



Ministry of Education  
and Sports

# HOME-STUDY LEARNING

PRIMARY  
6

## SCIENCE

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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.

National Curriculum Development Centre  
P.O. Box 7002,  
Kampala- Uganda  
[www.ncdc.go.ug](http://www.ncdc.go.ug)

## 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](mailto: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, welcome to this home-study material which has been prepared for you. The material covers content for term 1, II and III.

The content covered has been carefully written covering the different topics in the syllabus. This is an addition to what you had learnt before schools were closed due to outbreak of COVID-19. The content is arranged using simple steps for your understanding. The activities provided in each topic are organised in such a way that they will enable you to relate with your local environment.

The content is organised into lessons. Each lesson has activities and summary notes that help you to understand the concepts. Some lessons have projects that you need to carry out at home during this period. You are encouraged to work individually as you do the practical and interactive activities.

Feel free to try out all the activities in this material.

**Enjoy learning**



## TERM ONE

### THEME: THE HUMAN BODY

#### Topic: Circulatory System

#### Lesson 1: The Circulatory System

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

- explain the meaning of circulatory system.
- mention the components of the circulatory system.

#### Materials you will need

Chart of the human heart, the human body, pen, pencil, notebook, etc.

In Primary Five, you learnt that body organs can work together to carry out one main function. A system carries out one characteristic of living things. For example, you learnt that living things feed. The system in human beings that carries out this function is the digestive system.

In this topic, we are going to look at another system and its function in human beings. This system is the circulatory system. Now let us look at the meaning of the circulatory system.

To circulate means to move around. The circulatory system is a system of the body that helps in the transportation of materials within the body. Such materials include; digested food, waste materials, gases and medicines, among others.

It is important to know that for the circulatory system to work well, some organs and vessels are involved. These are also called parts or components of the circulatory system.

These include;

- the heart,
- blood and
- blood vessels.

#### In your notebook, write down these questions and answer them

Write the meaning of the circulatory system in your notebook.

Name the components of the circulatory system. Share your answers with your parent or guardian.

State the importance of the circulatory system in the human body.

#### Lesson2: The Human Heart

In this lesson, you should be able to state the functions of the different parts of the heart

#### Materials you will need

Chart, the human body, pen, pencil, notebook, etc.

#### Introduction

In the previous lesson, you identified the three components of the circulatory system. In this lesson you are now going to learn about one of the components.

In your notebook, write the three components of the circulatory system.

Using your right hand, touch at your left chest slightly above the position of the breasts

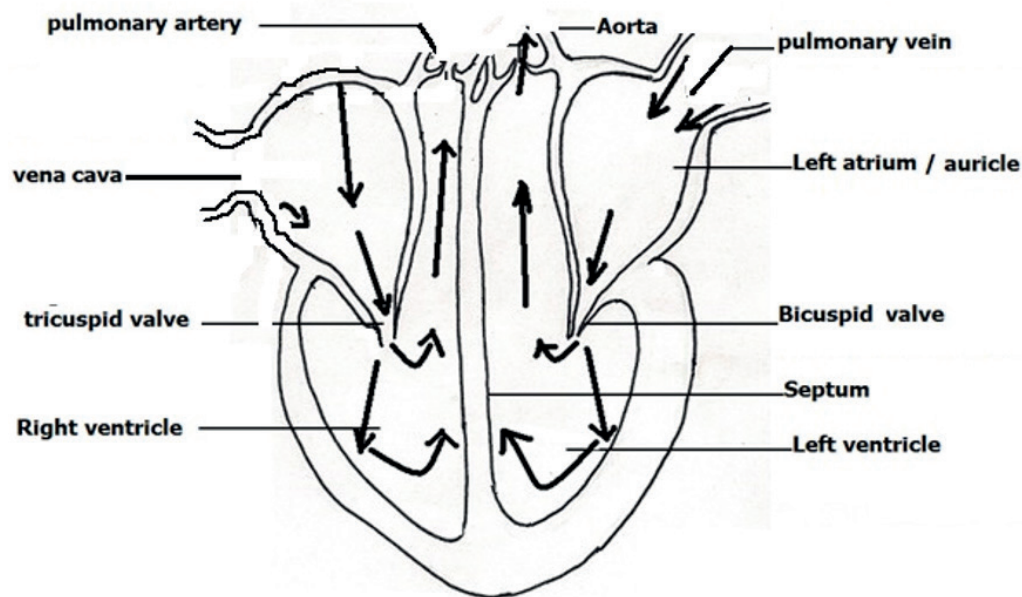
What observation have you noticed?

I am sure you felt some pressure of a beating organ. Those are the beats of the heart in your body.

Do you now recall the function of the heart in the human body that you learnt in P.4? Write your answer in your notebook.

Basing on the answer you found out, it is therefore important that we have a heart in our bodies.

### The human heart



The heart is the organ in our body that pumps blood to all parts of the body. It is found in the **chest cavity** and is protected by the ribs. The heart is divided into the left and the right sides by a muscle called the **septum**. The left side of the heart contains oxygenated blood. The right side contains deoxygenated blood. The septum stops oxygenated blood from mixing with deoxygenated blood.

### The chambers of the heart

Each side consists of the upper and lower chambers. The upper chamber is called an **auricle or atrium** while the lower chamber is called a **ventricle**.

*From this, how many chambers does the heart have?*

The auricles are separated from the ventricles by **valves**. The valves prevent blood from flowing backwards.

### The blood vessels of the heart

There are four main blood vessels that take blood into and out of the heart. These are; vena cava, pulmonary artery, pulmonary vein and aorta.

The vena cava is the main vein. It receives blood from all parts of the body and



directs it to the right auricle of the heart. This blood has less oxygen. It is called deoxygenated blood. This deoxygenated blood is pumped into the right ventricle through a valve.

The right ventricle pumps this blood to the lungs through the pulmonary artery. In the lungs, deoxygenated blood gains oxygen and loses carbon dioxide. This makes it become oxygenated blood.

From the lungs, the oxygenated blood moves into the left auricle of the heart through the pulmonary vein. This oxygenated blood in the left auricle is pumped to the left ventricle through a valve.

The left ventricle pumps the oxygenated blood through the aorta to all parts of the body. In the body, the blood loses oxygen to body cells and becomes deoxygenated blood. This deoxygenated blood flows back to the heart through the vena cava.

The left ventricle has thicker walls than the right ventricle. This is because it pumps blood to all parts of the body while the right ventricle pumps blood only to the lungs.

### Activity

Write down in your notebook the key words you have learnt in your lesson. Give their correct meanings.

Draw the parts of the human heart.

Label the parts of the human heart.

Give your work to your parent or guardian for feedback.

### Lesson 3: Parts of Blood

By the end of this lesson, you should be able to state the functions of blood in our bodies.

### Materials you will need

Chart showing structures of the different blood cells, the human body, pen, pencil, notebook, etc.

Today, in your lesson, you are going to learn about another component of the circulatory system. Have you ever had any injury on your skin? I am sure that you should have noticed a red liquid that came out of the injured part. That red liquid is called blood which is another component of the circulatory system.

### Think about it!

1. *Do you know why blood is red in colour?*
2. *Do you know why blood does not flow continuously?*
3. *Do you know why although germs are everywhere, you do not fall sick every time?*

Blood is the red liquid that flows continuously in the body. Blood in the body is a mixture of many things. These are blood cells and blood plasma.

There are three types of blood cells. These include;

red blood cells,  
white blood cells and  
platelets

Blood is able to flow because it is in liquid state. The liquid part of blood is called plasma. Let us now look at the different components of blood in details.

### **Blood cells**

**Red blood cells;** These are blood components that have circular disc shapes. They are made in the red bone marrows of short bones. They appear red because of the red pigment called haemoglobin. The main function of the red blood cells in the body is to carry oxygen around the body.

**White blood cells;** These are blood cells which have no haemoglobin. They help to fight against disease-causing germs in the body. White blood cells are commonly made in the spleen, and yellow bone marrows. The white blood cells have an irregular shape.

**Platelets;** These are small blood cells. Blood platelets are components of blood that help in blood clotting. This helps to reduce over bleeding.

### **Blood plasma**

This is the liquid part of blood. It transports digested food, waste materials, heat and hormones within the body.

### **Activity**

1. Write down any two components of blood.
2. Write their different functions in the body.
3. Explain the differences between red blood cells and white blood cells.

### **Lesson 4: Blood Vessels**

By the end of this lesson, you should be able to state the function and characteristics of each blood vessel.

### **Materials you will need**

Chart illustrating different types of blood vessels, the human body, pen, pencil, notebook, etc.

Like you learnt in your previous lessons, you noted that the heart, blood and blood vessels are parts of the circulatory system. In this lesson today, you are going to look at the blood vessels.

## Blood vessels

A vessel is a container – something used to carry something. Blood vessels are muscular tubes that help carry blood in the human body. They run from the heart to all other parts of the body and back to the heart.

There are basically three types of blood vessels and these are; arteries, veins and blood capillaries. Let us talk about them one at a time.

## Veins

- These are blood vessels that carry blood towards the heart.
- They have valves. The valves in veins open in one direction to prevent backward flow of blood.
- Veins have a wider lumen and thin walls.
- Blood in veins flows at a low pressure.
- All veins carry deoxygenated blood except the pulmonary vein.

## Arteries

Arteries are mainly blood vessels that carry blood away from the heart. They have thick walls and narrow blood passage or lumen. They lack valves. Blood in arteries flows at a high pressure.

*Note: Most arteries carry oxygenated blood except the pulmonary artery.*

For blood in the body to circulate well within the veins and the arteries, they are connected to each other and this is possible by the help of the blood capillaries.

With your two hands, can you connect the two hands together? How is that possible? I am sure you realised that the palms and your fingers made it possible and a structure is formed where the two hands met.

## Capillaries

These are the smallest blood vessels that help to connect the veins to arteries. Capillaries help to allow the exchange of blood materials.

## Activity

Fill the table below of the characteristics of the three types of blood vessels

| Characteristic              | Artery | Capillary | Vein |
|-----------------------------|--------|-----------|------|
| Direction of carrying blood |        |           |      |
| Type of blood               |        |           |      |
| Presence of valves          |        |           |      |
| Thickness of walls          |        |           |      |
| Width of the space inside   |        |           |      |
| Pressure of blood inside    |        |           |      |

**Activity 2: Measuring heart rate**

The heart rate is the number of times your heart beats in one minute.

1. Identify an artery (at the neck or at the wrists).
2. Gently press it until you feel it beating. The beating of the artery is because of the beating of the heart.
3. Set your watch.
4. Count how many times the artery beats in one minute.
5. Do this three times and get the average.

## THEME: HUMAN HEALTH

### Topic: Alcohol, Smoking and Drugs in Society

#### Lesson 1: Making Alcohol

In this lesson, you will be able to describe the different processes of making alcohol.

#### Materials you will need

Ripe mangoes, ripe bananas, ripe pineapples, clean containers, empty alcohol containers (empty sacks, empty beer bottles, empty bottles of wine etc)

#### Introduction

In your society, there are a number of activities which are done by people in order to earn a living. In this topic, you will realise that in your community, some people drink alcohol, smoke and use drugs.

Alcohol

Common alcohols in your community include; Waragi, enguli, whisky, gins, vodka, beers, kasese or lira.

#### Processes of making alcohol

There are two common processes that can be involved in the production of alcohol. These are; fermentation process and distillation process.

Fermentation process is a chemical process where a mixture of sugar and water is turned into alcohol by the help of yeast. The sugar in such plant materials like fruit juice, banana, cassava tuber, potato tubers, millet etc. is made to ferment (decompose by the action of bacteria) giving out alcohol.

The distillation process is a process used to produce pure and strong alcohol. This involves evaporation and condensation of the fermented alcohol into a distillate. Waragi, enguli, whisky, gins, vodka, beers, kasese or lira are common alcoholic drinks produced using this process.

Note: Home distillation process of producing alcohol is not recommended due to the quality of alcohol it produces and accidents that are likely to occur.

#### Task: Preparation of local alcohol

Visit somebody who makes local alcohol in your community. Observe and record the steps they take in producing alcohol.

#### Activity

In your notebook, you can try out the following

1. Name any four examples of alcoholic drinks.
2. Mention some plant materials that can be used to make local brew.
3. Discuss some of the reasons with your siblings that people give for drinking alcohol.

## Lesson 2: Uses of Alcohol to People

By the end of this lesson, you will be able to explain the different uses of alcohol to people.

### Materials you will need

Empty alcoholic drinks containers, hand sanitizers

### Introduction

Alcohol is an important drug in the society. In this lesson, you are going to look at the ways it is useful to people.

1. Alcohol (methyl alcohol) is used by doctors to sterilize medical instruments that cannot be boiled on cleaning.
2. Alcohol can be used in some thermometers since it has a low freezing point.
3. Alcohol is commonly used in industries to make sanitizers. (I hope you have ever seen some sanitizer liquids, what is their smell like?)
4. Alcohol (methylated spirit) can be used to clean the skin before an injection is taken.
5. Alcohol is also used as a disinfectant on wounds.
6. Alcohol can be used by builders to mix paints and dyes.

### Alcoholism

This is a condition that results from the prolonged use of alcohol. It results into the body's addiction to alcohol. The person who is addicted to taking alcohol for his or her normal body functioning is called an alcoholic.

There are a number of factors that may lead one to take alcohol and these may include; stress, sad news, peer pressure, family background or life style, seductive advertisement.

Have you ever seen someone who is always drinking alcohol? What factor could be the cause for him/her to drink alcohol?

On most parties and celebrations, people tend to drink some alcoholic drinks. What factor could be the cause of this?

Have you ever tasted any alcoholic drink? If yes, why and from where? What pushed you to taste it?

*Note: The habit of taking alcohol causes social and health problems in the society, to the individual and the family.*

**Activity**

Reflecting on the people in the community who drink alcohol, can you write down some disadvantages they are likely to cause to;

| Themselves | Their families | The community |
|------------|----------------|---------------|
| 1          | 1              | 1             |
| 2          | 2              | 2             |
| 3          | 3              | 3             |
| 4          | 4              | 4             |
| 5          | 5              | 5             |
| 6          | 6              | 6             |

**Summary**

From the above findings, you must have realised that alcoholism is a dangerous habit to one's health and social life. Therefore, it is now important for you never to drink alcohol and advise your siblings and friends also to avoid it.

The following are the laws governing alcohol in Uganda

Persons below 18 years of age are not allowed to drink alcohol.

All public places dealing in alcohol should be licensed after fulfilling certain standards.

Drivers are not allowed to drive under the influence of alcohol.

All forms of home distillations, transportation and possession of alcohol is illegal.

**Lesson 3: Smoking**

By the end of this lesson, you should be able to describe the different types of smoking.

**Materials you will need**

Tobacco leaves, sample pictures of cigarettes

**Introduction**

There are many practices done by people in our societies apart from drinking alcohol. Most of these practices result into habits and may be harmful to their lives in case one gets addicted. These practices are majorly from smoking of illegal drugs.

Smoking is the act of breathing in and out of burnt substances.

Can you think of the materials people commonly smoke? The commonly smoked drugs include the following: cigarettes, ganja, (marijuana or bhang), opium, cocaine. These are sniffed through the nose.

Tobacco contains nicotine which is a stimulant and an addictive substance called tar which causes lung cancer. Tobacco leaves can also be chewed or sniffed.

People have different reasons why they smoke. Some of the reasons may be social while others are as a habit.

Smoking especially tobacco is very dangerous to one's health. Tobacco contains poisonous chemicals and a gas called carbon monoxide which are harmful to one's health hence reducing on one's life expectancy. Smoking leads to a number of respiratory diseases.

Discuss with a friend or your parent the diseases that can be caused as a result of smoking?

What healthy problems have you ever noticed with people who smoke?

### Activity 1

Discuss with your parent or a friend where possible

Describe the different materials commonly smoked in your community.

Share the factors that may lead those who smoke to do it.

What could be the reasons that smokers give for smoking.

Explain the difference between active and passive smoking.

### Activity 2

Reflecting on the people in the community who smoke, write down some effects or dangers they are likely to cause to;

| Themselves | Their families | The community |
|------------|----------------|---------------|
| 1          | 1              | 1             |
| 2          | 2              | 2             |
| 3          | 3              | 3             |
| 4          | 4              | 4             |
| 5          | 5              | 5             |
| 6          | 6              | 6             |

### Summary

From your findings above, you must have realised that there isn't any health benefit in smoking. For that reason, the Ministry of Health in Uganda announced that smoking was an illegal act and forbidden at all costs.

It is also very important to note that smoking is dangerous to pregnant mothers in many ways. It may result into; miscarriage, premature birth or stillbirth, and causes underweight births.

Diseases that result from smoking include; lung cancer and emphysema.

Tuberculosis, bronchitis and pneumonia are worsened by smoking.



## Lesson 4: Essential Drugs

By the end of this lesson, you should be able to describe the different essential drugs commonly used in our communities.

### Materials you will need

Sample of common drugs like pain killers, cough mixture syrups, ointments in the home first Aid box.

### Introduction

In our families and communities, we commonly use drugs to get well whenever we are not healthy or sick. Some of these materials are obtained naturally from the environment while others are bought from the nearby clinics or got from hospitals. Such materials are called essential drugs.

### Essential Drugs

A drug is any chemical substance introduced in the body that affects the way the body works. Drugs are either useful or harmful. Medicinal drugs are used to treat or cure diseases. Vaccines are used to prevent diseases. Harmful drugs can cause dangerous effects on the body. Alcohol, mairungi/khat, cigarettes, marijuana, etc. are harmful drugs.

There are some useful drugs that are commonly used in communities. These drugs treat the common diseases in that population. They are called essential drugs. In Uganda, drugs like Panadol, coartem, diclofenac, amoxicillin, etc. are essential drugs.

Features of essential drugs include;

- They treat common sicknesses
- They are cheap
- They are effective
- They are readily available within the society

### Task 1

With the help of your parent or guardian, identify the common plants (in your local language) that can be used as medicine and the diseases they cure.

| No. | Plant material | Disease it cures |
|-----|----------------|------------------|
| 1.  |                |                  |
| 2.  |                |                  |
| 3.  |                |                  |
| 4.  |                |                  |
| 5.  |                |                  |
| 6.  |                |                  |
| 7.  |                |                  |
| 8.  |                |                  |
| 9.  |                |                  |
| 10. |                |                  |

**Task 2**

With the help of your parent or guardian, make a visit to a nearby clinic or health centre if possible.

Find out from the nurse or the health worker the medicinal drugs they have and what sicknesses they cure.

Write your findings in your notebook.

| No. | Drug | Disease it cures |
|-----|------|------------------|
| 1.  |      |                  |
| 2.  |      |                  |
| 3.  |      |                  |
| 4.  |      |                  |
| 5.  |      |                  |
| 6.  |      |                  |
| 7.  |      |                  |
| 8.  |      |                  |
| 9.  |      |                  |
| 10. |      |                  |

**Lesson 5: Usage of Drugs**

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

describe the different usage of drugs.

participate in campaigns against alcohol, smoking and drugs.

**Materials you will need**

Sample packets of medicines, syrups, packets of medical drugs

**Introduction**

Drugs help to boost our immune system so as to defend and fight the disease germs in our bodies. For effectiveness of these drugs in our bodies, there are precautions that are always followed. These precautions help us to avoid drug misuse and abuse.

Drug misuse is the act of using a drug without or against the recommended advice. It simply means the wrong use of a drug. Therefore, to avoid drug misuse, we need to follow the drug prescriptions.

Drug prescription is the written information given by a health worker on how to use a certain drug. Prescription of drugs is based on the age, weight of the patient, sex or gender and duration or length of illness.

Prescribed drugs consist of; name of the drug the disease it cures, time of taking the drug, and the dosage. Proper prescription of medicinal drugs helps to control and prevent health dangers that may result from over dosage or under dosage.

Under dosage is when one takes less drugs than the recommended. Over dosage means when one takes more drugs than the recommended dose.  
 Note: Essential drugs should only be bought from recommendable Health Centre and not from shops and markets.

### Activity

With the help of your friend, parent or guardian, briefly explain the meaning of the medical language as used in drug prescription.

| No. | Name of the drug    | Prescription                   | Meaning |
|-----|---------------------|--------------------------------|---------|
| 1.  | Tablets             | 2x 3<br>$\frac{1}{2} \times 3$ |         |
| 2.  | Syrup medicine      | 1x 3                           |         |
| 3.  | Injectable medicine | 1x 2                           |         |

### Drug storage

Drugs need to be kept in a clean cool dry place to prevent them from contamination. This is because drugs given most times are not used at once. Therefore, to prevent them from contamination and losing their curative value before they are taken, there is need to keep them safe.

Poorly stored drugs instead become poisonous to one's health and therefore such drugs should not be taken. Drugs should also be kept away from children to prevent child poisoning at home.

### Drug abuse

This is the use of a drug in a way that is harmful to one's health. Drugs abused can be either legal or illegal. Such drugs can cause health damages to the body organs such as the brain, liver, pancreas, etc. They can also cause abnormalities, improper body function or even death.

### Task 1

Write a simple poem about common drugs used by people in your community. In your poem, highlight the name of the drug, its dangers to one's health and the preventive measures. (For example, alcohol, tobacco, marijuana, etc.)

### Task 2

In your notebook, write down some ten preventive measures you can give to your friends in order to avoid the temptation of getting victims of drugs of dependence.

Share your findings with your parent or guardian and your science teacher when schools reopen.

## TERM TWO

### THEME: THE WORLD OF LIVING THINGS

#### Topic: Classification of Plants

#### Lesson 1: Characteristics of Plants

By the end of this lesson, you should be able to classify algae and spore bearing plants.

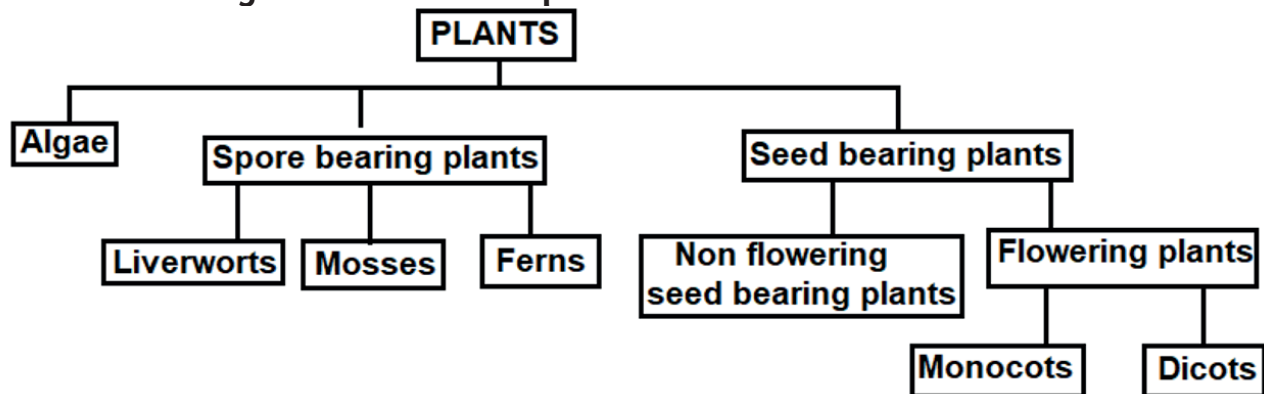
#### Materials you will need

Notebook, pens, pencils, plants, rubber

#### Introduction

In this lesson, you are going to learn about classifying algae and spore-bearing plants. Plants are green growing living things on the earth's surface. They are the major components of living things in the environment. Plants are referred to as the primary sources of food to animals in the environment because they are capable of making their own food.

#### A table showing classification of plants



Plants can be grouped into three main groups as;

- Algae
- Spore-bearing plants
- Seed-bearing plants

#### The algae

- These are very simple.
- They live in water or moist areas.
- They reproduce by fragmentation and conjugation, though some produce spores.

#### Spore-bearing plants

These are non-flowering plants that reproduce by means of spores. A spore is a reproductive cell. The cell can move from the mother plant and grow into a new plant.

Examples of spore-bearing plants are; mosses, liverworts, horsetails and ferns

| No | Name of plant | Description  |
|----|---------------|--|
| 1  | Liverworts    | <ul style="list-style-type: none"> <li>• Liverworts have flat leaves</li> <li>• Grow in wet places</li> </ul>  |
| 2  | Mosses        | <ul style="list-style-type: none"> <li>• Mosses are small plants that grow in places which have moisture like damp rock, tree trunks, roof and damp walls</li> <li>• Mosses have stems and leaves</li> <li>• Mosses do not have roots</li> </ul> |
| 3  | Ferns         | <ul style="list-style-type: none"> <li>• Ferns have roots, stems and leaves</li> <li>• They grow in moist shady places</li> </ul>  |

### Seed-bearing plants

These plants reproduce by means of seeds. They are divided into two groups as flowering plants and non-flowering plants.

Non-flowering plants produce naked seeds. They have no fruits. These include; pine, cedar and Christmas tree, among others. They have tap roots, huge stems and needle like green leaves. Conifers do not produce flowers, instead they have cones where seeds are formed

Flowering plants produce seeds inside fruits. The fruits develop from the ovary of the flowers.

#### Activity

Take a walk around the compound and observe some of the trees in the compound.

How are those trees able to reproduce?

Do they bear flowers?

Which trees bear fruits?

How are such trees useful in the compound?

## Lesson 2: Flowering Plants

By the end of this lesson, you should be able to classify flowering plants.

### Materials you will need

Book, pens, maize plant, bean plant, guava

### Introduction

Plants in the environment can be classified according to their characteristics such as bearing flowers and fruits. In P4, you learnt that plants that bear flowers are called flowering plants. Flowers produce seeds which are covered and protected in their fruits. A flowering plant is made of two systems namely; shoot system and root system. Flowering plants are further divided into two as;

- **Monocotyledonous plants (monocots).** These have seeds with one cotyledon. They include; maize, rice, millet, sugarcane, grasses, onions.
- **Dicotyledonous plants (dicots).** These have seeds with two cotyledons. They include; mango, avocado, dodo, cabbages, beans, cassia, fig tree, etc.

**Guided discovery**

Take a nature walk around a nearby garden.

Uproot some plants to observe their root system.

Take a keen observation also on their leaves and type of germination.

Fill in the following table basing on your findings

| Name of the plant | Type of root system | Type of venation | Type of germination |
|-------------------|---------------------|------------------|---------------------|
|                   |                     |                  |                     |
|                   |                     |                  |                     |
|                   |                     |                  |                     |
|                   |                     |                  |                     |
|                   |                     |                  |                     |
|                   |                     |                  |                     |
|                   |                     |                  |                     |
|                   |                     |                  |                     |

**Lesson 3:Seed Dispersal**

By the end of this lesson, you should be able to explain the importance of seed dispersal.

**Materials you will need**

Book, pens, pencils, rubber, seeds, guava

**Introduction**

In this lesson, you are going to learn about seed dispersal. A seed is a very important part of a plant and it develops from fertilized ovules of a flower.

In most plants, the seeds and fruits are scattered from the mother (parent) plant. The scattering of seeds and fruits from parent plants to other places is called seed dispersal. In some plants, the seeds are contained in a fleshy, juicy fruit that are eaten and thrown away. The seeds can be dispersed by wind, animals, water and self-explosion. Wind, animals and water are agents of seed dispersal while self-explosion is a mechanism of seed dispersal.

There are four types of seed dispersal and these include;

Wind dispersal

Animal dispersal

Water dispersal

Self-dispersal (explosive mechanism)

The table below shows the agents of seed dispersal, characteristics of seeds and examples

| Agent   | Characteristics of seeds | Examples                     |
|---------|--------------------------|------------------------------|
| Wind    |                          |                              |
| Animals |                          |                              |
| Water   |                          | Coconuts<br>Water lily seeds |

### Importance of seed dispersal

It enables plants to colonise new areas.

It reduces competition for food nutrients, sunlight and space among plants.

It prevents overcrowding of plants.

It increases the chances of survival of plant species (it prevents plants from disappearing from the earth).

It minimises diseases among crowded seedlings.

### Lesson: 4 Plant Propagation

By the end of this lesson, you should be able to describe the different ways different plants reproduce.

#### Materials you will need

Some seeds, plant cuttings, suckers, bulbs, ginger

#### Introduction

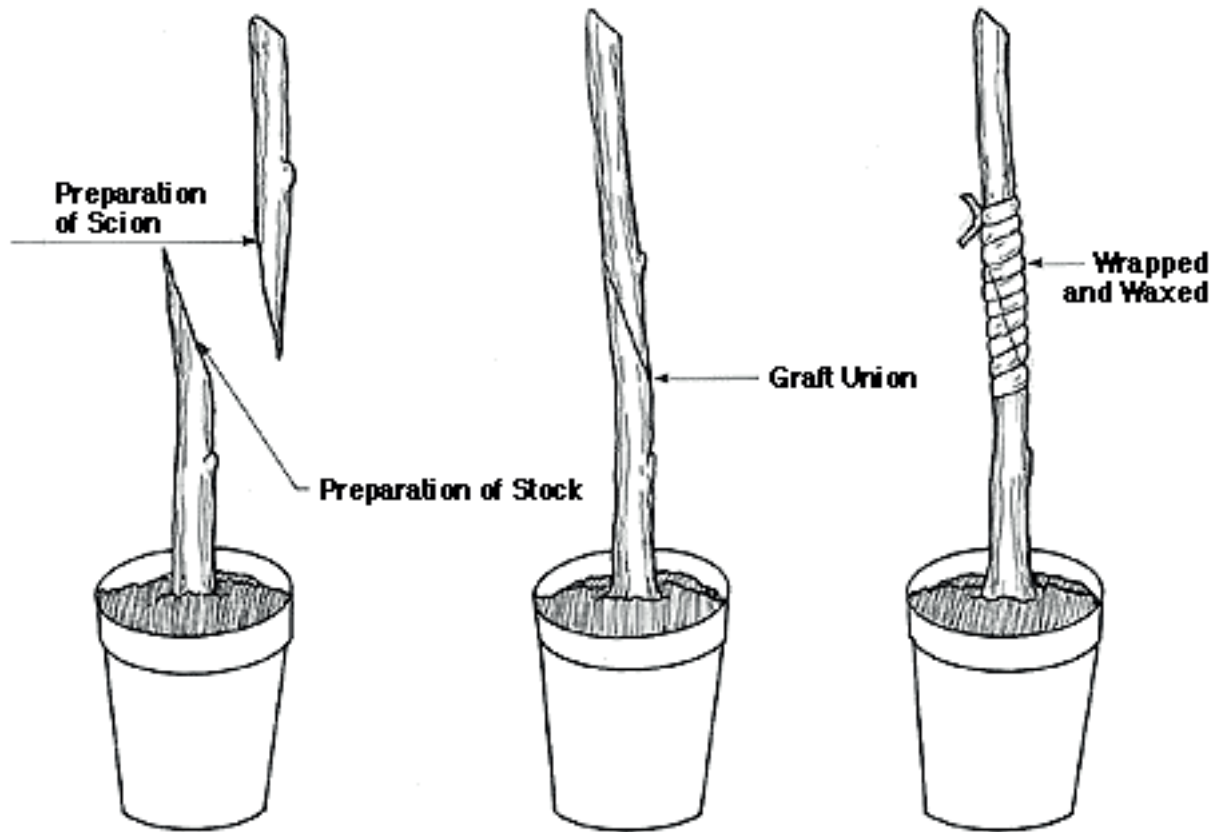
Different plants in the environment have different ways they reproduce or they can be planted. In this lesson, you are going to look at the ways plants are able to develop new plants from the parent plant. This is called plant propagation. Plant propagation is the development of new plants from a part of the older plant. Different parts of the parent plant can be used for example; stems, leaves and seeds.

There are mainly two types of propagation namely; seed propagation and vegetative propagation. Seed propagation involves the use of seeds while vegetative propagation involves use of other plant parts. These may include stems or leaves.

Plants that can be propagated by use of stems include; cassava, sweet potatoes, sugarcane among others. Some other plants can be planted using bulbs, tubers, corms, rhizomes, suckers and leaves.

Vegetative propagation can also be done artificially through grafting, budding, layering and marcotting.

In grafting, a twig called the scion is taken from the type of plant to be propagated and firmly placed on the stem.



#### Project work

Make a simple garden within the compound

1. Plant different plants using seeds, stem cuttings and bulbs, among others.
2. Observe them as they grow into seedlings.
3. Care for them till they mature.
4. Seek guidance from your parent on other methods of plant propagation such as grafting.



## THEME: SCIENCE IN HUMAN ACTIVITIES AND OCCUPATION

### Topic: Keeping Cattle

#### Lesson 1: Types and breeds of cattle

By the end of this lesson, you should be able to explain the different types and breeds of cattle.

#### Materials you will need

Cattle in the immediate environment

#### Introduction

In lower classes, you learnt of farm projects carried out in our societies. Such projects included; rearing of rabbits, poultry, goats, sheep, pigs and bees. In this topic, you are going to learn more about yet another group of farm animals which are commonly reared by people in our communities.

#### Cattle

Cattle means the livestock that includes cows, bulls, heifers, calves and oxen. People keep cattle for different reasons or purposes.

Can you think of the reasons why cattle are reared?

In your notebook, write down any six products that can be obtained from cattle

Farmers keep cattle depending on their characteristics. Such desired characteristics make up a breed of cattle.

#### Breeds of cattle

Different groups of cattle have similar characteristics such as shape, size, skin colour and productivity which they inherit from their parents. In Uganda, farmers majorly keep three breeds of cattle. These include; local breeds, exotic breeds and crossbreeds. These breeds have different characteristics which are desired by the farmers.

Cattle have different types basing on the reason why a farmer should keep it. Some cattle are kept for meat or milk while others are kept for both milk and meat. Therefore, a type of cattle is a class of cattle kept for a purpose. There are mainly four different types of cattle kept by farmers namely; dairy cattle for milk production, beef cattle for meat production, dual purpose cattle for both milk and meat and draught cattle for provision of animal labour.

**Task**

With guidance from your parent or even the farm manager, find out the characteristics and examples of the following;

| No. | Breed                     | Characteristics | Examples       |
|-----|---------------------------|-----------------|----------------|
| 1.  | Local breeds (indigenous) | 1.<br>2.<br>3.  | 1.<br>2.<br>3. |
| 2.  | Exotic breeds             | 1.<br>2.<br>3.  | 1.<br>2.<br>3. |
| 3.  | Crossbreeds               | 1.<br>2.<br>3.  | 1.<br>2.<br>3. |

**Lesson 2: Methods of Grazing Cattle**

By the end of this lesson, you should be able to describe the different ways of grazing and watering cattle.

**Materials you will need**

Cattle in the immediate environment and sample structures that can be used to feed cattle.

**Introduction**

Cattle should be fed well in order to grow well and look healthy. Cattle are able to produce more when they are fed well. For example, a dairy cow produces more milk and beef cattle can produce good quality beef only when they are fed well and healthy.

**Feeding of Cattle**

Grazing cattle is the act of providing nutritious feeds to cattle. All cattle should be fed well on clean pasture and fodder. Pasture is an open grassland where cattle can graze. Some pastures can be grown purposely to feed cattle and these are called fodder crops. Cattle should also be provided with clean water to drink in order to keep them healthy.

There are various ways or systems that can be used in feeding of cattle. Some of these include zero grazing and rotational grazing. These systems have methods which are involved such as; paddocking, tethering, free-range and strip grazing.

**Zero grazing method of keeping cattle**

Some cattle farmers prefer having their cattle housed where feeds and water are provided.

Have you ever seen such a method of grazing cattle in your community?

**Tethering method of grazing cattle**

In this method of grazing cattle, the animal is tied with a rope onto a peg on a tree in order to graze in a restricted area. After some period of time, the animal is shifted to another new area with fresh pasture.

**Paddocking method of grazing cattle**

In this method of grazing cattle, land is divided into small plots called paddocks where cattle are made to graze at a time. This method allows pasture to grow and is properly used. Therefore, wastage of pasture is avoided because animals use all the pasture in one paddock before they are moved to another paddock.

**Free-range / herding method of grazing cattle**

This is where animals are left to graze in the field in the guidance of a herdsman. It is most common in rural areas. In this method, uniform



distribution of manure is achieved and many animals can be looked after by one person. However, there are a number of disadvantages involved as well.



**Task 1: Making of a feeding trough for cattle**  
Materials needed shall include;

*Some wood, some old plastics like jerry cans, some nails, hammer*

**Procedure**

1. *Make some reasonable measurements of the wood.*
2. *Cut some pieces of the plastic.*
3. *Using a hammer and nails, fix the pieces of wood to form a simple box with no top.*
4. *Fix the small spaces between the wood with pieces of plastics.*
5. *Put some stands to keep it slightly above the ground.*

**Activity 2**

In your notebook, copy and complete correctly the table below about the methods of grazing cattle

| No. | Method       | Advantages     | Disadvantages  |
|-----|--------------|----------------|----------------|
| 1.  | Zero grazing | 1.<br>2.<br>3. | 1.<br>2.<br>3. |
| 2.  | Paddock      | 1.<br>2.<br>3. | 1.<br>2.<br>3. |

|    |           |                |                |
|----|-----------|----------------|----------------|
| 3. | Tethering | 1.<br>2.<br>3. | 1.<br>2.<br>3. |
|----|-----------|----------------|----------------|

**Task 3**

In your notebook, write down the importance of the following ways of caring for cattle.

| No. | Way of caring                | importance     |
|-----|------------------------------|----------------|
| 1.  | Provision of clean water     | 1.<br>2.<br>3. |
| 2.  | Provision of clean feeds     | 1.<br>2.<br>3. |
| 3.  | Provision of a clean shelter | 1.<br>2.<br>3. |
| 4.  | Protection against parasites | 1.<br>2.<br>3. |
| 5.  | Early treatment              | 1.<br>2.<br>3. |
| 6.  | Protection against predators | 1.<br>2.<br>3. |

**Lesson 3: Cattle Diseases**

By the end of this lesson, you should be able to describe the causes, spread, signs, symptoms, prevention, control and treatment of cattle diseases.

**Materials you will need**

Cattle from the immediate environment

**Introduction**

Healthy cattle produce more products such as milk and beef (meat). For cattle to be healthy, the animals should be carefully looked after in order to produce high quantity and quality products.

For cattle to be healthy, the animals should be fed on clean and nutritious feeds, given clean water to drink, protected against predators, parasites and harsh weather conditions. Cattle should also be protected against disease germs and treated in time when they fall sick.

Parasites are organisms that depend on others for food. Cattle parasites

commonly result from the responsibility of the farmer towards his/her cattle. It is very important for the farmer to be responsible in addressing all the needs of his/her cattle.

Cattle parasites are in two categories namely; ectoparasites or external parasites. These are the parasites that attack outside the body of the animal e.g. ticks, mites and tsetse flies. These can be controlled through; dipping the animals in dip tanks containing acaricides, spraying using acaricides, hand picking and dusting of the skin.

Endoparasites or internal parasites are the ones that attack and live inside the body of an animal e.g. tapeworms, liver flukes, roundworms, etc. These commonly result from feeding cattle on dirty pasture or in dirty containers. Diseases of cattle are caused by bacteria, viruses and protozoa. There are a number of factors that may result into cattle contracting diseases such as; poor feeding, dirty housing, irregular vaccination and congestion in the kraal.

### Guided discovery

Using research and personal experience, fill in the table below about common diseases that affect cattle in your community.

| Disease | How it spreads | Signs and symptoms | Prevention and control |
|---------|----------------|--------------------|------------------------|
| 1.      |                |                    |                        |
| 2.      |                |                    |                        |
| 3.      |                |                    |                        |
| 4.      |                |                    |                        |
| 5.      |                |                    |                        |
| 6.      |                |                    |                        |

## THEME: THE ENVIRONMENT

### Topic: Resources in the Environment

#### Lesson: 1: Living Things and Non-Living Things as Resources in the Environment

By the end of this lesson, you should be able to group examples of resources under living and non-living things.

#### Materials you will need

Soil from the immediate environment

#### Introduction

We obtain a number of things from the environment to support our lives. These materials are called resources. In this topic, you are going to learn more about these resources.

A resource is any material in the environment which is used to satisfy man's needs. Resources are obtained from both living and non-living things components of the environment.

Living components of the environment are majorly two namely; plants and animals. The non-living components of the environment include sunshine, wind, soil and water.

Soil is the top layer of the earth's surface. Soil is used by people for survival or to obtain other materials to support their lives. For example; plants are grown on soil, sand is used for building houses and making bricks, sandy soil is used to make glasses, clay soil is used to model different items.

Wind is moving air or air with force. Wind can be used by people to do a number of activities.

People use plants in many different ways to support their lives such as providing food, source of raw materials for industrial manufacturing, etc.

Animals are also living components of the environment and are used by people for different purposes.

#### Task

In your notebook, complete the table below by giving four different ways the following resources are useful to people

| No. | Type of resource | Use |
|-----|------------------|-----|
|     | Plants           |     |
|     | Animals          |     |
|     | Wind             |     |
|     | Sunshine         |     |
|     | Soil             |     |
|     | Water            |     |

## Lesson 2: Renewable and Non-renewable resources

By the end of this lesson, you should be able to describe renewable and non-renewable resources.

### Materials you will need

Note book, pen, and pencil

### Introduction

The resources we learnt about in our previous lesson are classified into two namely; renewable and non-renewable resources.

#### Renewable resources

Renewable resources are resources which can be naturally replaced when used up. These resources do not get finished up or get over from the environment. Examples of renewable resources include plants, animals, water, soil, air/wind and the sun.

Plants are classified under renewable resources because they are able to multiply themselves naturally. This is the main reason we are able to see the grass, trees or bushes grow in the environment. Animals also keep reproducing in order to keep existing, although others die.

There are two processes of soil formation namely; weathering and decomposition of organic matter. These are the ways soil gets replaced in the environment.

Through a water cycle, water is able to be replaced in the environment.

Wind/air and sunshine are always available and enough to all people in the environment.

#### Non-renewable resources

These are resources which cannot be replaced naturally when used up. These materials can easily get finished or used up once not used sparingly. Such examples include; natural gas, petroleum e.g. petrol and diesel; minerals e.g. copper, gold, Aluminium, etc.

### Activity

State the difference between renewable and non-renewable resources.

Describe how each of the following are replaced in the environment.

Water

Plants

Soil

Wind



### Lesson 3: Conservation of Resources

By the end of this lesson, you should be able to participate actively in the protection and conservation of resources in the environment.

#### Materials you will need

Note book, pen, and pencil

#### Introduction

Resources in the environment should be protected, conserved or used sparingly so as to prevent them from getting over or finished. This can be called sustainability of resources. To sustain means to keep something alive or available for use when needed.

#### Conservation of resources

Conservation means preventing loss, wastage, over-use, damage or destruction. Renewable and non-renewable resources should carefully be protected or conserved to ensure their continuous existence in the environment.

Cutting down trees without replacement affects the environment and other organisms in the components as well. There is need to protect trees and forests in the environment.

Soil in the environment should be cared for in order to maintain and improve on its fertility. This makes it productive for crop growing hence a source of food to both animals and people.

Water should be harvested well and kept in clean containers for future use.

Animals also should be cared for through proper feeding, treated when sick, and protected from bad weather and predators.

Recycling metal scraps, garbage and plastic materials instead of using new ones helps in conservation of the minerals. This can be achieved through practicing the 5Rs of waste management (Reuse, Recycle, Reduce, Recover, Refuse).

#### Task 1

From what you have learnt about resources in the environment, write down the energy resources available in your environment. State any one importance of each of them.

## THEME: HUMAN BODY

### Topic: Respiratory System

#### Lesson 1: Structure and Functions of Parts of the Respiratory System

By the end of this lesson, you should be able to describe the structure and functions of parts of the respiratory system.

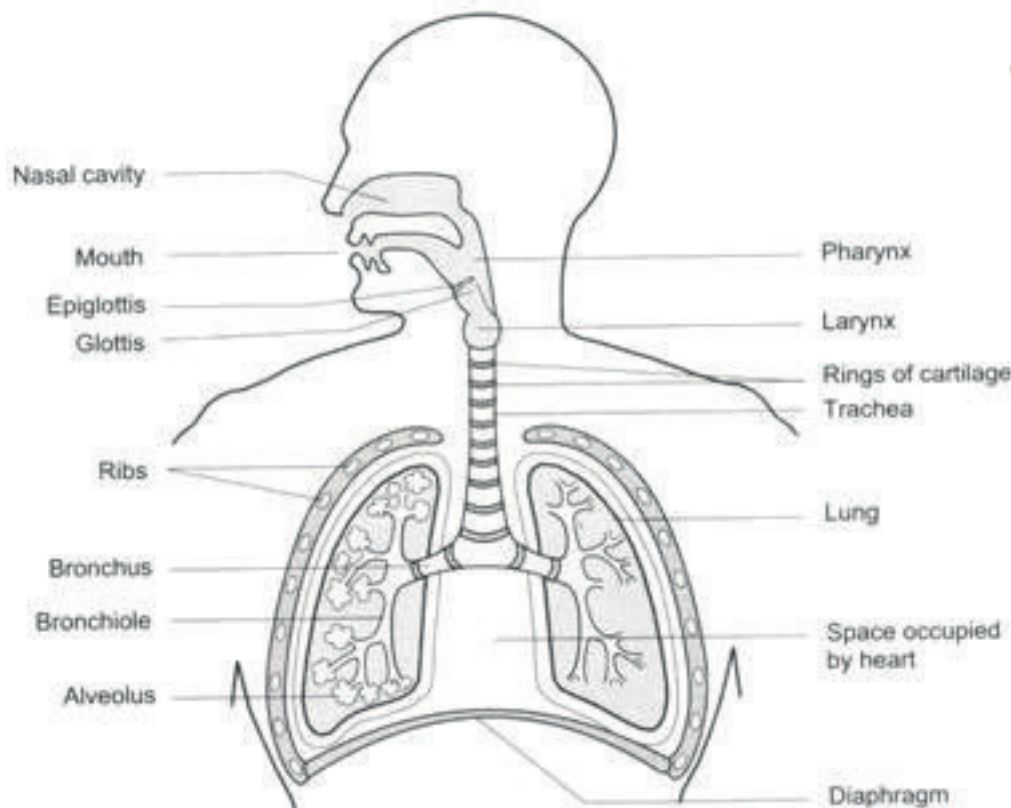
#### Materials you will need

Notebook, pen, pencil, Clay, soft boxes, charcoal dust, water, painting brush, dry sticks

#### Introduction

The human body is made up of different systems working together to perform an activity. As a living thing, you breathe in a mixture of gases through your nose. Oxygen as part of the air you breathe in is used to burn down food in the body cells to produce energy, carbon dioxide and water vapour. This process is called respiration.

Respiration is the process by which the body uses food and oxygen to produce energy, carbon dioxide and water vapour. Respiration can as well be defined as the breakdown of food in the body cells to produce energy. Respiration is very important to the body because it enables the body to get energy. The body uses energy to do different activities. Carbon dioxide and water vapour are given out as by-products of respiration.



Human respiratory system

## Parts and function of each of the part of the respiratory system

| Name of the part        | Function of the part  |
|-------------------------|---|
| <b>Nose</b>             | <ul style="list-style-type: none"> <li>• The nose is the inlet and outlet of air to the trachea.</li> <li>• It has tiny hair called cilia that trap dust, dirt and germs.</li> <li>• It has mucus which moistens the air we breathe in.</li> <li>• The air that passes through the nose is warmed, filtered and moistened and that is why it is advisable to breathe through the nose not the mouth.</li> </ul> |
| <b>Trachea</b>          | <ul style="list-style-type: none"> <li>• The trachea allows continuous flow of air in and out of the lungs.</li> <li>• It is made up of rings of cartilage to keep it open all the time.</li> </ul>   |
| <b>Epiglottis</b>       | <ul style="list-style-type: none"> <li>• The epiglottis prevents food from entering the trachea during swallowing.</li> </ul>   |
| <b>Larynx</b>           | <ul style="list-style-type: none"> <li>• The larynx contains vocal cords which vibrate when air passes over them and produce sound.</li> </ul>  |
| <b>Lungs</b>            | <ul style="list-style-type: none"> <li>• Gaseous exchange in the body takes place in the lungs.</li> <li>• The lungs are used for breathing.</li> <li>• They also remove carbon dioxide and water vapour from the body.</li> </ul>  |
| <b>Air sacs/alveoli</b> | <ul style="list-style-type: none"> <li>• This is where gaseous exchange takes place in the lungs.</li> <li>• The releasing of carbon dioxide from blood and gaining of oxygen is called gaseous exchange.</li> </ul>  |
| <b>Diaphragm</b>        | <ul style="list-style-type: none"> <li>• The diaphragm separates the chest cavity from the abdominal cavity.</li> </ul>   |
| <b>Rib cage</b>         | <ul style="list-style-type: none"> <li>• The rib cage protects the lungs and the heart from damage.</li> </ul>  |

**Project work: Modeling a structure of the respiratory system****Steps to be taken**

1. Obtain clay from the environment and remove the hard particles and rubbish.
2. Mix it with some water to make it soft for easy modeling.
3. Make tracing of the respiratory system on the hard box.
4. Using clay, model the respiratory system following the traces on the box.
5. Use charcoal paste to colour some parts.
6. Expose the model to little heat for drying to harden.

## Lesson 2: Breathing

By the end of this lesson, you should be able to describe the process of breathing. In this lesson, you will learn about the process of breathing.

### Materials you will need

Notebook, pen, pencil

### Introduction

Breathing is the act of taking in and out of air. It is the act of taking in air into the lungs and taking out air from the lungs. There are two types of breathing namely; inspiration/breathing in and expiration/breathing out.

Inspiration is the act of drawing in air into the lungs. The air we breathe in contains more oxygen than carbon dioxide. Oxygen is the gas in air that we use during respiration to breakdown food.

Expiration is the act of taking out air from the lungs. Expiration is also called breathing out. It helps to remove carbon dioxide and water vapour from the body. When deoxygenated blood from the heart reaches the lungs, carbon dioxide moves out of it and oxygen is added to it. This takes place across the walls of the air sacs or alveoli.

How are the air sacs adapted to their function of gaseous exchange?

Air sacs have thin walls. This makes it easy for gases to move across them.

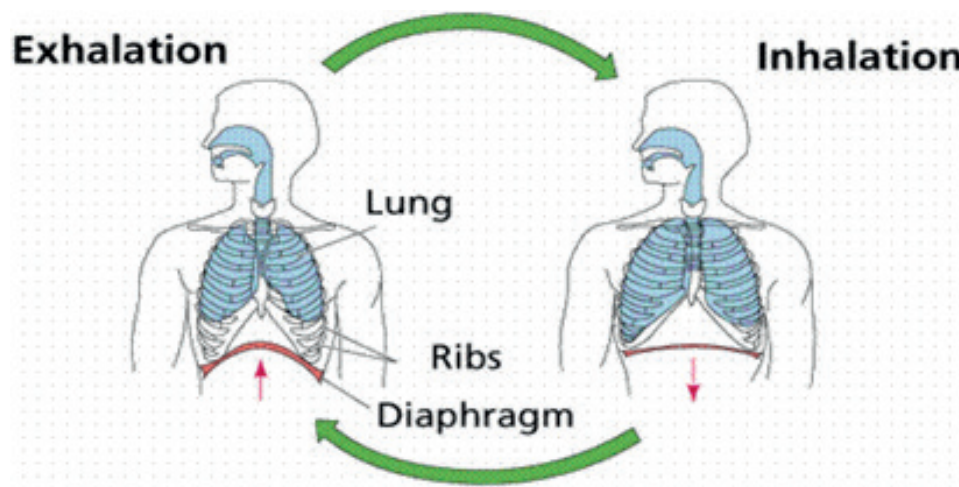
They are surrounded by a network of blood capillaries.

They are very many in number to increase surface area for gaseous exchange.

### A summarised table showing the breathing events

| No. | Respiratory parts   | Breathing in/inspiration   | Breathing out/expiration                  |
|-----|---------------------|--|---|
| 1   | Diaphragm           | Contracts and flattens to create more space for the lungs as they expand | The diaphragm relaxes                     |
| 2   | Lungs               | Expand to allow incoming air   | Reduce in size                            |
| 3   | Ribs                | Move upwards and outwards to create more space for the lungs             | Move downwards and inwards                |
| 4   | The chest           | Increases in volume  | Reduces in volume                         |
| 5   | Intercostal muscles | Contract to raise the ribs upwards and outwards                          | Relax to allow the ribs to move downwards |

Diagram showing the Position of the diaphragm during inhalation and exhalation



### Lesson 3: Diseases and Disorders of the Respiratory System

By the end of this lesson, you should be able to identify diseases and disorders of the respiratory system.

#### Materials you will need

Notebook, pen, pencil

#### Introduction

The respiratory system, like any other system of the body, can fail to work well if it is not properly cared for or if it is attacked by some diseases and disorders. In this lesson, you are going to learn about disorders and diseases of the respiratory system, their causes, signs and symptoms and their prevention.

**The disorders of the respiratory system include;**

- Nasal congestion
- Accumulation of mucus in the air sacs
- Cough
- Chocking
- Hiccups
- Fixing foreign bodies in the nose

Diseases of the respiratory system are as summarized in the table below;

| Disease        | Cause    | Signs and symptoms  | Prevention   |
|----------------|----------|---|--|
| Tuberculosis   | Bacteria | <ul style="list-style-type: none"> <li>Chronic cough with sputum production</li> <li>Sneezing</li> <li>Difficulty in breathing</li> <li>General body weakness</li> <li>Loss of weight</li> <li>Excessive sweating at night</li> </ul> | <ul style="list-style-type: none"> <li>Treating the patient</li> <li>Isolation of infected persons</li> <li>Covering mouth when coughing</li> <li>Immunization by BCG vaccine</li> </ul> |
| Pneumonia      | Bacteria | <ul style="list-style-type: none"> <li>Difficulty in breathing</li> <li>Sharp pain in the chest</li> <li>High fever</li> <li>Cough with blood</li> <li>Rapid and shallow breathing</li> </ul>   | <ul style="list-style-type: none"> <li>Immunization of children with PCV(pneumococcal vaccine)</li> <li>Staying in well ventilated places</li> <li>Treating with antibiotics</li> </ul>  |
| Whooping cough | Bacteria | <ul style="list-style-type: none"> <li>Coughing that ends in vomiting</li> <li>Gasp for breath</li> <li>Running nose</li> </ul>   | Immunization of children by DPT vaccine  |
| Influenza      | Virus    | <ul style="list-style-type: none"> <li>Fever</li> <li>Nasal congestion</li> <li>Muscle pain</li> <li>Headache</li> </ul>  | <ul style="list-style-type: none"> <li>Stay in well ventilated places</li> <li>Avoid staying in crowded places</li> <li>Seek medical help</li> </ul>                                     |
| Bronchitis     | Bacteria | Fever<br>Productive cough   | <ul style="list-style-type: none"> <li>Avoid smoking</li> <li>Avoid dusty places</li> </ul>  |
| Lung cancer    | Tobacco  | smoking<br>Abnormal growth of cells in the lungs  | Avoid smoking  |

|        |                        |                         |                           |
|--------|------------------------|-------------------------|---------------------------|
| Asthma | Inherited from parents | Difficulty in breathing | Avoid dust, spray, pollen |
|--------|------------------------|-------------------------|---------------------------|

#### Lesson 4: Keeping the Respiratory System in Healthy Working Condition

By the end of this lesson, you should be able to participate in campaigns to keep the respiratory system in a healthy working condition.

#### Materials you will need

Notebook, pen, pencil

#### Introduction

Respiration helps the body to get energy to do different activities like walking, running and playing and this is only possible if the respiratory system is in healthy working condition. Some of the habits that may harm the respiratory organs include smoking, drug abuse, and self-medication, among others.

There are many things you can do to keep your respiratory organs in good health so that they can function properly. Some of them include;

- Feeding on a balanced diet.
- Having regular physical body exercises.
- Avoiding tobacco smoking.
- Having sufficient sleep and rest.
- Avoiding playing or working in dirty and dusty places without wearing face masks.
- Immunization of babies with for example BCG vaccine and DPT vaccine.
- Avoid staying in dusty environments.
- Breathing in through the nose and not through the mouth.

#### Activity

1. In your notebook, state some of the different ways of taking good care of your respiratory system.
2. Take a study in your home or even in your community:  
Are there some members suffering from any respiratory disease?  
What could be the likely causes to their infections?  
What advice can you give in order to safeguard themselves from getting such diseases?



**TERM THREE****THEME: SCIENCE IN HUMAN ACTIVITIES AND OCCUPATIONS****Topic: Science at Home and in Our Community****Lesson 1: Preparing Clean and Safe Water**

By the end of this lesson, you should be able to describe ways of preparing clean and safe water for drinking and washing.

**Materials you will need**

Notebook, pen, pencil, resources in the environment; water, clean piece of cloth, jug

**Introduction**

In lower classes, you learnt about sources of water. In this topic, you are to learn about the activities we can do to obtain clean and safe water for drinking and washing.

Water is very important to us. We use it for a number of activities at home. Water should be clean and safe. We should prevent it from getting contaminated with germs that cause diseases. Such diseases may include; cholera, diarrhoea, typhoid and dysentery.

Clean and safe water can be obtained through; boiling, filtration, decanting and through treating with chemicals.

Filtration is the act of separating solid particles from water such as; soil, rubbish, small insects, worms, etc. Different materials can be used during this process.

Decanting involves leaving the dirty water to settle and pouring off the clean water into another clean container. This water should also be filtered.

Water obtained by filtration and decanting can be used purposely for washing and other activities besides drinking. To obtain clean and safe water for drinking, it should either be boiled or treated with chemicals. This helps to kill the germs that may cause diseases.

***Task: How to obtain clean water by filtration******Materials needed***

***Clean plant leaves or a cloth, big container, string and dirty water.***

***Steps to follow***

- i) Tie the piece of clean cloth with a string around the container.***
- ii) Pour the dirty water into the container through the clean cloth.***
- iii) Observe the water that passes through the cloth into the container.***

You shall realize that some solid particles were not able to pass through the cloth. These are called residue. The water obtained is clean but not safe for drinking.



## Lesson 2: Cleaning Clothes

By the end of this lesson, you should be able to discuss ways of cleaning clothes in a home.

### Materials you will need

Basins, clean water, soap and dirty clothes

### Introduction

After washing and cleaning of our body, we need also to clean our clothes well. In this lesson, you are going to look at the different ways or steps you need to follow when cleaning your clothes.

During the process of cleaning your clothes, there are a number of materials you need to have. These include; basins, clean water, soap and dirty clothes. You need to wash your clothes before you wear them. This helps to remove the dirt, stains, sweat, bad smell and also kill germs in them.

There are seven main steps or stages you need to follow when cleaning your clothes. These include;

1. **Sorting** which is the act of grouping dirty clothes according to the level of dirt they have, their material and colour. This helps to make sure that very dirty clothes are not mixed with others that are not.
2. **Soaking** is where dirty clothes are first soaked in clean water with soap for some time. This makes it soft and easier for washing.
3. **Washing** involves rubbing and squeezing of the clothes in soapy water to remove dirt. This should be done thoroughly well to ensure that the dirt is completely removed.
4. **Rinsing** is the washing again of the already washed clothes in clean water to remove the soapy water. This should be done at least twice.
5. **Wringing** is the act of twisting and squeezing washed clothes to remove clean water to promote quick drying. This should be done carefully not to affect the fabric of the cloth.
6. **Drying** is where washed and cleaned clothes are exposed to sunshine to dry. This is done by hanging the clothes on a cloth wire-line. Ensure that the cloth wire-line is clean and not rusty because this can affect the washed clothes during drying.
7. **Ironing** is normally done using a charcoal or an electric iron box. Ironing of the cleaned clothes helps to kill the germs and parasites that might be in the clothes.

### *Washing dirty clothes at home*

*Materials you may needed; clean water, dirty clothes, soap and basins*

#### *Steps to follow*

*Collect some clothes for home people.*

- i) Check those with pockets to remove materials that are there.*
- ii) Group them according to their colour, material and level of dirt.*
- iii) Soak the dirty clothes in clean water with soap.*
- iv) Wash the clothes by rubbing gently the parts which are very dirty.*
- v) Rinse the cloth by squeezing it to remove out the water.*
- vi) Dry the clothes on a clean wire-line and in a dust free place.*
- vii) Iron them when dry and fold them nicely to be kept in a clean dry place.*

**THEME: HUMAN HEALTH****Topic: Accidents and First Aid****Lesson 1: Burns and Scalds**

By the end of this lesson, you should be able to describe burns and scalds and neardrowning.

**Materials you will need**

Cold water, basin and clean cloth

**Introduction**

In Primary Three, you learnt about various types of accidents that can occur at home. You also learnt about traffic accidents with other injuries like fractures, sprains, strains and dislocations. In this topic, you are going to look at more examples of accidents and their first aid; burns, scalds, poisoning, bleeding etc. First aid is the immediate help given to a casualty before he/she is taken to the hospital. This helps to save the life of the victim.

A burn is an injury on the skin caused by dry heat while a scald is an injury on the skin caused by wet heat like hot liquids and gases. Burns and scalds are commonly got from accidental fires which destroy or damage the skin and other body tissues.

Burns and scalds are classified according to the damages they cause on the skin. These include; first degree burn, second degree burn and third degree burn. In the first degree, there is no blister formed while in the second degree, a blister is formed. A blister is a raised skin with water underneath. It is not good to break those blisters. The third degree burn is the most severe burn where the skin is burnt deeply, damages the tissues making the skin appear shiny white. This can even involve bleeding.

Burn and scald accidents in young children commonly result from leaving them near fire or playing with fire materials. Therefore, young children should always be supervised to avoid such accidents.

**Activity**

In your notebook, attempt the activity below;

Mention some of the common causes of burns and scalds at home  
school

Describe some of the measures or precautions that should be taken in order to prevent burn and scald accidents at home.

What are the steps you can take when giving first aid to someone who has got a burn or a scald?

## Lesson 2: Near Drowning

By the end of this lesson, you should be able to describe near drowning.

### Materials you will need

Cold water, basin and clean cloth

### Introduction

A person may fall in water in a stream, river, pool etc. They may go down and become unable to swim to the surface. This makes such a person unable to breathe because the lungs will be filled with water. Such accidents are also common in our communities and may take someone's life.

When a person is pulled out of the water and is given first aid and the person gets back to normal life that is neardrowning. But if the person has died, then that is drowning.

Drowning and near drowning commonly happen when people fall in big water vessels such as; lakes, dams, swimming pools, big basins full of water, sewers and other water ditches. However, such accidents can also occur at home especially when young children fall into water-filled containers.

There is need to monitor young children, cover all the big containers having water in our communities, and be careful while crossing a river, stream or a water trench.

In case you notice that someone is in danger of drowning, call for immediate help so that such a person is removed from the water and given first aid by experts. Make such a victim to lie down and then press his/her belly to expel water from the lungs and the stomach. Thereafter if he/she starts to breathe normally, give him/her a kiss of life. This is the act of blowing in air into the mouth of the victim in order to restore breathing.



"kiss of life"

### Task

Move around in your home compound. Are there any open water vessels where drowning and near drowning accidents can occur? If yes, report to your parents informing them of the likely dangers. Ask them to cover such water vessels.

### Lesson: 3: Fever and Fainting

By the end of this lesson, you should be able to describe the causes and first aid for fever and fainting.

#### Materials you will need

Cold water, basin and clean cloth

#### Introduction

Apart from the forms of accidents you learnt about in your previous lessons, you also realise that there are other forms of accidents like fainting.

Fever is a condition where the body temperature goes beyond the normal of 37°C or 98.6 °F. Fever is a common sign of an illness or poisoning accidents as well. A person with fever should be given first aid by applying a clean wet cloth on the skin. This is called tepid sponging. This helps to reduce the hot body temperature. Take the victim to the nearby hospital.

Fainting is a condition in which one loses consciousness. This results from lack of enough oxygen supply to the brain. Fainting can be caused due to over excitement, anger, hearing bad or sad news, and doing vigorous exercises, etc. A person who has fainted should be made to lay down on the back with the two legs raised on a surface. This helps to allow blood with oxygen to flow to the brain. Any unconscious person can be in danger of suffocation if left lying on his/her back. Ensure that the person is put in a recovery position. In this position, the head is positioned lower than rest of the body. This makes enough blood to flow to the brain. Seek for medical attention immediately.

#### ***Project work: Performing a tepid sponging demonstration***

- 1. Get some clean water in a basin with a clean cloth.***
- 2. Ask one of your sisters, brothers or you can use a doll to act as the victim of fever.***
- 3. Remove most of the clothes from the wrist to the head and make him/her lie on the back.***
- 4. Using the wet clean cloth, pass it over the forehead, on the hands and the legs.***
- 5. Do it several times while noticing the body temperature change.***

## THEME: HUMAN HEALTH

### Topic: Sanitation

#### Lesson 1: Latrines and Potties

By the end of this lesson, you should be able to describe the differences between ordinary pit latrine, ventilated improved pit latrine, potties and water closet toilets.

#### Materials you will need

A notebook, a pen, a pencil, a latrine in the community

#### Introduction

Sanitation is the way we are able to keep our environment clean and healthy. This is through proper management of wastes. Through this, we are able to control the spread of diarrheal diseases. In this topic, you are going to learn more about the use of latrines in promotion of sanitation. A latrine is a place where human wastes are disposed of. There are different types of latrines which people use in our communities, such as pit-latrines, toilets, Ecosans and potties.

#### Pit latrines

A pit latrine is a pit dug in the ground for proper disposal of faeces and urine. This is the commonest found in villages. There are two types of pit latrines; ventilated improved pit latrines (VIP latrines) and ordinary pit latrines (convectional pit latrines).

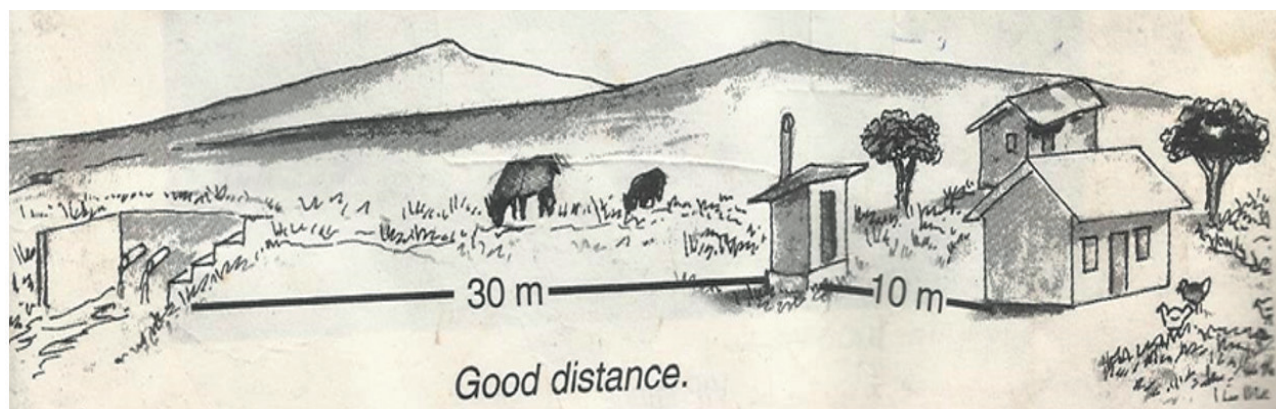
A VIP latrine is a type of latrine with a vent pipe and a screen on it while an ordinary pit latrine (convectional pit latrine) has no vent pipe. They both have covers or lids on the holes to keep away bad smell and houseflies.

#### Factors to consider when choosing a site for a pit latrine

It should be downhill (lower altitude) than a water source to prevent water contamination/water pollution.

It should be 30 meters away from a water source. This prevents water contamination.

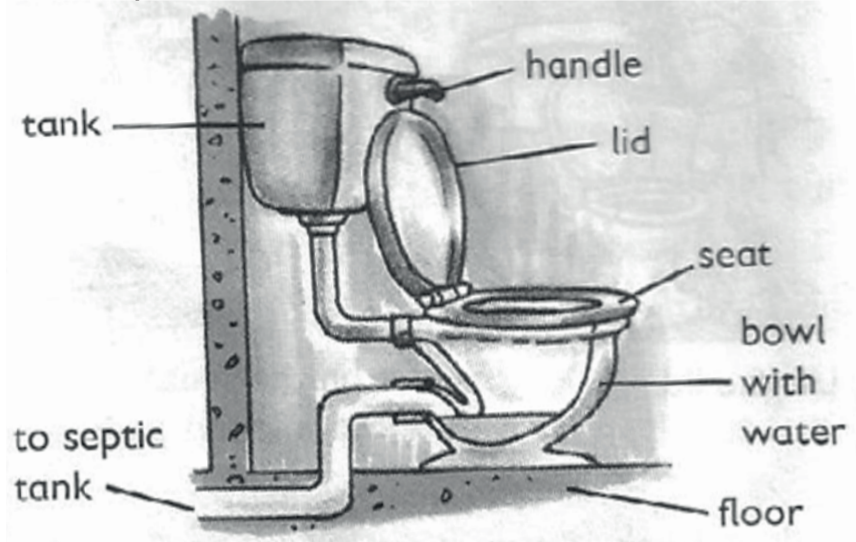
It should be at least 10 meters away from a house, school, hospital, market and kitchen to prevent bad smell where people live.





### Toilet

A toilet is a type of latrine which uses water to flush human faeces and urine into a septic tank. Toilets are common where there is piped water system.



### Potty

A potty is a small portable latrine for babies. It is a small container shaped in form of a seat of a toilet. It is usually used by toddlers who are being trained to use toilets or latrines.

### Activity

- Name the type of latrine found in your home.
- Explain the importance of having a latrine in your home.
- Identify the types of latrines in your school.
- State the importance of the screen and vent pipe in a VIP latrine.

## Lesson 2: Keeping a Latrine Clean

By the end of this lesson, you should be able to use local resources to make tools for cleaning latrines and toilets.

Materials you will need

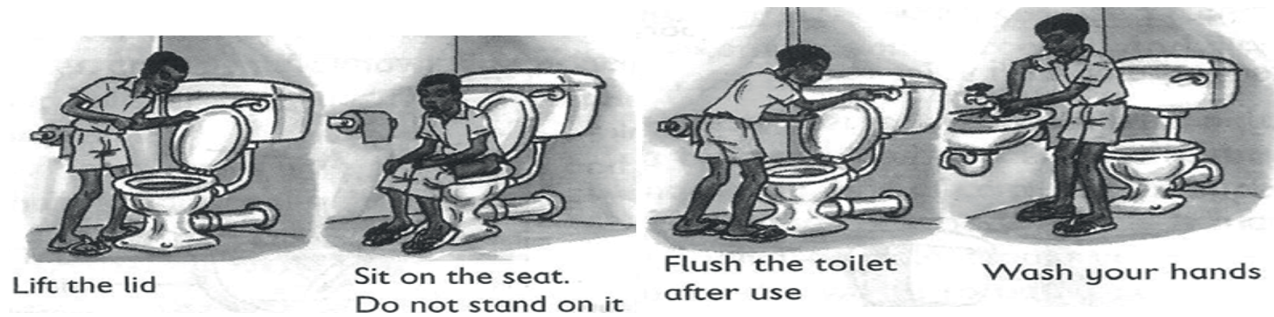
Local materials from the environment

### Introduction

In this lesson, you are going to learn more about the different ways of maintaining cleanliness of our latrines. This can be done with the help of some tools or materials. Our latrines should be used properly and kept clean always. This can be done through;

- Always sitting or squatting during urination or defecation.
- Always flushing the toilet after use.
- Using toilet paper which is soft to clean yourself after use.
- Avoiding the use of hard materials like stones or polythene papers which can block the pipes
- Always placing back the lid/cover after use.

Scrubbing the floor with a floor brush and the bowl with a bowl brush.  
Washing the bowl, seat and rim with clean water and disinfectants  
For proper maintenance of our latrines, materials can either be bought or obtained from the environment. Such materials may include; brooms, plant leaves, ash, etc.



### Activity

In four sentences, explain the stages of using a toilet as shown in the above illustrations.

How is each stage important to the user?

Mention some six different ways you can do to keep your latrine at home clean.



## THEME: HUMAN BODY

### Topic: The Reproductive System

#### Lesson 1: The Male Reproductive System

By the end of this lesson, you should be able to describe the structure and function of the male reproductive system

#### Materials you will need

Pen, pencil, notebook, chart etc.

#### Introduction

For living things to multiply, there is need to reproduce. The system in human beings that carries out this function is the reproductive system. In this topic, you are going to look at the reproductive system and its function in human beings.

Reproduction is the process by which living things produce young ones similar to themselves. It can also be defined as the ability of living things to produce and increase in number. There are two types of reproduction namely;

sexual reproduction (that involves gametes).

asexual reproduction (where no gametes are involved).

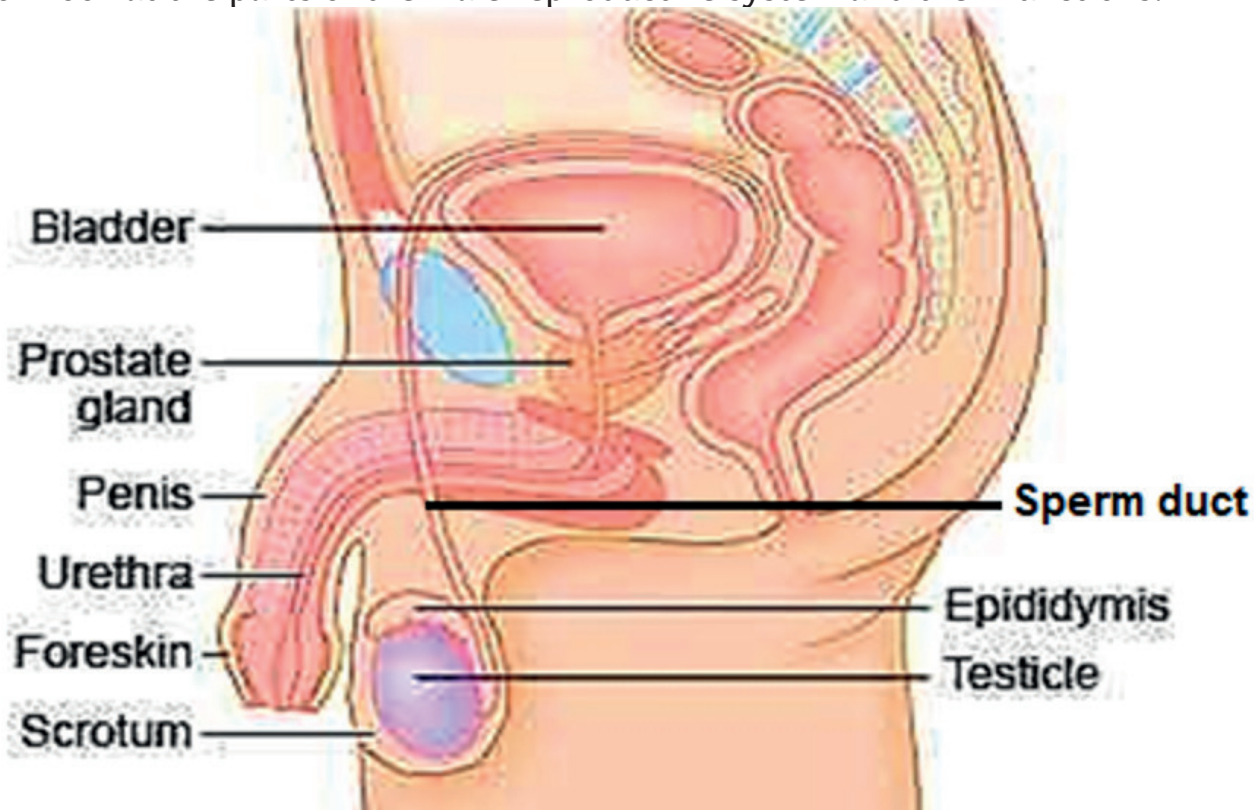
Gametes are the reproductive cells of a living organism. For example, sperms, ova, ovules, pollen grains and spores.

How is reproduction important to an organism?

Reproduction enables living organisms to remain in existence.

It enables living things to multiply or increase in number.

Now look at the parts of the male reproductive system and their functions.



### Functions of parts of the male reproductive system

| Name of part      | Function   |
|-------------------|--|
| Penis             | <ul style="list-style-type: none"> <li>To deposit sperms into the vagina during sexual intercourse</li> <li>For urination</li> </ul>   |
| Testes            | <ul style="list-style-type: none"> <li>To produce sperms</li> <li>To produce a hormone called testosterone responsible for secondary sex characteristics</li> </ul>                    |
| Epididymis        | <ul style="list-style-type: none"> <li>To store manufactured sperms</li> </ul>   |
| Scrotum           | <ul style="list-style-type: none"> <li>To protect the testes from external injuries</li> <li>To regulate temperature around the testes</li> </ul>                                      |
| Urethra           | <ul style="list-style-type: none"> <li>It is a passage of sperms from the sperm duct</li> <li>The urethra also allows urine to pass from the urinary bladder to the outside</li> </ul> |
| Sperm duct        | <ul style="list-style-type: none"> <li>It is a passage of sperms from the testes or epididymis to the urethra</li> </ul>   |
| Foreskin          | <ul style="list-style-type: none"> <li>To cover and protect the head of the penis from injuries</li> </ul>   |
| Sphincter muscles | <ul style="list-style-type: none"> <li>To control the flow of urine from the urinary bladder</li> </ul>  |
| Prostate gland    | <ul style="list-style-type: none"> <li>To produce a fluid that closes the urinary bladder during sex to prevent urine from mixing with sperms</li> </ul>                               |
| Cowper's gland    | <ul style="list-style-type: none"> <li>It produces thick mucus like fluid that lubricates the urethra</li> </ul>   |
| Seminal vesicle   | <ul style="list-style-type: none"> <li>To produce semen through which sperms move</li> </ul>   |

### Lesson 2: The Female Reproductive System

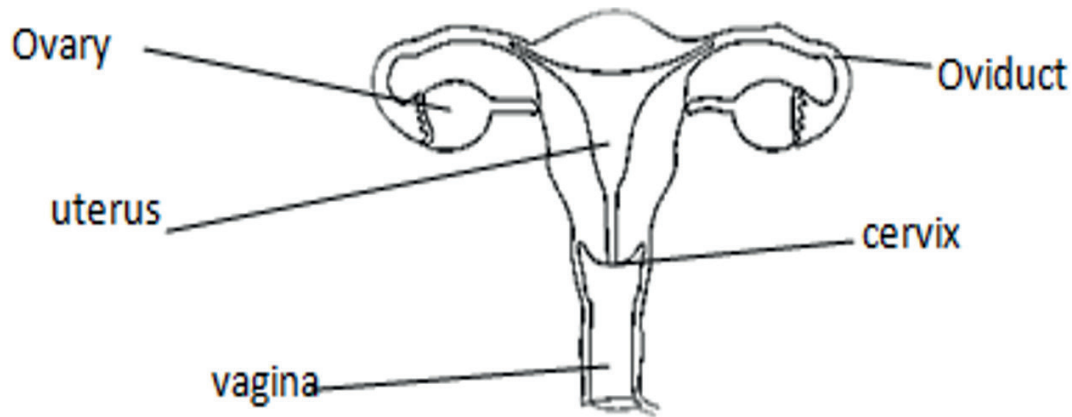
By the end of this lesson, you should be able to describe the structure and function of the female reproductive system.

#### Materials you will need

Notebook, pens, pencil

#### Introduction

In this lesson, you are going to learn about the female reproductive system of human beings. The female reproductive system has got different parts. The parts have different functions just like the way you saw in the male reproductive system.



### Function of each part of the female reproductive system

| Name of the part       | Function  |
|------------------------|---|
| Ovary                  | To produce and store female gamete called ova   |
| Oviduct/fallopian tube | This is where fertilization takes place<br>It allows passage of the ovum to the uterus                      |
| Vagina                 | Receives sperms during sexual intercourse/mating<br>It also acts as the birth canal                         |
| Uterus/womb            | It is where implantation takes place<br>It provides suitable conditions for the growth of the baby (foetus) |
| Vulva                  | It is an opening to the vagina which receives and directs the penis during mating                           |
| Cervix                 | It closes the lower end of the uterus during pregnancy  |

### Activity

In your notebook, write down some of the materials we can use to clean our reproductive organs.

State some of the different ways of cleaning your reproductive organs.

Share your findings with your parent for more guidance.

### Lesson 3: Body Changes in Boys and Girls during Puberty

By the end of this lesson, you should be able to distinguish body changes during puberty between boys and girls.

#### Materials you will need

Book, pens, pencils

#### Introduction

In this lesson, you are going to learn about body changes in boys and girls during puberty. Growth refers to increase in size of an organism. A girl or a boy may grow tall, fat or gain more weight. We can tell that a person is growing up through observations.

As a girl or a boy grows, there are changes which take place in their bodies that enables them to become mature or an adult. This is referred to as development. We cannot see these changes but we can observe changes in behaviour. Growth and development cannot be separated because they take place at the same time. However, there is rapid growth and development starting at puberty. Puberty is a period of sexual maturity of the reproductive organs or a period in which the reproductive organs become sexually mature. Puberty can also be defined as a period of sexual maturity in boys and girls.

**Puberty** begins earlier in girls than in boys but it varies from individual to individual. In general, however, puberty in girls starts between 12 and 14 years and may end at 21 years while in boys it may begin between 14 years and ends at 21 years. At this stage, the boy or girl is referred to as an adolescent. Therefore, adolescence is a stage in development between childhood and adulthood.

There are changes that take place during puberty. These changes may be on the body (physical changes), in the way the person feels (emotional changes) or the way the person lives with others (social changes). Some of the physical changes include the following;

| Physical changes in girls during puberty                | Physical changes in boys during puberty                                    |
|---|--|
| Development of ovaries and uterus                       | Enlargement of the penis and testes  |
| Production of ova (ovulation starts)                    | Production of sperms and semen   |
| Menstruation period starts                              | Experiencing wet dreams.   |
| Sweat glands become more active                         | Sweat glands become more active  |
| Growth of pubic hair and armpits                        | Growth of pubic hair and hair in the armpits, on the chest and on the face |
| Voice softens and becomes attractive                    | Voice breaks and becomes deep  |
| Hips become wider which helps with child birth later on | Body becomes more muscular and the shoulders broaden                       |

|                                   |                       |
|-----------------------------------|-----------------------|
| Development and growth of breasts | Increased growth rate |
| Increased growth rate             |                       |

**Activity**

Share with your parent or guardian about the body changes which take place in the body of both boys and girls.

Are there some changes you have noticed already on your body? Write them in your notebook.

Write down those that are yet to occur or you have ever seen from friends or age mates.

**Lesson 4: Teenage Pregnancy**

By the end of this lesson, you should be able to explain the dangers of teenage pregnancy.

**Materials you will need**

Book, pens, pencils

**Introduction**

In this lesson, you are going to learn about teenage pregnancy. Having babies before the age of 20 increases the health risks for both the baby and the parents. A teenager is a person between 13 and 19 years of age. Teenage pregnancy is acquired by a girl below 20 years of age.

**Causes of teenage pregnancy**

- **Peer pressure:** A girl may want to have sex because her friends are doing it and are happy about it.
- **Defilement:** This is an act of an adult having sexual intercourse with a child below the age of 20 years.
- **Rape:** This is an act of forcing a person into sexual intercourse against his or her will.
- **Desire for luxury or material things:** Some girls may have interest in having expensive things. This leads them to have sexual relationships with men for money. Such a relationship can result into early pregnancy.
- **Drug abuse:** Some girls are influenced by their peers to begin using drugs like alcohol, etc.
- **Failure to provide enough basic needs to a girl child by the parents.**

**Dangers or effects of teenage pregnancy**

- Loss of school education
- Obstructed labour
- Difficulty in child birth
- Attempt to have an abortion

- Rejection by parents
- Lack of financial support

However, when a girl or woman becomes pregnant, she should be given the following care;

- Antenatal care
- Good nutrition
- Adequate rest and sleep
- Physical exercises
- Appropriate clothing like maternity dresses and brassier
- Proper personal hygiene

### Activity

With the consultations from your parent, discuss more about the dangers resulting from teenage pregnancy. How can you safeguard against it?

Take a study in your community; are there some young girls who got pregnant? What were the causes?

Write a poem on how children in your community can avoid teenage pregnancies.

## Lesson 5: Family Planning

By the end of this lesson, you should be able to describe methods of birth control.

### Materials you will need

Books, pens, pencils

### Introduction

In this lesson, you are going to learn about family planning. When using family planning, a couple is able to decide on the number of children they want and when to have each of them. Therefore, family planning is the use of birth control methods to plan when to have and not to have a baby in a family. Family planning depends on using birth control methods. Birth control is the intentional prevention of pregnancy.

What is child spacing? Child spacing is the provision of regular intervals of time between the births of children in a family.

### Advantages of family planning

- Enables the parents to have a baby at the time they are ready for it.
- Enables the parents to produce the number of children they can manage to look after.
- Enables the child born to get enough care.
- Prevents a woman from being weakened by child bearing.
- Prevents maternal anaemia.



- It controls rapid population growth.
- It enables the mother's body to rest and prepare for the next pregnancy.
- It prevents the producing of underweight babies.
- It prevents unwanted pregnancies.

### Methods of family planning

- Natural methods of family planning
- Artificial methods of family planning

Natural methods of family planning are methods of family planning which don't involve use of drugs or operation.

Artificial methods of family planning are methods of family planning which involve the use of drugs or artificial materials to prevent pregnancy.

Methods of family planning, examples and advantages and disadvantages

| Methods                                | Examples   | Advantages  | Disadvantages   |
|--|--|---|---|
| <b>Natural family planning methods</b> | <ul style="list-style-type: none"> <li>• Prolonged breastfeeding</li> <li>• Abstinence/ abstaining from sex</li> <li>• The rhythm method (use of safe days)</li> <li>• Cervical mucus method</li> <li>• Withdrawal method</li> <li>• Basal body</li> <li>• Temperature method</li> </ul> | <ul style="list-style-type: none"> <li>• They are cheap and easy to use</li> <li>• They have no side effects</li> </ul> | <ul style="list-style-type: none"> <li>• They are risky and may not be very effective.</li> <li>• They need a lot of cooperation between the male and female partner.</li> <li>• They don't control the spread of STDs except abstinence</li> </ul> |



|   |  |  |   |
|---|--|--|---|
| <b>Artificial family planning methods</b> | <ul style="list-style-type: none"> <li>• Use of birth control pills</li> <li>• Use of birth control injections</li> <li>• Tubal ligation</li> <li>• Vasectomy</li> <li>• Norplant</li> <li>• Use of foams and jellies</li> <li>• Diaphragm</li> <li>• Use of condoms</li> <li>• Looping method/coils/</li> <li>• Intra Uterine Device</li> </ul> | <ul style="list-style-type: none"> <li>• They are very effective</li> <li>• They are commonly available</li> </ul> | <ul style="list-style-type: none"> <li>• They are expensive to maintain.</li> <li>• They can cause health problems to the woman's body.</li> <li>• They should be used under the supervision of a health worker.</li> </ul> |
|---|--|--|---|

### Summary

Breast feeding is very helpful in family planning because it delays ovulation after pregnancy and giving birth.

Withdrawal method is where a man removes the penis from the vagina during sex as soon as he notices that he is about to ejaculate.

The rhythm is the studying of the menstrual cycle and sex is only restricted on days when the ovum is absent from the oviduct.

Abstinence refers to avoiding sex completely for some time and it is the best for school going pupils.

Birth control pills are small tablets containing chemicals which prevent pregnancy by not allowing ovulation to take place.

Birth control injections are when hormones which prevent pregnancy are given through injection after a special period.

### Guided discovery

How many children are you in the family?

What is the age difference from one another?

Find out from one of your parents why you the children have different years of birth.

## Lesson 5: Diseases and Disorders of the Reproductive System

By the end of this lesson, you should be able to identify diseases and disorders of the reproductive system.

### Introduction

The reproductive system, like any other system of the body, can fail to work well if it is not properly cared for. It can be attacked by some diseases and disorders.

In this lesson, you are going to learn about disorders and diseases of the reproductive system, their causes, signs and symptoms and their prevention. The disorders of the reproductive system include; ectopic pregnancy, infertility, miscarriage, blocked oviduct, and fibroids, among others. For the organs of the reproductive system to function properly, they should be kept in good health.

This can be done through;

Observing proper hygiene.

Wearing clean and large (free) underwear.

Feeding on a balanced diet.

Abstaining from sex till marriage.

### Task

With the help from your parent or guardian, complete the table below about the common diseases of the reproductive system.

| No. | Disease     | How it is spread | Prevention and control |
|-----|-------------|------------------|------------------------|
| 1   | Gonorrhoea  |                  |                        |
| 2   | Syphilis    |                  |                        |
| 3   | HIV/AIDS    |                  |                        |
| 4   | Candidiasis |                  |                        |





National Curriculum  
Development Centre,  
P.O. Box 7002,  
Kampala.

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