio, television, newspaper learning programmes. More learning materials can also be accessed by visiting our website at www.ncdc.go.ug or ncdc-go-ug.digital/. You can access the website using an internet enabled computer or mobile phone.

We encourage you to present your work to your class teacher when schools resume so that your teacher is able to know what you learned during the time you have been away from school. This will form part of your assessment. Your teacher will also assess the assignments you will have done and do corrections where you might not have done it right.

The content has been developed with full awareness of the home learning environment without direct supervision of the teacher. The methods, examples and activities used in the materials have been carefully selected to facilitate continuity of learning.

You are therefore in charge of your own learning. You need to give yourself favourable time for learning. This material can as well be used beyond the home-study situation. Keep it for reference anytime.

Develop your learning timetable to cater for continuity of learning and other responsibilities given to you at home.

Enjoy learning

SENIOR ONE

HOME STUDY MATERIAL

NUTRITION AND FOOD TECHNOLOGY

Topic: Introduction to Nutrition and Food Technology

By the end of this topic, you should be able to;

- Identify the feeding habits and practices of people from different cultural backgrounds.
- Find out the factors that influence feeding habits and practices of people.
- Maintain a good standard of food and kitchen hygiene.
- Clean kitchen surfaces using different cleaning agents.

Lesson 1:



Learning Outcomes

In this lesson, you should be able to:

- Describe the feeding habits and practices of people from different cultural backgrounds.
- Find out the factors that influence feeding habits and practices of people.

Study requirements:

You will need time, a notebook, a pen, actual food items and images of any food related material from magazines, newspapers

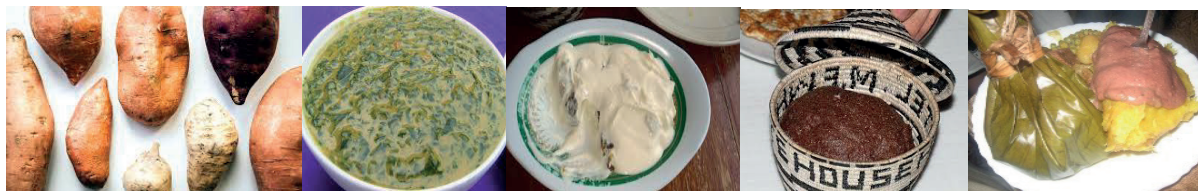
Instructions

As you go through this lesson, open your mind to think of all information that you have heard in the line of nutrition and food technology from different cultures all over the world.

Introduction

You are different from everybody around you. The foods you feed on, the quantities, the occasions, and the timing are different. That is what we call a difference in feeding habits. It is important for you to know the feeding habits and practices of different cultures.

Food from different cultures.



Activity 1: Discovering the feeding habits and practices of different cultures.

- You have a cousin sister who has been staying in Mbale and is a teacher in Mbale S.S.S, she has requested you to visit her after the lock down period, she is aware that you are a student of Nutrition and Food technology. She desires that when you meet, you prepare a special meal for her and the friends who are Bagishu, what special meal would you plan for this occasion?
- Share with your friend, neighbour or family members about the feeding habits of different cultures. Note down in your book the different feeding habits discovered.

Factors affecting feeding cultures of different people

Every tribal group in this country has its own traditional dishes that they value as discovered in the previous activity. For you to understand these factors affecting the feeding habits helps you appreciate our individual differences. This makes you a unique person who respects others.

Activity 2: Factors affecting feeding cultures of different people

- Identify the members earlier asked in your family, neighbourhood or friends from different cultural backgrounds.
- Discuss with them the reasons that could be the cause of the difference in their feeding cultures with other people
- Take note of them,
- What moral lessons have you learnt from the individual differences of feeding habits?

Summary

The feeding habits vary according to

- Families
- Cultures
- Age groups

Below are some of the traditional considerations of some of the foods consumed in the different families and cultures in Uganda.

- **Luwombo** for the Baganda
- **Eshabwe** for Banyankole
- **Firinda** for Batooro
- **Malewa** for the Bagisu
- **Malakwang** for the Acholi.
- **Sweet potatoes** for the Basoga
- **Matooke** for Baganda, Bagisu and Banyankole.
- **Kalo** for the west, East and Northern region.
- **Sombe** is a special delicacy among Bakonjo of western Uganda.

The following are determinants of what you eat and why different people value the foods they eat

- Presence of food
- Nutritional knowledge
- Money available to buy the food
- Addiction to drugs and alcohol
- Climate of the region
- Individual preferences
- Emotions
- Religious beliefs
- Taboos

Glossary/Key words

- Nutrition
- Food
- Feeding habits
- Culture
- Diet
- Meal
- Hygiene

References

- Internet
- News papers
- Oral literature
- magazines

Have you enjoyed the lesson? Continue to appreciate each other's feeding cultures for we live in a diverse world.

Lesson 2:**Learning outcomes**

By the end of the lesson, you should be able to;

a). demonstrate good food and kitchen hygiene practices.

b). Clean kitchen surfaces using different cleaning agents

Study requirements

- Images of cleaning agents
- Actual cleaning agents
- Magazines
- Note book and pen
- Work surfaces
- Cleaning equipment

**Maintaining Food and kitchen hygiene****Introduction**

What do you know about food and kitchen hygiene? Have you ever imagined how important it is in your life?

It is not enough, just to ensure cleanliness of your body. It is also very important for you to observe hygiene when preparing food. Healthy food is directly related to good hygiene. Good food handling and kitchen hygiene frees you cases of food contamination and poisoning.

Many people think that when you suffer from sickness and tummy upset, it is the result of germs picked up from outside the home. In fact, most germs are actually picked up in the home. This is a direct result of poor kitchen hygiene, with germs from raw foods being transferred to kitchen surfaces or other foods.

Avoid germs in the home by following the **four Cs** of food safety: Avoiding Cross-Contamination, Cleaning, Cooking and Cooling.

Activity 1: Maintaining a good standard of food and kitchen hygiene.

- **Your auntie is coming to visit you at home. She wants to work with you in the kitchen. You are supposed to prepare lunch for her.**
- **Think about the practices of kitchen hygiene and food hygiene that you will need to**

put into action.

- **Note them down in your book.**

Cleaning kitchen surfaces using different cleaning agents



The kitchen surfaces are made up of different materials. This calls for use of different cleaning agents in order to maintain them in proper conditions.

Preparing and cooking food is a process that goes through several steps and involving the use of different surfaces for food to get to the table. You need to appreciate that all these areas and surfaces of food handling should always be kept clean to ensure preparation of safe food.

Some of the common cleaning agents include, bar soap, ash, ground, charcoal liquid soap, scouring pads among others. What other cleaning agents can you think about? Which materials of kitchen surfaces do you have at home?

Activity 1: Cleaning kitchen surfaces using different cleaning agents:

- Clean the following surfaces at home
 - i) A wooden table which has been used to cut meat or cut fruits.
 - ii) A concrete floor on which charcoal dust has poured
- Note down the procedures taken.

Activity 2: Using different types of cleaning agents

- Look around home or visit any nearby super market in the detergent section and identify some of the cleaning agents that are used at home and what surfaces they clean.
- Take note of them in your notebook.

Summary

Points to observe in maintaining food hygiene can be summarized as below:

1. Always wash your hands before and after handling food.
2. Ensure cuts and sores are covered with plaster before handling food.
3. Keep yourself clean and put on protective clothing.
4. Never cough, sneeze, spit or smoke over food.
5. Do not lick fingers and spoons and then use them to handle food.
6. Always use tongs, forks and spoons to handle cooked foods, fruits and vegetables. You should keep your hands off food as far as possible.
7. Use clean equipment for preparing and serving food.
8. Keep food protected from flies, pests and rodents.
9. Waste food should be disposed of in the right way.
10. Make sure that all frozen foods are thawed well before cooking.

11. Prepare raw and cooked food in separate containers to prevent cross contamination.

Points to observe to maintain kitchen hygiene

1. Wash and clean work surfaces, cooking place and the floor.
2. Utensils and equipment used should be kept clean.
3. Avoid pets like dogs and cats in the kitchen.
4. Thoroughly wash the kitchen clothes and dry them well.
5. Use each type of kitchen cloth for the right purpose.
6. Wipe spills as soon as they occur.
7. Use hot water, a good detergent for washing dishes and cleaning the kitchen to remove all traces of food.
8. Disinfect the rubbish bins and the washing areas regularly.

Common cleaning agents

- Water, the most common cleaning agent, which is a very powerful polar solvent.
- Soap or detergent.
- Ammonia solution.
- Calcium hypochlorite (powdered bleach)
- Citric acid.
- Sodium hypochlorite (liquid bleach)
- Acetic acid (vinegar)

Acidic

Acidic cleaning agents are mainly used for removal of inorganic deposits like scaling kettles and pans. Often, surfactants and corrosion inhibitors are added to the acid.

They can be used, for concrete, to unblock clogged pipes by dissolving greases, proteins, and even carbohydrate-containing substances such as toilet tissue.

Alkaline

Alkaline cleaning agents contain strong bases like sodium hydroxide or potassium hydroxide. They can dissolve fats (including grease), oils, and protein-based substances.

Scouring agents

Scouring agents are mixtures of the usual cleaning chemicals (surfactants, water softeners) as well as abrasive powders. The abrasive powder must be of a uniform particle size.

All-purpose cleaners

All-purpose cleansers are effective with most common kinds of dirt. Their dilute solutions are neutral or weakly alkaline, and are safe for use on most surfaces.

Detergents

Detergents are substances containing soaps and/or organic substance or mixture that are used for washing or cleaning jobs for the household, institutional or industrial purposes.

These include:

There are many cleaning products containing detergents and they come in various forms, including powders, tablets, concentrated liquids, liquid capsules, pastes or cakes.

Abrasives

Abrasives are either powders or liquids used to wear off dirt from hard surfaces such as sinks, floors, and kitchen and bathroom surfaces.

Glossary/Key words

- Abrasive
- Detergent
- Food hygiene
- Kitchen hygiene
- Scourer
- Alkaline
- Acidic
- Surfactants

References

- Internet
- News papers
- Oral literature
- magazines

Hope you enjoyed the lesson. Stay blessed!

Summary of Topic 1

In this chapter, you have learnt the:

- Influence of food habits and practices in determining nutrition practices.
- Importance of living and working in a clean and healthy environment.

TOPIC: KITCHEN EQUIPMENT AND PLANNING

By the end of the topic, you should be able to;

- a). Use kitchen equipment correctly.
- b). Care for kitchen equipment appropriately.
- c) Store equipment correctly
- d). Make use of appropriate technology.
- e) Plan and sketch a kitchen lay out.
- f) Discover the safety aspects when planning a kitchen.

Lesson 1: Use and Care of Kitchen Equipment



Learning Outcomes

In this lesson, you should be able to:

- a). Use kitchen equipment correctly.
- b). Care for kitchen equipment.

Study requirements you will need

- The kitchen
- note book
- pen
- Kitchen equipment

Instructions

As you go through this lesson, there is need to;

- make an effort to see the various equipment physically for a better understanding of the topic if you can.

Introduction

Have you ever bought an item for yourself and within a short time, you find it spoilt by another person? This feeling would be too bad for you. In the same way, when your parents buy equipment at home, or even your teachers at school, they desire to see that the purpose they are meant to serve is fulfilled and there is need to use them safely and appropriately.

Activity 1: Using the kitchen equipment.

- Collect a sample of different types of equipment that you use at home in the kitchen.
- Suggest a suitable name given to the equipment
- Note down the names and suggest the correct functions that they perform.
- Share with the family members and discuss the precautions to take note of while using these kitchen equipment.
- Note them down.

Care for kitchen equipment.

You know very well that; all things need care for a longer shelf life just like us human beings. You need to give the proper care to kitchen equipment during cleaning and handling to maintain them in good working conditions.



Activity 2: Care of kitchen equipment

- Choose any equipment of your choice, demonstrate to one of the family members the care it should be given.
- Take note of the procedures followed.

Summary

Care for different kitchen equipment

Stainless steel

- Use boiling soapy water and let it soak for some time.
- Once it's ready for scrubbing, use a non-abrasive scrub with no bleach.

Wooden tools

- Avoid soaking your wooden kitchen tools in water for too long.
- Make sure you wash them immediately and let it dry.
- Avoid banging them.

Plastic equipment

- Avoid using harsh abrasives
- Keep them away from intense heat.

Key words

- Bang
- Abrasive
- Kitchen equipment.

References

- Text books i.e. foods and nutrition with science in the Home
- Oral literature
- Internet

“A smart kitchen for smart food”. Stay blessed

Lesson 2: Storing Kitchen equipment and the use of Appropriate technology

Learning Outcomes

In this lesson, you should be able to:

- a) Store equipment
- b). Make use of appropriate technology.

Study requirements you will need

- | | |
|----------------------|-------------------|
| • The kitchen | • Nail |
| • note book | • Knife |
| • pen | • Plate |
| • Kitchen equipment | • Carrots |
| • Empty metallic tin | • Hammer or stone |

Storage of equipment



Introduction

Keeping your kitchen equipment in the appropriate place and correct position is very important. It also contributes to keeping it in the safest state to use for a long time.

Activity 1: Storage of kitchen equipment

- Research about the storage tips for several kitchen equipment.
- Take note of them in your book,

Use of appropriate technology

Introduction

Different equipment can be improvised to perform different other functions. Appropriate technology can also be seen in use of alternative fuels. Taking an example that in the absence of an electric oven, a charcoal stove can be used to bake using saucepans, sand and a cover.

Making an improvised grater as a form of appropriate technology

Follow the steps below to come up with a grater.

Let's say you are at home cooking, and have everything you need to make your favourite delicious dish except a grater. Don't worry, if you've got a soda or beer can, or empty metallic tin we can grate those vegetables.

1. Empty Can and Punch Holes in One Side



First you need to get a knife or pointed object, or nail to punch through your can.

Then punch holes all over one side of the can.

2. Turn a Few Holes Inside Out

Use your knife to pry out a few holes you made.

The sharp metal will be the part that shreds the vegetables so do this near the top of your can.

3. Cut Bottom of Can Off



Now cut the bottom of your can off.

These is where the shredded vegetables will come out once it has gone through your grater.

4. Start shredding

Activity 2: Appropriate technologies

- Identify other different ways of improvising equipment to perform different tasks
- Write out the tasks
- Research about how to come up with a good oven to be used on a charcoal stove.
- Set it up and use it to bake any item of your choice

Other examples of use of appropriate technology include the following;

- making a dredger out spices tins,

- Grater from a metal tin and nail
- A fork to whisk

Lesson 3: Kitchen Plans

Learning outcomes

In this lesson you should be able to

- a) Plan and sketch a kitchen lay out.
- b) Discover the safety aspects when planning a kitchen.

Materials you need:

- A note book
- Pen and pencil
- Ruler
- Rubber

Planning and sketching a kitchen lay out



An image of a linear /one wall shaped kitchen

Introduction

A kitchen involves arrangement of different major areas where activities are carried out. What are some of those activities?

The kitchen is the busiest place in a home because the activities of the entire household revolve around it. Therefore, its relation to other areas is very important.

When you are planning a kitchen, aim at saving as many steps as possible while moving from one work place to another. Decrease the amount of time you work in the kitchen. Enjoy doing work. Can you think of the major areas which are found in kitchens?

The sequence of areas in the kitchen is from Storage area to Work surface to Wash up area then Cooking area and vice versa. The work areas may be more in a kitchen lay out depending on the space available.

The kitchen plans make up different shapes which are named according to letters in which they come up, they include, L shape, U shape, Linear shape, Parallel

Activity 1: Planning a kitchen

- Your Uncle is constructing a new home in Nansana, he has requested you to share with him ideas to consider while planning his kitchen.
- What suggestions would you have for him? Include guidance on lighting, ventilation, sequencing among others.
- Take note of them in your book.

Activity 2: Sketching out a kitchen lay out

- Your mother is coming back from your farm in Nakaseke, she has brought fresh foods including, fresh bean, mangoes and potatoes, she has asked you to prepare lunch of bean stew and steamed sweet potatoes.
- Which work areas will you make use of in the preparation of the meal? These areas should cover from the time you receive the package to serving time at the dining table.
- Sketch out an appropriate lay out that is suitable for your kitchen to form shapes of, L shape, U shape, Linear shape, Parallel, demarcating the major areas.

Summary

Planning a kitchen

The basic requirements in the kitchen are food preparation, storage and cleaning up activities. You will realise that in most kitchens work revolves around the cooking area, the cleaning up and preparation centre and food storage centre. The cooking area could be a fire place, cooker or stove.

When someone in the kitchen moves from one work centre to another without retracing the steps, this type of movement results in a work triangle.

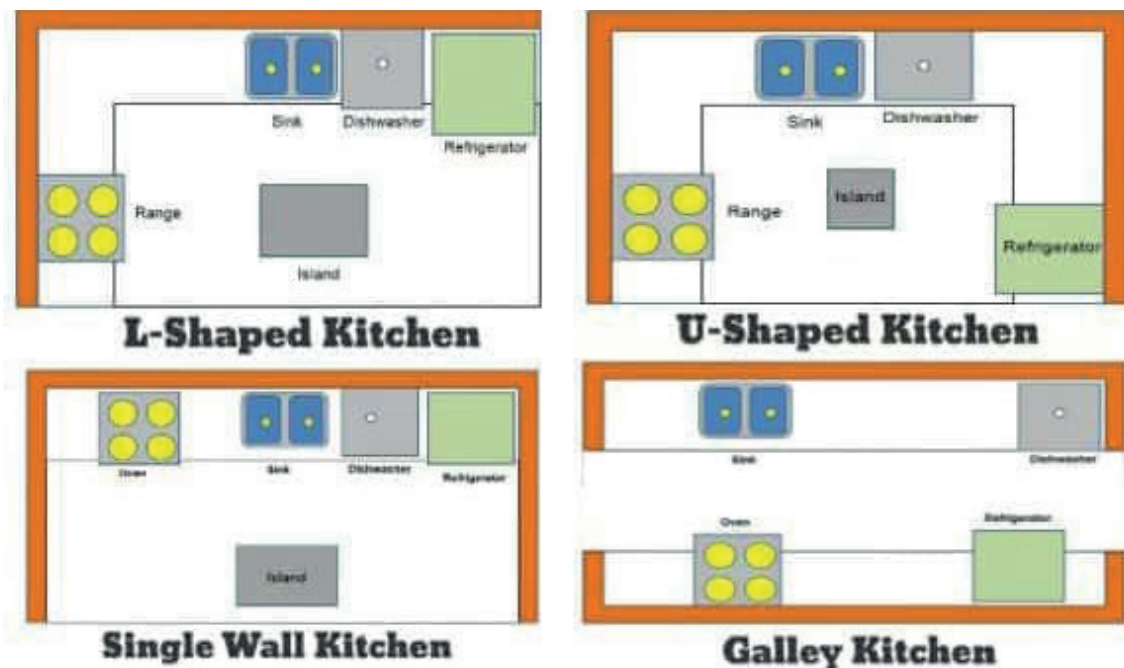
General points to consider planning a kitchen

- consider ways to save time and energy when planning the main work centres.
- Provide adequate space for normal activities in the kitchen and allow a comfortable movement of at least two people working in the same kitchen.
- Ensure enough work space or counter area to facilitate food preparation. These are usually covered with heat proof material.
- Ample storage space on the work centre level e.g. built in cupboards below with drawers. Cupboards above work level are useful but must not be too high.
- The work centre should be at a comfortable height, usually one metre above the floor.

- Safety and comfort should be a major consideration. Organise work centres so that there will be minimum discomfort and fatigue.
- There should be adequate lighting of the right intensity. There should be enough light in the day and night. Each work centre must be well lit for activities that go on there.
- The room should be well ventilated to keep it fresh and free from cooking smells.
- The surfaces should be easy to clean and heat proof.
- There should be provision for waste disposal in and outside the kitchen.
- The overall appearance should be clean, fresh and cheerful.
- When equipping the various areas of the kitchen, remember there should be a proper place for everything.

Kitchen lay outs

Usually the efficiency of the kitchen is influenced by the shape as this determines the arrangement of work centres. The shapes commonly used for kitchen plans include one wall plan, corridor plan, L- plan and U- plan.



One wall plan

This type of kitchen is suitable where space is limited for instance in one room flat. The work flows in a straight line from the work centres i.e. the storage, work area, the washing area and cooking area.



L- shaped kitchen lay out

This is suitable where there is plenty of space. Equipment is arranged on the two adjoining walls and so quite close to each other.



U shaped

A U- shaped kitchen design features three walls that are lined with storage areas and appliances. It is an efficient design that frees up kitchen space. It has an efficient work triangle and is considered the most convenient arrangement.



Corridor /Parallel lay out

The corridor consists of two walls arranged in a corridor shape with both ends of the corridor open.

**Key words**

- Kitchen
- Kitchen lay out
- Work triangle

References

- Text books i.e. foods and nutrition with science in the Home by F. Tindamanyire
- Internet
- Oral literature

Hopefully it was such a good moment for you in the lesson.

TOPIC: SAFETY IN THE HOME

Learning outcomes

By the end of this topic, you should be able to;

- Discover the causes of accidents
- Suggest measures of prevention of accidents.
- Find out the relevance of good lighting and ventilation.
- Discover the suitable choice of work surfaces
- Discover various water sources and purification

Lesson 1: Causes and prevention of accidents

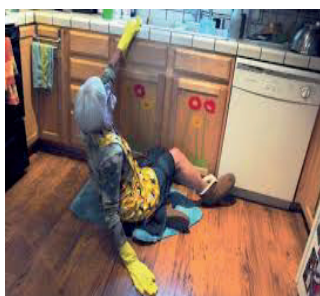
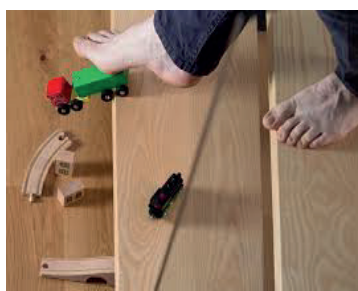
Study requirements

- Note book Pen
- First aid box

Instructions

Ensure that you follow the lesson step by step ensuring that all activities are done.

Causes of accidents



Introduction

More often than not you have seen people being injured or losing lives by accidents that occur in the home. You have seen that this mostly happens if you do not take care of yourself and other people.

Many times accidents are caused by untidiness, carelessness, inadequate light, not looking ahead, not having your mind on the task at hand, faulty equipment, rushing or panicking. Am quite sure you have once been in such a state.

Activity 1. Causes of accidents

1. List down in your book the common accidents that normally occur in your home.
2. Suggest several ways of how you can prevent at least five of the accidents you have listed down.

Prevention of accidents

The long term solution to injury is prevention. The major responsibility of accident prevention is not only with the medical profession but with you as an individual,

It is advisable to have a first aid kit at home as well as a book on simple first aid at home.



You are going to ensure that you get one for your home.

Activity 2: Prevention of accidents

- Discover several ways in which you can prevent accidents in your home in regards to the following areas
 - a) Kitchen
 - b) Bathroom
 - c) Compound
- Take note of them in your book,

Summary

The following are some of the ways you can generally safeguard yourself against accidents

- Keep all medicines, drugs and tablets in locked cupboards or out of reach of children.
- Dispose of all unwanted medicines and tablets.
- Label all medicines bottles clearly.
- Never allow children to play with match boxes or burning wood.

- Keep sharp pointed articles and knives out of reach of children.
- When hanging curtains or pictures stand on a chair or table that will support your weight or use a strong ladder.
- Keep floors dry
- Always turn off gas taps and knobs of electric cookers after use.

Key words

Safety, First aid, Accident, First aid box

I hope you have enjoyed the lesson.

Lesson 2: Lighting and ventilation

Learning outcome

In this lesson you should be able to

1. Find out the importance of good lighting and ventilation

Study requirements

- Note book, pencil and pen
- Manilla paper and marker

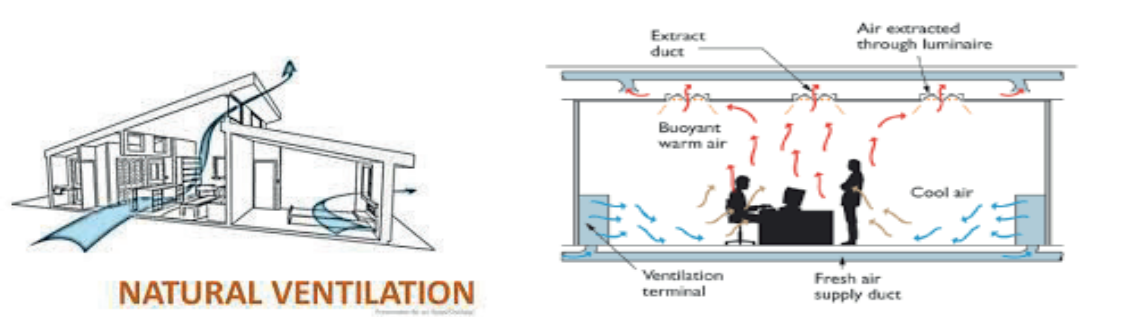
**Introduction**

Fresh air and sunlight are essential for a healthy home. Why do you think it is important?

You are able to see things because of light. The quality of light is also important. The quality of light does not just involve the amount and type but also the lighting equipment, surfaces like the walls, ceilings, floor, furniture and objects in the room. It also involves the colour, texture, finish and size of these surfaces and objects. Light has qualities that affect the mood of people and atmosphere of a home. For you to perform well in your tasks it is important to control the quality and quantity of light in a room.

Activity 1: Relevancy of lighting

1. Discuss with your family members the importance of lighting in the home
2. Take note of them in your book.

Ventilation

Proper ventilation is vital to your family's comfort and health.

Imagine you are in the kitchen cooking on a charcoal stove, with windows and doors closed. What would be your experience? The process of exchanging the air in the room is known as ventilation.

Kitchens, bathrooms, toilet are the biggest sources of moisture and odours in the home. To keep moisture and heat out of your home, adequate ventilation is very important.

Activity 2: Relevance of ventilation

1. Design a poster on sensitization message on the relevance good ventilation in a home.

Summary

Light contributes to the following

- the general appearance of a space.
- Gives emotional satisfaction.
- Keeps our eyes healthy physical health
- Creates a comfortable working environment
- Comfort
- Safety of the individual using it.

Good lighting requires that

- The amount of light is adequate for the task in question e.g. reading, sewing, cooking
- It is well distributed, adequate in all directions
- It is without glare i.e. causing eye strain.

Some of the key benefits of ventilation

- Prevention of condensation
- Reduces the occurrence of common respiratory problems
- reduce the risk of a number of health issues like asthma, allergies, and headaches

- Prevents fatigue
- Provide a conducive environment.

The following are factors to ensure adequate ventilation

- Air space needs to be sufficient enough for each person so as to allow enough dilution of carbon dioxide.
- Air must keep moving constantly to freshen up space and remove smells and moisture.
- Temperature of the air must be such that it is neither too damp nor too dry.

Key words

- Lighting
- Ventilation
- Condensation
- Glare

Lesson 3: Work surfaces

Learning outcome

In this lesson you should be able to;

1. Discover the suitable choice of work surfaces.

Introduction

Work surfaces are used constantly, fresh foods are placed on them, sauces are spilled on and vegetables are chopped on them. A work surface is the work horse of the kitchen the backbone of all activities the go on there.

Do you wish to know which work surfaces you would want to have in your dream home? This lesson will help guide you make the proper choice

There are various types of work surfaces used in the home for example marble, stone, Formica, wood, glass, concrete, stainless steel.

Activity 1: Suitable choice of work surfaces

1. Inquire from your family members the choice of work surface they would desire, giving their reasons for choice.
2. Take note of their feedback.

Summary

Qualities of a good work surface

- Should be easy to clean or disinfect
- Washable
- Made of non-toxic materials.
- Must look beautiful
- Being practical and hard wearing
- Smooth
- Non absorbent
- Heat resistant
- Water resistant

Let's look at the different types of work tops on the market, you can choose from

- Granite – it's a highly popular stone. Its stylish, luxurious, durable and functional but can't be repaired once damaged and quite heavy,



- Quartz – a man-made stone, has the durability of natural stone. Its stain resistant. Available in many colours and textures. Can't handle too much heat.



- Ceramic- versatile and hygienic. They have a beautiful, elegant look but can also be given a unique look with the addition of decorative tile pieces. They are cheap and don't require replacement for years. They have an uneven surface and are prone to scratches. They can scratch if you drop something very heavy on them.



- Glass- it gives a modern statement. It's very durable as well as heat and water resistant. It doesn't allow the build-up of stain or mould, making them hygienic. Despite their strength, they can crack if excessive weight is placed on the corners. The surface can be damaged with highly acidic food content. It can be fairly expensive when compared to granite and quartz.



- Corian/ Terrazzo ; It's a solid surface material made by mixing plastic resin and bauxite pigments. Once created it is bound to a timber substrate to create a solid surface worktop. its non- porous, making it hygienic and dirt/ bacteria resistant. They collect small abrasions and scratches with time. They are less heat resistant



- Wood- they are usually unique because they develop a character and even greater aesthetic appeal over time. They improve with age, they are solid, naturally resistant to germs and bacteria. They a cheaper alternative but require regular maintenance to keep them in good condition. They need to be oiled regularly to avoid permanent damage caused by water. They can't with stand heat from hot pans and dishes.



- Laminate- they are made of high density chipboard and the coated with plastic laminate. They come in varieties to choose from such as matt, high gloss. They are also laminate worktops that mimic other effects such as granite and wood.
- They are cheap and affordable. Their water proof surface makes them easy to clean. They can be damaged by sharp or heavy objects. Hot pans can leave scorch marks on the surface.



- Stainless steel- they are highly heat resistant and durable, making them the ideal choice for kitchens with heavy cooking. They are easy to clean and maintain. They are non-porous which means they won't stain or harbour germs. They are also water resistant. They are not scratch- free and with time accumulate many scratches. Without proper care,



they acquire dents. They can be noisy.

One needs to take time in choosing the best kitchen worktop for a home. As you can see, each type of work top has its pros and cons, so you should know exactly what work top fits your requirement before you make a purchase.

Key words

Work surface, Corian, Marble, Ceramic, Quartz, Laminate, Granite, Stainless steel

“Good luck in making your best choice of a work top”

Lesson 4: Water

Learning outcome

In this lesson you should be able to:

1. Discover various water sources and purification

Materials you need

- A note book
- Pen and pencil
- Water purification equipment

Introduction



Water is very essential to life because all living things must take in a certain amount of water regularly in order to survive. Likewise, in your home, water is used for cooking, drinking, washing up, removing waste, cleaning and many other activities. It is got from different sources.

Activity 1: Sources of water

- Look around your community and outside, suggest the different places where people get water from.
- Take note of the sources.

Purification of water

The different sources of water give us varying qualities. This calls for water purification in order to make it safe to consume. Purifying your water at home does not have to be complicated or expensive. Water purification is a process of removing undesirable chemicals, biological contaminants and suspended solids and gases. The main aim of water purification is to produce

water fit for specific purposes. Have you seen or heard about people who carry out water purification processes?

Activity 1: Purification of water

1. Share with your family members the different ways of purifying water. Take note on them.
2. Practice and Assemble/set any method of water purification and carryout purification of water.
3. Observe the product.

Summary

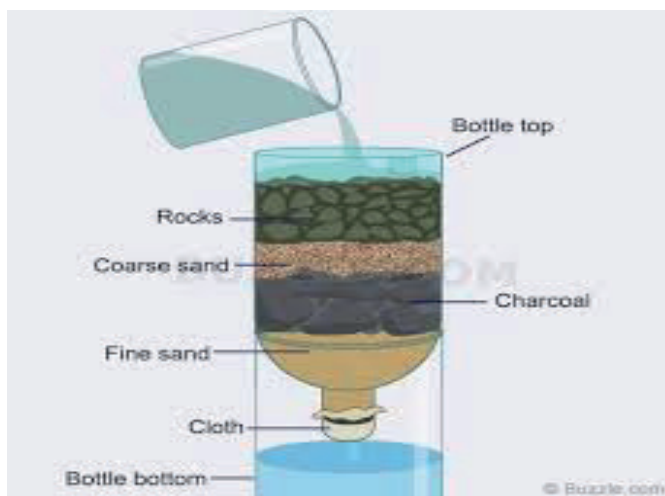
Sources of water

We get water from rivers, lakes, wells, bore holes and collected rain water. Most big towns get their water from a central supply system.

Water from rivers and streams is most likely unsafe for use. It is normally polluted by silt, decomposing plants, mud, feaces, dissolved minerals and many other things. Water borne diseases are common in communities where water from streams and rivers is used. If such water is used for domestic purposes care should be taken to prevent pollution. The area around the supply should be protected from animals and people who are likely to contaminate the water.

Water purification

The following are ways of purifying water



- Boiling: allow water to settle and pour it into a clean saucepan, leaving the sediments behind. Boil it for about ten minutes all disease germs. Let it further stand for ten minutes as some of the sediments fall to the bottom. Then pour slowly into a clean container and store it safe for drinking.
- Filtering: boiled water may be filtered before drinking. Filtering helps to get rid of particles of impurities in the water.
- The use of iodine solution, tablets or crystals: it has the ability to kill viruses and bacteria. It takes about thirty minutes before you can drink the treated water. Once you drop the

tablet into the container, shake the container and hold the bottle upside down and have the lid slightly unscrewed to let the iodine to flow into the reads of the bottle cap.

- Use chlorine drop: chlorine has the ability to kill bacteria in water. You have to wait for thirty minutes before you can drink the treated water. Make sure not to put too many drops as it could be poisonous if used to much.
- Use water filter: water filters can remove bacteria in water. Carbon on the other hand gets rid of the chemicals and awful tastes while iodine coated screens can further remove viruses.
- Use ultraviolet light: this looks similar to a small flashlight. You just swish it around in the water for a few minutes and the bacteria can already be killed.
- The sun: clean or filtered water should be put into a clear glass container and kept in the sun for a minimum of six hours, and the solar radiation and heat will destroy any pathogens that can cause water borne illnesses.
- Charcoal filter: You need to have a container with a discharge tap at the base a clay pot or enamel bucket in which graded layers of clean stones, gravel, sand and broken charcoal are arranged. As the water filters through, suspended solids and impurities are trapped and clean water is tapped out of the base. The charcoal is to remove odour. You can make tiny holes in the base of the filter pot /pan and stand it on top of a clean container. The filtered water will seep into the lower vessel, and in this arrangement the discharge tapis fitted to the bottom container.

Caution: you must clean the filter and renew the filter beds often as they soon become clogged. Its best to boil the filtered water before drinking.

Summary

The learner should be able to

- Prevent accidents at home
- Appreciate the importance of proper lighting and ventilation
- Choose and use proper work surfaces
- Know the importance of clean water.

Key words

Accidents, ventilation, contamination, purification, First Aid, work surfaces, pollution

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TOPIC: PROTEIN



Learning outcomes:

After going through the activities in this topic, you should be able to;

- state the sources and functions of proteins
- understand how proteins need to be prepared and cooked so that they form part of a healthy diet
- manage the effects of an imbalanced intake of proteins in the body
- understand the characteristics of protein

Materials you will need:

- a note book
- pencil
- pen
- some plant and animal protein foods
-

Lesson 1: Sources and functions of proteins

By the end of this lesson, you should be able to; state the sources and functions of proteins.

Instructions/Directions:

Find a suitable place and time to read this material. Attempt all the activities given. In case you need to consult family members, feel free to discuss with them. Some activities may require your parents to provide materials and ingredients for you. Remember that some activities may need more than 1 hour to complete them. Follow the instructions that you have been given carefully before doing each activity.

Introduction

In your primary school, you learnt about food values. Protein is one of the food values that your body requires. Protein is a basic part of your body cells. It is made up of carbon, hydrogen, oxygen and nitrogen. They may also contain Sulphur and phosphorus in smaller amounts.

Protein makes about 15 percent of your body weight. If you take in less protein, you will suffer from malnutrition. Proteins are the only nutrients which provide nitrogen in your body. Nitrogen is important for cell formation and therefore growth and repair of worn out tissue. Do you know any sources of proteins in the diet?

Protein rich foods



Activity 1.1: List down all the foods that you have eaten for the last 3 days. Identify the animal protein and plant protein foods from the list.

What are the other animal and plant sources of proteins missing on your list?

With reference to your list, do you think that your diet is protein rich or poor?

If poor, what protein foods could be eaten to meet your requirements?

Proteins are made up of amino acids which are the basic building blocks. A protein that has all the essential amino acids is called a complete protein. These are usually from animal sources. A protein that lacks one or more essential amino acids is known as an incomplete protein. These are majorly plant sources.

Your body uses proteins for many different things, including;

- Repair of worn out tissues.
- Maintain cell growth in the formation of new body tissue.
- Aid in the formation of enzymes, some hormones and anti-bodies.
- Provide energy if carbohydrates and fats eaten are not enough in the diet.

Activity 1.2 What do you think could happen if proteins are lacking in the diet?

Summary:

In this lesson you have found out that;

The sources of proteins are from plants and animals' foods. Proteins that have all the essential amino acids are called a complete protein. Proteins that lack one or more essential amino acids are called incomplete protein.

The functions of proteins are; growth and repair of worn-out tissues provision of energy and make hormones, enzymes and antibodies.

Lesson 2: Preparing and cooking protein foods to form part of a healthy diet:

Learning outcome;

By the end of this lesson, you should be able to prepare and cook protein foods to form part of a healthy diet

It's important to have a variety of foods to make sure your body gets all the essential amino acids. There are two ways of making protein complete. This is referred to as supplementary/complementary proteins.

- i) By combining plant and animal food
- ii) By combining plant proteins from a variety of cereals and grains

For example; i) rice and fish ii) beans and posho.

Hint: If you eat a good mixture of vegetable proteins, you will get all the essential amino acids. Vegetarians who do not eat animal protein whatsoever can stay fit and healthy on this type of diet.

Activity 1.3:

- i) List 3 different combinations of plant and animal foods
- ii) List 3 different combinations of plant proteins from a variety of cereals and grains
- iii) Prepare and cook a meal for your family using one of the complementary proteins in your list.

Summary:

In this lesson you have learnt to prepare and cook proteins foods to form part of a healthy diet. A good mixture of vegetable proteins will provide all the essential amino acids that your body requires.

Lesson 3: Managing the effects of an imbalanced intake of proteins in the body:

Learning outcome;

By the end of the lesson, you should be able to;

Manage the effects of an imbalanced intake of proteins in the body.

Protein deficiency may result to kwashiorkor which is characterized by;

- loss of weight, tiredness and loss of energy
- loss of appetite
- swelling of limbs
- brown sparse hair
- moon face and sunken eyes
- stunted growth in children.
- lowered body resistance to disease
- liver damage and eventually death

Activity 1.4: Your neighbor who is a hairdresser has a 5-year-old boy. During the Covid lockdown, their food ratio has greatly reduced. The boy has developed brown hair, swollen belly, a moon face with swollen limbs.

- i) Identify the condition that the 5-year-old boy is suffering from.
- ii) Mention the foods that would be required to correct the above condition in the 5-year-old child in your neighborhood.

Summary:

You have learnt how to identify the deficiency symptoms. You have also discovered the sources of protein. These can be used to manage the effects of an imbalanced intake of proteins in the body (Kwashiorkor).

Lesson 4: The characteristics of protein

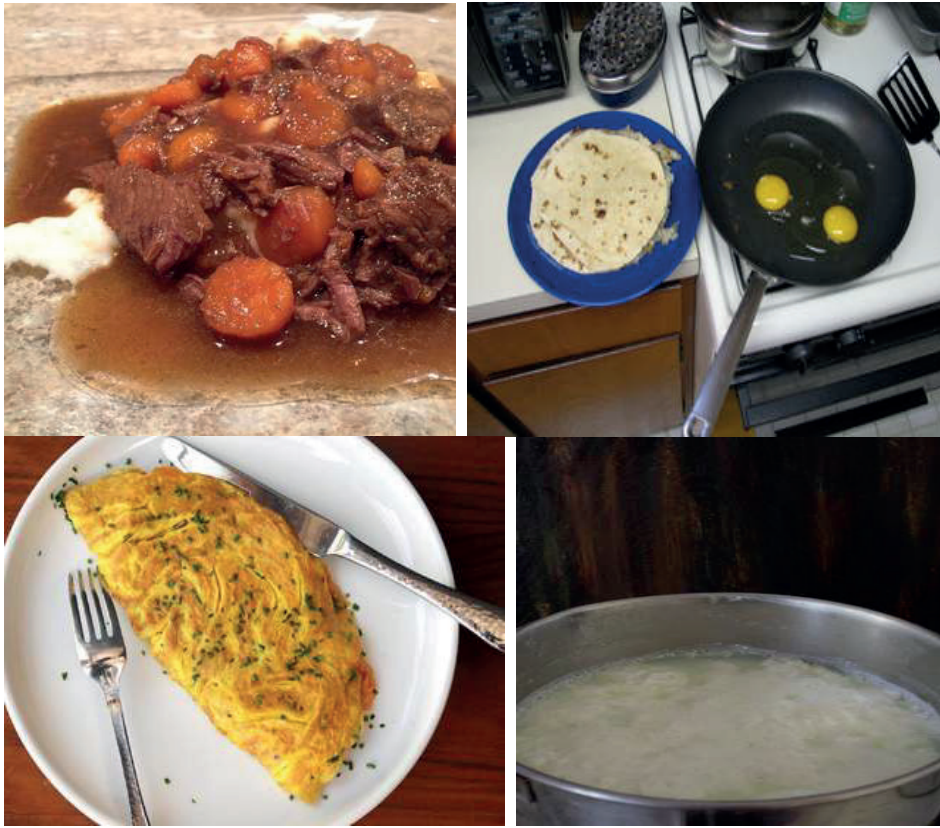
Learning outcome:

By the end of this lesson, you will be able to:

- explain the characteristics of protein

Proteins are denatured by untwisting the protein molecule, causing loss of structure and function. This change cannot be reversed. The changes are caused by heat, whipping or shaking, addition of acids, alcohol and alkalis.

Changes that occur in protein; what are some of the changes that you can observe in the pictures below?



Activity: Explaining the characteristics of protein

Materials needed;

You will need:

- Egg
- Folk/egg beater
- Plate
- Frying pan/saucepan
- Egg turner/folk
- Milk
- Lemon/vinegar
- 1 teaspoon cooking oil
- note book
- source of heat (fire place, charcoal stove, gas cooker, electric cooker)

Procedure:

Step 1: Break an egg on a plate and beat/whip with a folk/egg beater.

What do you observe?

Step 2: Add cooking oil in a frying pan and heat it up.

Pour the egg that you had beaten in step 1 into the heated pan.

Fry until cooked, serve on a plate.

Identify the changes that have taken place in the egg

Step 3: Get $\frac{1}{2}$ cup of milk and add 2 tablespoons of lemon juice or vinegar.

Mix well and observe the changes that have taken place. Write these in your book.

Wash up all the equipment you have used, dry and store well.

Follow up activity:

Follow the procedure below to make egg custard sauce (eggs as a thickening agent):

Ingredients required:

500ml milk

2 eggs

25g sugar

Method/procedure:

1. Heat the milk but do not let it boil.
2. Beat the egg and sugar together and then add the warm milk while stirring
3. Put on low heat and continue stirring until thick (coats on the wooden spoon)
4. Taste and serve.

Summary:

In the above activities, you have looked at the characteristics of protein. Do you realize that;

- Beating/whipping causes breakage of cross linkages in the egg.
- Heat causes denaturation of the protein making the eggs to become opaque and solidify.
- The acid causes the milk to curdle. All these changes are irreversible.

Glossary

Amino acids_ these are organic compounds that combine to form proteins.

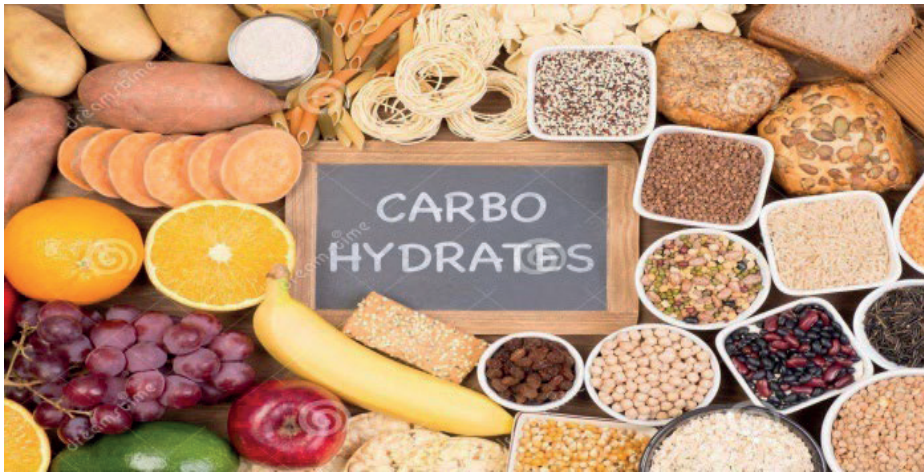
Malnutrition- refers to deficiencies, excesses or imbalances in a person's intake of nutrients.

Denaturation- Is the loss of shape by proteins through external stress like applying heat, beating, acids, alkali.

Curdle-to become thicker or form curd.

Imbalanced intake-this is the taking in of more or less nutrients than the body requires for its metabolic reactions

TOPIC: CARBOHYDRATES



Learning outcomes:

- understand the sources and functions of carbohydrates
- manage the effects of an imbalanced intake of carbohydrates in the body
- understand the characteristics of carbohydrate foods
- Make, pack, cost and sell snacks

Requirements you will need:

- Time
- Note book
- Pen pencil
- Some carbohydrate foods

Instructions/procedure

This material has been developed as a self-study material. You can use this material at your own pace at home. You have already covered other nutrients. Now you are going to learn carbohydrate as another nutrient. Read the instructions provided carefully and attempt all activities that have been given.

Glossary:

Caramelisation- is a type of non-enzymatic browning which involves the removal of water as steam and the breakdown of the sugar.

Dextrinisation- is the process involving the browning of starch foods when subjected to dry heat.

Gelatinization- is the process where starch and water are subjected to heat, causing the starch granules to swell.

Crystallization-

Monosaccharides-

Disaccharides-

Polysaccharides-

Lesson 1: Sources and functions of carbohydrates

Introduction:

You can use carbohydrates in combination with other nutrients to plan a healthy diet. Carbohydrates are made up of the elements carbon, oxygen and hydrogen. Unlike other nutrients, this is abundant and cheap in your community. There is a tendency to eat more carbohydrates than the body needs, this may result to obesity. Most of the carbohydrates are broken down into glucose before entering your blood stream. Carbohydrates exist as starch and sugar in plants. Most carbohydrates are staple foods in the community.

Hint: Roughage is not digested by the human body but helps digestion.

Activity: 1.1

Use available foodstuffs in your home and sort out carbohydrate foods. Write these down in your note book.

Carbohydrates play important roles in your body and these are:

- Providing heat and energy to the body
- Roughage helps in digestion of food
- Cellulose when eaten gives a feeling of fullness
- Carbohydrates have a protein sparing action on proteins. This means that the body can utilize protein for growth if it has enough carbohydrates.

Activity 1.2: Write down in your note book the activities that you do at home that involves the use of energy.

Summary:

In this lesson you have learnt that carbohydrates are abundant and cheap in your community. They are used to provide the body with energy, to give a feeling of fullness and to aid digestion.

Carbohydrates are mainly found in plants in the form of sugar and starch.

Lesson 2: Effects of an imbalanced intake of carbohydrates in the body

Learning outcome;

By the end of the lesson, you should be able to manage the effects of an imbalanced intake of carbohydrates in the body.

Study requirements you may need:

- Time
- Note book
- Pen pencil
- Ingredients for preparing meals for marasmus and obese people

Introduction

Carbohydrates are the cheapest source of energy in the body which is used to perform various tasks. Thus lack of carbohydrates can lead;

- to body weakness
- loss of stability
- loss of body weight
- marasmus results due to lack of carbohydrates and proteins in the body. This is a condition of Protein Energy Malnutrition which occurs during starvation.

Hint: Overconsumption of carbohydrates increases dental carries, large amounts of sugar brings about gastric ulcers and causes loss of appetite.

Excess carbohydrates are converted into fat and stored under the skin. This causes obesity.

Picture of marasmus child and obese child



Activity 1.3

What are the carbohydrate requirements of a person suffering from obesity and marasmus?

Use the sources of carbohydrates that you have learnt to plan and prepare a meal for;

- a person suffering from marasmus
- a person suffering from obesity

Summary:

In this lesson you have found out that low intake of carbohydrate may result to marasmus. Increased intake causes obesity.

It is also important for you to use the knowledge of the sources of carbohydrates to manage marasmus and obesity.

Lesson 3: Characteristics of carbohydrate foods**Learning outcome;**

By the end of the lesson, you should be able to understand the characteristics of carbohydrate foods.

Introduction

Sugar and starch have different properties. These properties are used in cookery to prepare various dishes which you should enjoy at home.

Properties of carbohydrates:**Sugar:**

- i) Disaccharides can be broken down by combining them with water. For example, sucrose is broken down to glucose and fructose. Maltose is broken into two molecules of glucose. Lactose is broken down to glucose and galactose.
- ii) Glucose, fructose and maltose have reducing powers. They remove oxygen from a substance.

Activity 1.4

Identifying the other properties of sugar

Step 1 Get a spoonful of sugar and taste it. What is the taste?

Step 2 Get $\frac{1}{2}$ cup of water and add 2 tablespoons of water. Stir it in the water. **Step 3** Add another 20 tablespoons of water and stir.

Step 4 Heat up a saucepan and add 1 tablespoon of sugar. Heat the sugar for 3 minutes and make your observation. Continue to heat up for another 5 minutes and observe the changes that occur. Heat up the solution for a further 5 minutes and take note.

Hint: Write down your observations from step 1-4 the under properties of sugar.

Caramelization is when sugar turns brown when heated. Carbonization is when sugar turns black, burns on further heating.

Starch

- i) It is not sweet to taste.
- ii) It does not dissolve in cold water.
- iii) It can be broken down to dextrin, then to monosaccharides.
- iv) Dry heat on starchy foods forms dextrin which is a brown coloured compound.
- v) When starch and water are heated, water enters the starch particles. The starch absorbs the water and swells and the liquid becomes thicker.
- vi) At high temperatures, the mixture becomes thicker and sticky due to starch gelatinization.
- vii) Cellulose is indigestible and insoluble in water.

Properties of carbohydrates



Follow up activity to demonstrate some properties of starch:

Step 1 Peel fresh cassava, wash, and cut a piece and taste. What is the taste?

Step 2 Get a slice of bread. Place on top of a wire rack on a charcoal stove/oven. Heat up each side for about 1 or 2 minutes. **OR** roast cassava or potatoes on a charcoal stove/firewood/oven. What is your observation?

Step 3 Heat up 2 cups of water. Mix 4 tablespoons of millet/maize flour and 6 spoons of water. Pour this into the boiling water, stir well and continue to cook. Observe the changes that take place.

Summary:

In this lesson you have learnt that; sugars and starch each have different characteristics or properties.

These characteristics or properties of carbohydrates are used in daily cookery to prepare many dishes. Caramelization, gelatinization and dextrinization are some of them. The properties are used to prepare dishes like porridge, cakes and bread.

Lesson 4: Packing, costing and selling snacks

Learning outcome;

By the end of the lesson, you should be able to pack, cost and sell snacks

Study requirements you may need:

- Time
- Note book
- Pen pencil
- Ingredients to make snacks

Introduction

Use your knowledge of packing and labeling that you learnt under the topic mineral salts for the snacks that you will make. You can make snacks from the different carbohydrate foodstuffs available in your community. The properties of carbohydrates that you have learnt will be useful to make snacks. If the snacks are for sell, cost them well. This will help you to determine the selling

price. You can use wheat flour, cassava flour, ripe bananas, Irish potatoes, sweet potatoes, cassava, and maize grains etc.

Recipe for mandazi:

Ingredients:

1 cup wheat flour	½ teaspoon baking powder	1 spoon margarine
4 tablespoons milk	1 egg	4 tablespoons sugar
grated rind of 1 lemon	½ litre cooking oil for frying	

Procedure:

1. Measure the flour and add baking powder.
2. Add margarine, grated lemon cover/rind and sugar.
3. Rub-in all the mixture well.
4. Create space at the centre add beaten egg and milk.
5. Mix very well to a fairly soft mixture/dough.
6. Leave to relax for some 10 minutes as you prepare where to fry from.
7. Roll out on a table or work surface using a rolling pin or bottle.
8. Cut using a knife into strips, then into squares.
9. Heat up the oil and fry the mandazi until nice brown colour.

Hint: Cool the mandazi, pack, label and sell; or the family members may eat.

Follow up activity:

You can use other carbohydrate foods to make various snacks. You can make 'daddies', doughnuts, chapatti, baggia, pancakes, queen cakes, scones, biscuits, 'mberenge', chips, etc. Feel free to have a discussion with your family members. Write your recipes in your note book.

Summary:

In this lesson you have discovered that the properties of carbohydrates can be used to make many dishes.

You have learnt how to make, cost and pack snacks. Try out other snacks, these can be eaten at home or sold.

CHAPTER: MINERAL SALTS



Learning Outcomes

After going through the activities in this topic you should be able to;

- understand the sources and functions of mineral elements in the body.
- adjust the diet to cater for common mineral intake imbalances in the body.
- understand the factors that affect the absorption of mineral elements

Lesson 1: Different mineral salts and their functions in the body

Learning outcome:

By the end of this lesson, you will be able to:

- List the different mineral salts and their functions in the body.

Materials you need:

- A notebook
- Pen and Pencil
- Foods rich different minerals

Introduction

Your body contains about 24 mineral salts for body maintenance and good healthy. Some mineral salts are found in large amounts in the body while others are needed in small amounts. Macro minerals are found in larger amounts in the body or they are needed in larger amounts in the diet. These include calcium, chlorine, magnesium, phosphorus, potassium, sodium, and sulfur. Micro minerals are required in smaller amounts they include chromium, cobalt, copper, fluorine, iodine, iron, manganese, molybdenum, selenium, and zinc.

Minerals are found in your body:

- As part of your bones and teeth.
- As part of your body cells like muscles, liver
- As part of the soluble salts in the body fluids.

Mineral salts are inorganic substances found food sources. They are soluble in water therefore they should be cooked in little water which should be consumed.

Activity:1

Discuss with the family members or peer friends the different types of mineral sources required by the body. List them down in your note books.



Can you think of the different food stuffs that contain mineral salts?

Specific functions of different mineral salts in the body

Identify the sources of mineral salts from the above pictures.

If you eat foods with mineral salts it helps your body to be healthy. They regulate your body activities. Daily intake of balanced meals will supply all the mineral salts in the required amounts to your body.

Summary:

In this lesson, you have been able to:
Identify the different mineral salts and their sources in the body.

Macro- nutrients include- calcium, chlorine, magnesium, phosphorus, potassium, sodium, and sulfur. Micro minerals include chromium, cobalt, copper, fluorine, iodine, iron, manganese, molybdenum, selenium, and zinc.

Lesson 2: Common mineral salt intake and imbalances in the body

Learning outcome:

By the end of this lesson, you will be able to adjust your diet to cater for calcium and phosphorus intake and imbalances in the body.

Calcium



Have you thought of the substances that make up your body? In primary you studied about the skeleton did you discover the elements that make up the white structure of bones and teeth?

Around 99% of the calcium in your body is in the bones and teeth. As you grow, calcium contributes to the development of your bones. After a person stops growing, calcium continues to help maintain the bones. It also slows down bone density loss, which is a natural part of the aging process. Calcium also helps regulate muscle movements. When a nerve stimulates a muscle, the body releases calcium. The calcium helps the proteins in your muscle carry out the work of contraction. Calcium is a constituent of many enzymes. Without calcium, some enzymes cannot work well.

The following are good sources of calcium: yogurt, milk, and dairy products, silver fish(mukene/enkejje), green leafy vegetables, breakfast cereals, nuts and seeds.

Activity: Below are pictures of children with some of the defects. These occur when a person takes in insufficient amounts of calcium.

In your community have you got some cases of young children with bent legs like these?



In your notebook write down the defects you notice on the legs

How can we avoid the above situation from occurring in the children?

Phosphorus

Phosphorus works with calcium to help build bones. Some small amounts are found in the tissue and the blood. You also need vitamin D to absorb phosphorus properly.

Your body requires the right amount of both calcium and phosphorus for bone health. Phosphorus also takes part in cell reproduction. It is required for energy production in the body.

The deficiency of phosphorus can cause muscle weakness, fatigue and poor at body exercises.

Prolonged low intakes of phosphorus with low levels of calcium and vitamin D can lead to weaker, softer bones. This causes joint and muscle pain.

Activity: Using the background notes/inquiry based learning identify food sources of different mineral-elements in your body. What are their functions in the body? Write them down in your notebook.

Summary:

In this lesson, you have learnt to adjust your diet to cater for calcium and phosphorus intake and imbalances in the body.

You have looked at the deficiency symptoms and foods you can eat to treat the deficiency.

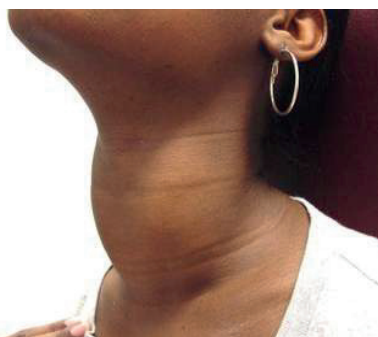
Lesson 3: Iodine and iron intake and imbalances in the body.**Learning outcome:**

By the end of this lesson, you will be able to adjust your diet to cater for iodine and iron intake and imbalances in the body.

Activity: iodine deficiency

Lack of iodine in the diet causes goiter. The following symptoms are seen swelling at the base of your neck. You may experience a tight feeling in your throat, coughing and hoarseness in your voice. You also get difficulty swallowing and breathing. Some children suffer from cretinism; a condition where children are unable to grow normally.

In the pictures below identify the deficiency symptoms of iodine and write the in your notebook.

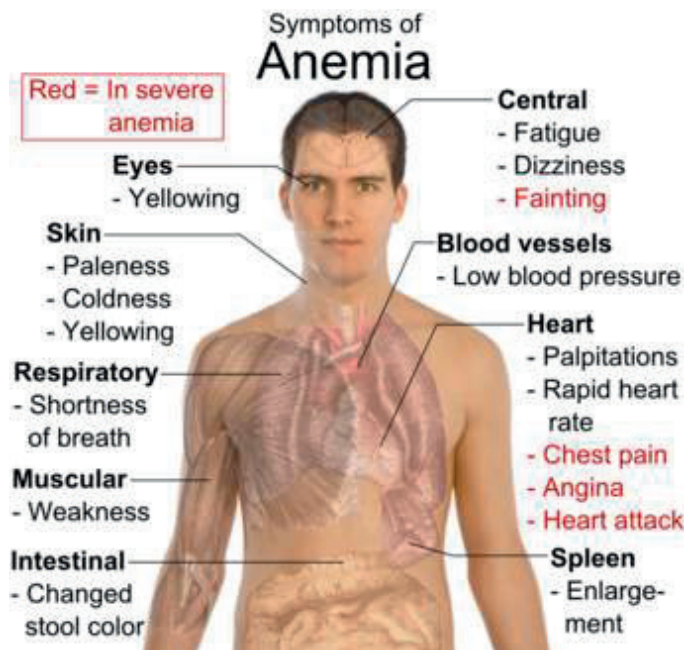


Figures: showing some deficiency symptoms of cretinism and goiter.

How would you avoid the above conditions in your community?

Iron

When you have insufficient intake of iron in your diet, your body fails to produce enough red blood cells. This results in anemia which causes a number of symptoms which progress slowly.



Food shortage in Mukiimbu's family

Mrs. Mukiimbu is pregnant and she has five children in her family. In this covid19 lock down her husband who is a taxi driver abandoned her with the family. She has challenges with feeding the family. For the last three months she has failed to access medical check-ups. Her skin and eyes are pale, she feels weak, dizzy with a short of breath. Her neighbours are suspecting her to be having the corona virus.

As a Nutrition and Food Technology student, can you educate the community about the condition Mrs. Mukiimbu is suffering from; give a piece of advice to her on the foods to eat. Write this in your notebook.

Factors that affect the absorption of the different mineral elements

Mineral salt absorption may vary with your healthy, or age group and physiological status. The form in which the nutrient is may influence the absorption of the mineral salt.

- Protein and vitamin D improve calcium absorption
- Phytates in wheat flour, oxalic acid in spinach hinder calcium absorption.

Follow up activity:

Things required

Saucepan, Spoons, plates, source of heat, knife. Any other equipment according to the dish selected.

Obtain some common foodstuffs in your area which are rich in the mineral salts you have learnt. Prepare a dish using those foods for your family. Take note of this in your book in form of a table.

Name of dish	Ingredients used	Mineral salts obtained
1.		
2.		
3.		

Summary:

In this lesson, you will be able to adjust your diet to cater for iodine and iron intake and imbalances in the body.

A good mixture of food will provide all the mineral salts in your body.

Glossary:

Macro-elements- These are mineral salts required in large amounts by the body.

Micro-elements- These are mineral salts needed in small amounts by the body.

Cretinism- a congenital disease due to absence or deficiency of normal thyroid secretion, characterized by physical deformity, dwarfism, and mental retardation, and often by goiter.

Fatigue- is a feeling of extreme physical or mental tiredness.

Palpitations- abnormality of the heartbeat characterized by awareness of cardiac muscle contractions in the chest

Angina- is discomfort or pressure, usually in the chest, caused by a temporarily inadequate blood supply to the heart muscle.

Phytates- a salt or ester of phytic acid, occurring in plants, especially cereal grains, capable of forming insoluble complexes with calcium, zinc, iron, and other nutrients and interfering with their absorption by the body.

Oxalic acid- a poisonous strong acid that occurs in various plants

TOPIC: PROCESSING AND PRESERVATION OF VEGETABLES

Learning Outcomes

After going through the activities in this topic you should be able to:

- a) Identify the reasons for preserving vegetables and various ways in which they can be preserved.
- b) Explain how vegetables are affected by processing
- c) Sort and blanch vegetables, herbs, and spices (as applicable) in preparation for drying.
- d) Use a solar drier or low temperature oven to preserve vegetables/herbs and spices
- e) Use different methods for reducing vegetables, vegetables, herbs, and spices to powder.
- f) Package, label and sell processed vegetables.
- g) Recipe for chutney, pickles, and sauces.
- h) Developing a recipe for vegetable processing.

Materials you need:

- A notebook
- Pen and Pencil
- Various vegetables
- Saucepan
- Wooden spoon/mingling stick
- Empty bottles for preserved vegetables like tomatoes
- Polythene/muslin for some dried vegetables
- Time
- Good learning environment

Lesson 1: Preservation of vegetables

Introduction

Most natural foods have a limited life span. This includes fresh vegetables grown in our gardens. Do you know the causes of food spoilage? These may include enzymes within some foods. They cause oxidation and rancidity thereby bringing about decomposition. Food spoilage may also be caused by microorganism invasion. You can improve the shelf-life of vegetables through processing and preservation.

Learning outcomes:

By the end of this lesson, you will be able to:

- a) Identify the reasons for preserving vegetables and various ways in which they can be preserved.
- b) Explain how vegetables are affected by processing

Which vegetables are eaten in your home? Are there any ways in which you can make them stay longer without getting spoilt?

There is need to preserve vegetables and various methods have been developed.

The reasons for preserving vegetables include;

- To make full use of the vegetables harvested
- Avoid wastage
- To use up fruits and vegetables when they are plenty
- Add flavor and variety to vegetables
- To facilitate storage, transportation and distribution of food
- To save money by preserving and consuming harvested vegetables

Preservation of vegetables can be done in various ways.



Activity 1.1

Using the pictures above, identify the different forms of preserving vegetables. In your note book, fill your findings in the table below.

Preserved vegetables	Method of preservation

Identify any other preserved vegetables on the market and in your home. In which ways were they preserved? Can you add them onto your list on the table above?

Vegetables are affected by processing in many ways and these include;

- The vegetables keep longer without getting spoilt.
- Taste of the vegetables is changed.
- High temperatures on vegetables may lead to loss of vitamin C and vitamin B which are easily destroyed.
- Processing may also lead to breakdown of cell walls of the vegetables thereby releasing more mineral salts.
- The water soluble vitamins leach into the water used for washing or cooking vegetables during processing.
- Texture and colour of vegetables are lost.
- In some vegetables moisture is lost.

Summary:

In this lesson we have discovered the reasons for preserving vegetables and the ways in which it is done.

This helps us to avoid wastage, make use of our garden produce when in season. It will also ease transportation, storage and transportation of vegetables.

Vegetables are preserved by drying, grinding, canning, bottling, freezing, and addition of chemicals like vinegar, sugar, and salt.

Processing of vegetables may affect colour, texture, nutrients, taste, flavour and moisture content.

Lesson 2: Sorting, blanching and using a solar drier or oven to preserve vegetables

Learning outcomes:

By the end of this lesson, you will be able to:

- a) Sort and blanch vegetables, herbs, and spices (as applicable) in preparation for drying.
- b) Use a solar drier or low temperature oven or sundry to preserve vegetables/herbs and spices

Materials you need:

- A notebook
- Pen and Pencil
- Vegetables for blanching and drying
- Source of heat; solar drier or oven
- Transparent/white polythene
- Tray
- Wooden spoon
- Box (paper/wooden/metallic)/ big saucepan
- Saucepan

Introduction

Drying is one of the methods of preservation. Some vegetables are blanched before drying to preserve vitamin C. It also helps to preserve colour, taste and flavor. This is done by dipping the vegetables in boiling water for a minute. The vegetables are removed and put to dry. Which vegetables are suitable for blanching?

There are different ways of drying vegetables these include; drying in doors or under the shade, solar drying and oven drying.

Drying Vegetables

Requirements/materials

- Tray
- Paper for covering the tray
- A knife
- Selected vegetables

Method:

1. Select, sort and clean the vegetables
2. Blanch the raw vegetables
3. Slice vegetables into bite-size pieces or rings.
4. Cover the tray with clean paper.
5. Place the sliced vegetables on the tray.
6. Place vegetables in a warm room until they are dry.
7. Occasionally check on the vegetables.
8. If most of the moisture has evaporated, it becomes crispy.

Drying tomatoes



Activity 1.2

- Select a vegetable, blanch and use any method of drying to preserve it.
- Write down the procedure in your note book.
- You can use other methods of drying and carry out other ways of drying vegetables.
- You can also use a solar drier to preserve vegetables at home. Improvise using a box (paper/ wooden/ metallic) or a big saucepan. After slicing the vegetables, place in the box or saucepan. Cover with a transparent polythene, fastened with a string. Put your solar drier under the sun.

Summary:

In this lesson we have discovered that blanching helps to preserve colour, taste and flavor of vegetables. It also helps to preserve vitamins.

We can use many ways of preserving vegetables and this include; drying in doors or under the shade, solar drying and oven drying.

A solar drier can be improvised and used at home. A box or saucepan may be used. It has to be covered using material which can allow the sun rays to pass through it.

Lesson 3: Processing vegetables and packaging

Learning outcomes:

By the end of this lesson, you will be able to:

- a) Using different methods for reducing vegetables, vegetables, herbs, and spices to powder or chunks.

Lesson: Packaging, labeling and selling processed vegetables.

Materials you need:

- A notebook
- Pen and Pencil
- Dried vegetables for processing
- Air tight packaging materials
- Tray
- Spoons
- Large containers

Introduction

After drying your vegetables, you can now add value to them. These can be done by crushing, shredding, and grinding into powder or shreds depending on the vegetables.

Hint: Indoor drying conserves the colour and nutrients in green vegetables compared to outdoor drying.

Various value addition methods:



Activity 1.3:

Decide on any value addition method and use it to process your dried vegetables.

Packaging and labeling

It is important to package your processed vegetables to avoid contamination. It helps to facilitate transportation and distribution. Labeling also gives nutritional and other information related to the product.

Figure: Some of the packaging materials



Packaging, labeling and selling processed vegetables.

Hint: Make sure you store the powdered vegetable in bags if you are to store for a long time. Keep in a dry dark place.

Activity 1:4

Have you ever taken time to read the information provided on the packages of produces? Can you look around for any packaging materials at home? Find out the information on them and write them in your notebook, with guidelines from the packaging information below.

Packaging information:

1. The name of the food
2. List of ingredients
3. The quantity of certain ingredients
4. Net quantity
5. Instructions for use (if needed)
6. Indication of minimum durability ('Use by' or 'best before' dates)
7. Storage conditions and/or conditions of use
8. Name or business name and address of the food business operator
9. Place of origin or place where it is manufactured.
10. Food allergens
11. Nutrition information
12. Preservatives added.

Follow up activity:

Pack your processed vegetables in one of the packages include the information required.

Summary:

In this lesson you have discovered that it is important to package your processed vegetables to avoid contamination, to facilitate transportation and distribution. Labeling also gives nutritional and other information related to the product. Various materials are used in packaging but should be airtight and affordable

Lesson 4: Chutney, pickles and sauces**Learning outcomes:**

By the end of this lesson, you will be able to:

- a) Follow a recipe in preparation of chutney, pickles, and sauces.
- b) Develop a recipe for vegetable processing.

Materials you need:

A notebook, Pen and Pencil, different fresh vegetables, Vinegar, Sugar, Salt, Saucepan, Wooden spoon, Packing materials (bottles, containers with covers)

Introduction

You can use chemicals to preserve vegetables apart from drying and freezing them. This may involve use of sugar, salt and vinegar as preservatives. These kill the microorganisms and prevent spoilage of vegetables. Preserved vegetables can be used as accompaniment to meals. Others like pickles may be eaten on their own as they are full of flavour. Below are some recipes of preserved vegetables.

Tomato sauce

10g/1 tsp margarine/butter
 50g/2 small onion
 50 g/2 carrot
 25g/2leaves celery (optional)
 1 bay leaf
 10g/1tsp flour
 5big tomatoes
 375ml stock/ (2cubes beef stock)
 ½ clove of garlic
 Salt and pepper to taste

Method:

1. Melt the margarine/butter in a pan.
2. Chop the vegetables and herbs, brown slightly in the margarine.

3. Grate or chop the tomatoes and mix in the browned vegetables.
4. Add the seasoning to taste.
5. Add boiling stock gradually and stir to boil.
6. Add the garlic and simmer for 1 hour.
7. Correct the seasoning and cool.
8. Pass through a fine strainer.
9. Reheat and pack in sterilized bottles.

Chutney

- 250g fruit mangoes, apples
- 50g sultanas (cake fruits)
- ½ large onion
- ¼ teaspoon, salt
- 50g sugar (preferably brown sugar)
- Pinch of mixed spices
- Pinch of ground ginger
- Pinch cayenne pepper
- 200ml brown vinegar (malt vinegar)

Method

- Wash, peel and chop, the fruit into small pieces
- Peel and chop the onion
- Put all the ingredients in a saucepan of heavy gauge and stew until thick and jam-like in consistency
- Pack in sterilized containers

Hint: While stewing, stir regularly to prevent the chutney from sticking and burning in saucepan.

Pickles (cucumber pickle)

5 pieces of cucumber

3 cloves of garlic, peeled and crushed

2 large fresh dill

1 cup water

¾ cup white vinegar

1 tablespoon salt

Method:

1. Trim ends from cucumbers and slice into spears.
2. Pack into 2 glass jars along with garlic and dill.
3. Make brine in a small saucepan; combine water, vinegar and salt and bring to a boil.
4. Stir until salt is dissolved and remove from heat.
5. Let it cool slightly pour over cucumbers, seal jar and shake.
6. Let it cool completely and refrigerator.

Hint: Keep the pickle for 24 hours before eating for it to become flavourful. Other vegetables may also be used.

Follow up activity:

- a) Prepare any of the above sauce, chutney and pickle following the recipe provided.
- b) You may also try out other vegetables to make sauces, chutney and pickles.
- c) In your note book, write down a recipe for vegetable processing using available vegetables.

Summary:

In this lesson you have found out that you can use chemicals like sugar, salt and vinegar to preserve vegetables. These kill the microorganisms and prevent spoilage of vegetables. Chutney, pickles and sauces are some of the preserved vegetables.

You have also learnt how to prepare preserved vegetables and to develop your own recipe for processed vegetables. These should be carefully packed and well labeled.

Glossary:

Drying- is the removal of water from foods by evaporation.

Blanching- is the dipping of vegetables in boiling water for a minute and removing it and putting in cold water.

Herbs- are plants with savoury or aromatic properties that are used for flavouring and garnishing food.

Spice- is a seed, fruit, root, bark or other plant substance used for flavouring, colouring or preserving food.

Solar drier- is a device that uses solar energy to dry substances like food

Sun drying- is the process in which the product is heated directly by the sun rays and moisture is removed by natural circulation of air.

Chutney- is a sauce made from fruits, vegetables and herbs with vinegar, sugar and spices.

Sauces- is a liquid, cream or semi-solid food served with other dry foods.

Pickles- is a vegetable that has been soaked in brine, vinegar or other solutions left to ferment for a period of time.







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