

ACCELERATED LEARNING PROGRAM

SCIENCE

LEVEL 1



SECRETARIAT OF EDUCATION
NEW SUDAN

ACCELERATED LEARNING PROGRAM

SCIENCE

LEVEL 1

Secretariat of Education

New Sudan

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SUDAN BASIC EDUCATION PROGRAM

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UNIT 1

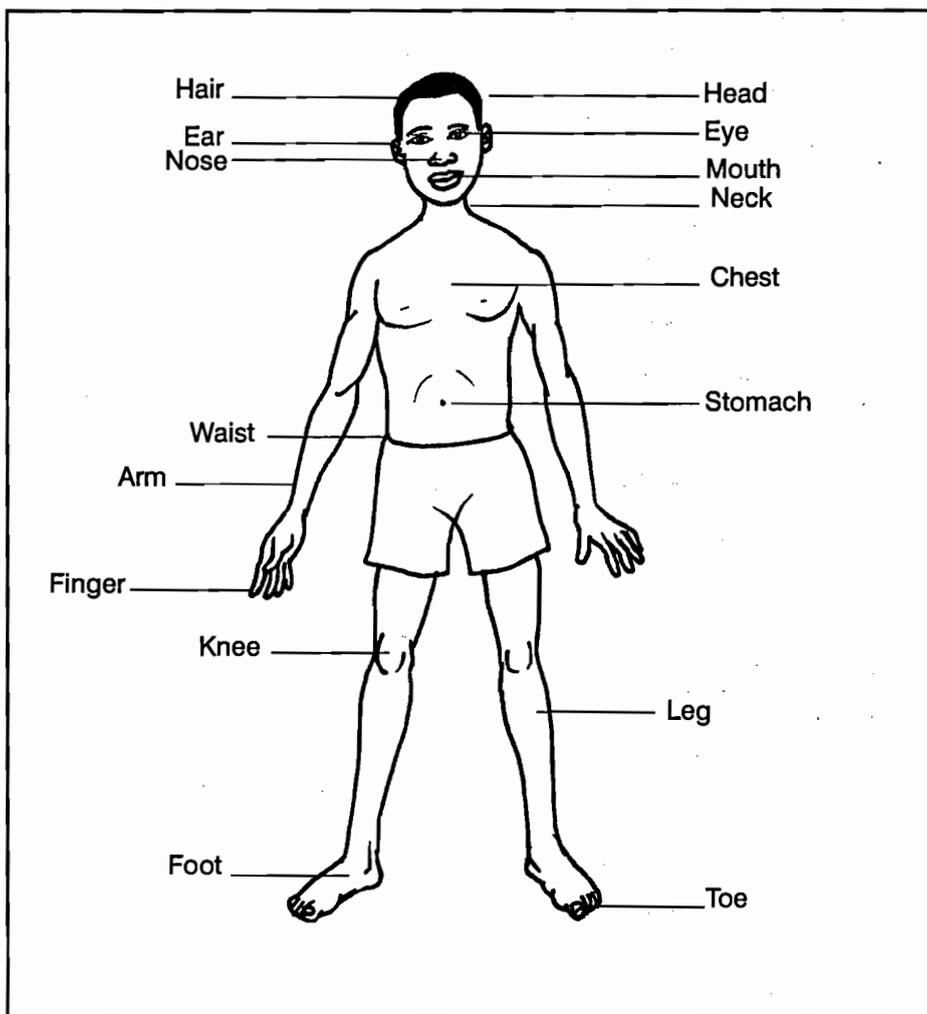
Health Education

Our bodies should look well, feel well and work well. When something is wrong with our bodies, we are sick. For example, we may have a headache, body pains or other problems.

1.1 The Body

Parts of the body

Look at this picture, which shows parts of the body. Can you name these parts of your body?



Why do we need to know the parts of our bodies? We need to know the parts of our bodies so that we can show our parents or a doctor or nurse if something is wrong with any part of our body.

Activity: Match the body part with its function.

- | | |
|----------|-------------|
| 1. eye | A. walking |
| 2. legs | B. eating |
| 3. ears | C. seeing |
| 4. nose | D. hearing |
| 5. mouth | E. smelling |

1.2 Importance of Cleaning the Body

A. Teeth

Brush your teeth every morning and after meals. You should brush your teeth every day. What do you use for brushing your teeth?

1. Brush sticks
2. Toothbrush

This is how you should brush your teeth:

1. Brush the front upper and lower teeth using up-down strokes.



2. Brush the inside of the upper teeth.



3. Brush the inside of the lower teeth.



4. Brush your tongue to remove any bad odour.



5. Rinse your mouth well with clean water.



If you don't brush your teeth you will have tooth decay and your mouth will smell bad.

Questions:

1. Did you brush your teeth this morning?
2. Did you brush your teeth last night?

B. Face



Dirty face



Clean face

If you wash your face often, you will feel healthy and fresh. When you wash your face, don't forget to wash your neck.



Questions

1. Did you wash your face today?
2. Did you use soap?

C. Washing the body

We should keep our bodies clean by taking a bath every day. We use soap and water to wash our bodies. Having a dirty body can make you ill.

We clean our bodies to:

1. Feel fresh
2. Smell good
3. Remove sweat after work or play
4. Remove dirt.

Use a basin of water and throw the water over you as in the picture.



Questions:

1. Do you take a bath everyday?
2. When do you take a bath?
3. Where do you take a bath?

D. Hands

What do we use our hands for? Here are some things we use them for:



Eating



Washing dishes



Greeting people

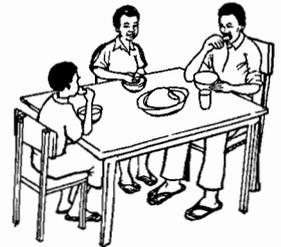


Holding and carrying things

From these activities, our hands can get dirty. We should wash our hands often, using water and soap. We should wash our hands after visiting the toilet. We should wash our hands before and after eating.



We should wash our hands after visiting the toilet.



We should wash our hands before and after eating.

Questions:

1. How many times a day do you wash your hands?
2. Do you always wash your hands after you go to the toilet?

E. Hair

Our hair must be kept clean all the time.

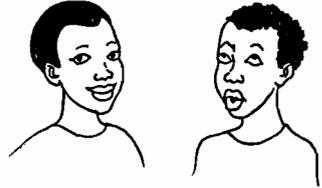
Why should we keep our hair clean?

- So that we don't get lice
- To avoid dandruff
- To make us look good



We keep our hair neat and clean by

- Washing it
- Combing it
- Keeping it short



How to wash your hair:

1. Wet your hair with water
2. Put soap on your hair
3. Scrub your hair with your fingers until the soap foams
4. Rinse your hair with clean water until the soap has been washed out
5. Dry your hair with a towel or a clean piece of cloth

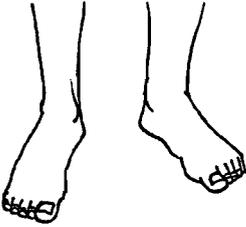


Questions:

1. How often do you wash your hair?
2. Does your hair look good?

F. The feet

It's important to keep your feet clean and to wear shoes. If you don't wear shoes you can get jiggers and fungi.



These are the things we use for washing our feet:

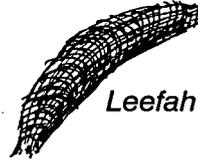
- Water
- Basin
- Soap
- Local sponge (leefah)
- Scrubbing stone



Basin of water



Soap



Leefah



Scrubbing stone

Don't forget to wash between your toes!

Questions:

1. How can you keep your feet clean?
2. Do you always wear shoes?
3. Do you have jiggers or fungi? Check your feet.

G. Toenails

Toenails get dirty easily. Dirty toenails can become infected, so you should cut and clean them often.



We keep our toenails clean by:

- Washing them with soap and water.
- Cutting them with a razor blade or nail clippers.

You should be careful not to cut yourself when using a razor blade. Don't share razor blades because you can get HIV/AIDS if you share razor blades with someone who is infected with HIV.



Questions:

1. What do you use to cut your toenails?
2. How often do you cut your toenails?

Exercise: Choose one of the words for each sentence.

wash my hands
comb my hair
soap and water
every morning

1. I use _____ to wash my face.
2. I _____ to look good.
3. I brush my teeth _____.
4. I _____ before eating.

1.3 Washing Clothes

The Importance of washing clothes

Washing clothes is very important. We wash our clothes when they are dirty. We look good in clean clothes. Look at the clothes of the members of your class. Name the members who have the cleanest clothes.



Clean clothes



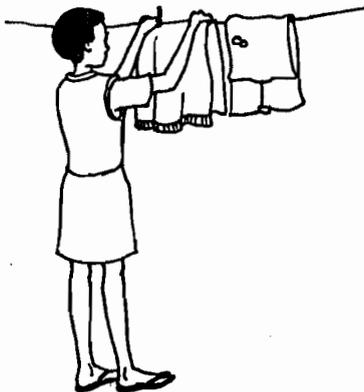
Dirty clothes

The process of washing clothes

To wash clothes you need the following items:

- a) Basin
- b) Soap
- c) Water
- d) Clothesline

First, separate the white clothes from coloured clothes. Wash the white clothes first. Add soap to the water, then scrub the clothes to remove dirt. Rinse the clothes twice, then hang the clothes on the clothesline with pegs or clips.



A woman hanging clothes on a clothesline

After washing the white clothes, continue by washing the coloured clothes.

Questions:

1. Where do you wash your clothes?
2. When do you wash your clothes?
3. What do you use to wash your clothes?
4. Where do you keep your clean clothes?
5. Who washes your clothes?
6. Why should you separate white clothes from coloured clothes before washing?

1.4 The Dangers of sharing Clothes

Some people like to share items like sweaters, jackets, socks, skirts, shorts and shoes. Other people buy used clothes and shoes. People like to share clothes with their brothers and sisters or friends.

Sharing clothes isn't good. Scabies and ringworm are spread by sharing clothes. Also, small parasites like lice and fleas are spread this way. Diseases like the common cold and coughs are spread by sharing handkerchiefs.



Questions:

1. What diseases can you get if you share your clothes?
2. What diseases can you get when you share your handkerchief?

Exercise: Choose the correct word.

1. We use _____ to wash clothes.
dirt soap lice
2. _____ are spread by sharing clothes.
soap lice shoes
3. _____ are spread by sharing a handkerchief.
scabies colds soap
4. _____ your clothes twice.
rinse wash soap

1.5 The importance of food

Food is very important to us. Everyone needs food and most people eat three meals a day. The meals are called breakfast, lunch and dinner.



Exercise: Write the name of the food with the picture in the space provided.

maize

okra

eggs

tomatoes

rice

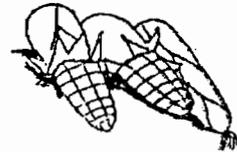
cassava

groundnuts

sweet potatoes



(a) _____



(b) _____



(c) _____



(d) _____



(e) _____



(g) _____



(h) _____



(f) _____



Food gives us energy and makes us strong. These children have a lot of energy because they have eaten good food.



Some children are weak. They cannot play because they don't eat good food to make their bodies strong and healthy.



The man in this picture is cutting down a tree. He's very strong because he eats good food.

Food is important because:

1. It gives us energy and strength
2. It enables children to grow
3. It protects our bodies from disease

Types of Food

Our bodies need different kinds of food to be healthy. The three main types of food are:

1. Body-building food (protein)
2. Energy food (carbohydrates)
3. Protective food (that contains vitamins and minerals).

Sources of Protein, carbohydrates and vitamins:

1. Body-building foods are meat, beans, fish, eggs, milk, chicken.
2. Energy foods are cassava, maize, rice, etc.
3. Protective foods are oranges, lemons, pawpaw, mangoes, okra, greens and other fruits and vegetables.

Questions:

1. What is protein? Give examples.
2. What are vitamins and minerals? Give examples of foods that have them.
3. Why are some children weak?
4. What should we eat to be strong?

Exercise: Put one word in each sentence:

vitamins protein strong weak

1. Eating chicken will give you _____.
2. You will feel _____ if you don't eat good food.
3. Good food will make you _____.
4. Eating vegetables and fruit will give you _____.

1.6 The Importance of Exercise

Sports and exercise are good for the body. At school pupils have time for physical education and games. Adults may be too busy to exercise, but they should try to do it every day.

People participate in sports and exercise for enjoyment. It makes us feel good. The legs and chests of people who participate in games and exercise develop strong muscles. Games and exercise keep our bodies healthy.

Exercise: Look at these pictures. What are the games shown in each picture?



Questions:

- 1 How often do you exercise?
2. Name the games and exercises you take part in.
3. Name three ways that games and exercise are important for our bodies.

1.7 Sleep and Rest

Sleep and rest are very important in our lives. When we work or play we get tired. We need to rest. We have tea breaks and lunch break at school and at work to rest. Look at these people. They are sleeping.

When do you sleep? People sleep at night. Some people also take a short nap after lunch.



Exercise:

Look at the pictures and say what the people are doing. All of these people will need to rest after they finish what they are doing. We also rest after walking long distances. We sleep and rest to keep our bodies healthy.



Questions:

1. Why do we need to sleep and rest?
2. When do you sleep and rest?
3. Do you sleep during the day?
4. How many hours do you sleep at night?
5. What time do you go to sleep?
6. What time do you get up?

UNIT 2

Animals

2.1 Tame and Wild Animals

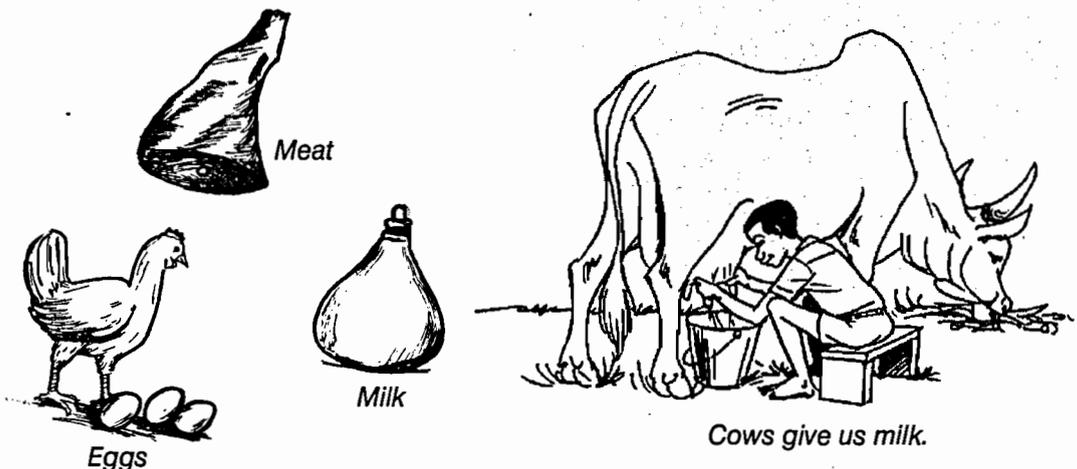
Animals that we keep at home are called “tame” or “domestic” animals. We keep animals at home to eat or to do work for us. We also keep them as pets. Wild animals live in the bush. Some of them are dangerous. Animals like cows, dogs, chicken, and cats are tame. Animals like rats, hyenas and lions are wild animals.

Questions:

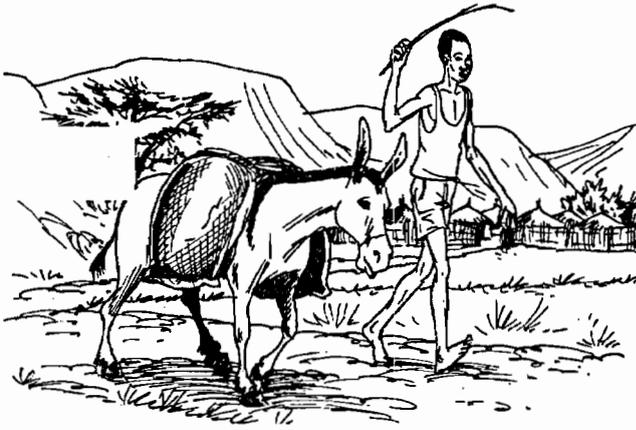
1. Which animals are kept at home? (domestic animals)
2. Which animals are found in the bush? (wild animals)
3. Which animals are dangerous?
4. Which animals aren't dangerous?

2.2 How do animals help us?

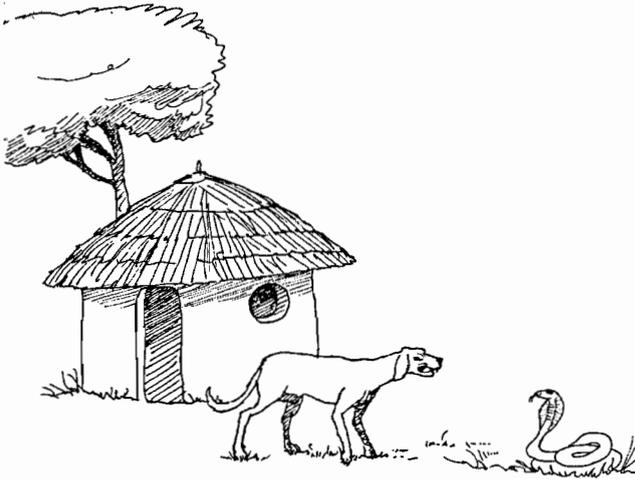
Animals can help us. We kill animals to eat. Chickens gives us eggs, and we can use the hides of some animals. Most people like to eat meat. They kill tame animals such as cows and goats to eat. They also kill some bush animals to eat.



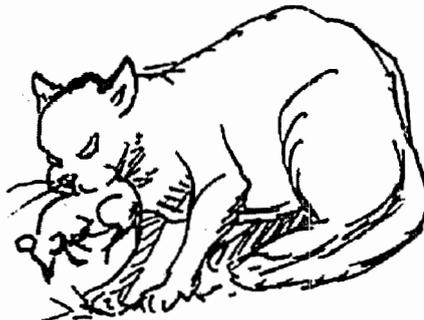
Donkeys carry loads for us.



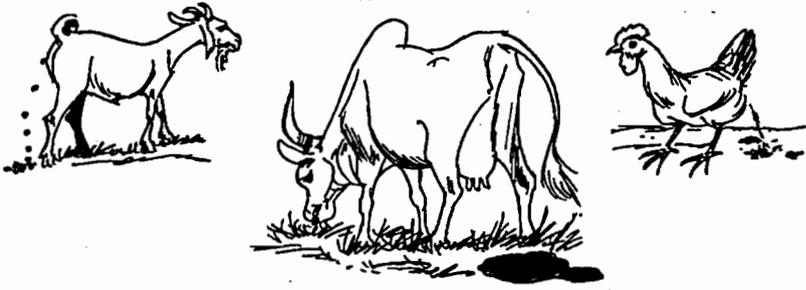
Dogs protect our homes.



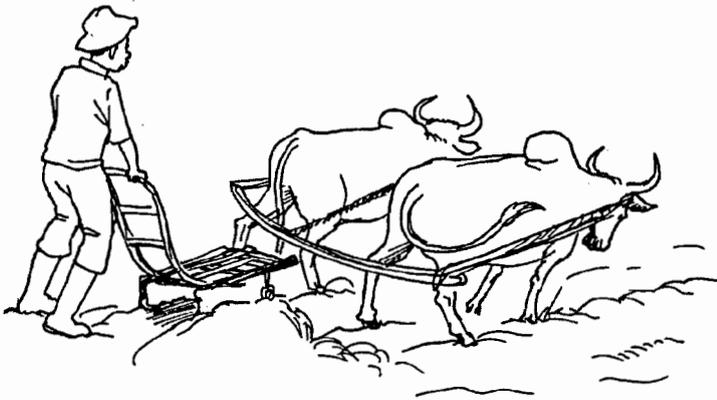
Cats help us because they catch rats. Rats are dangerous because they carry disease.



Animals give us manure. Manure is fertilizer which helps plants grow well.



A farmer can use oxen to pull a plough. This makes his work much easier.



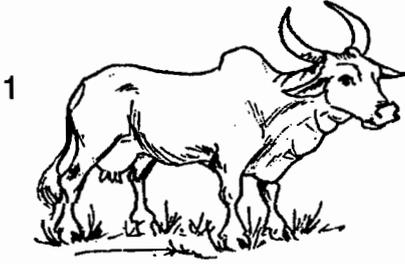
Exercise 1: *How do we use animal hides? Think of all the things that you make with animal hides.*



Exercise 2: Look at these pictures and answer the questions.

Which animals are useful to us? How are they useful?

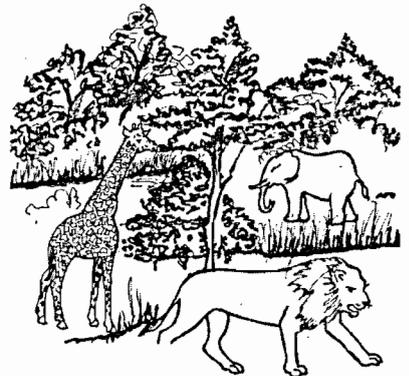
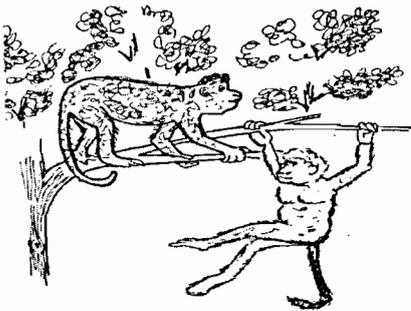
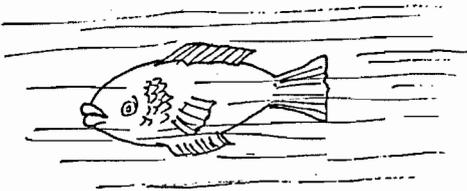
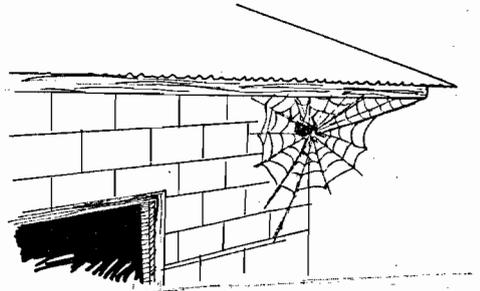
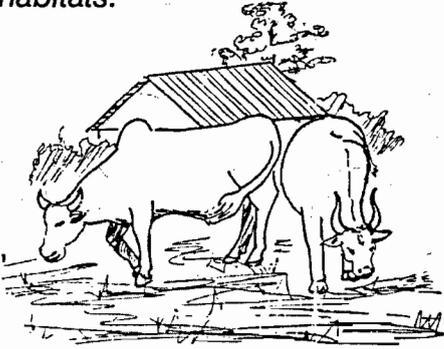
Which animals are harmful? How are they harmful?

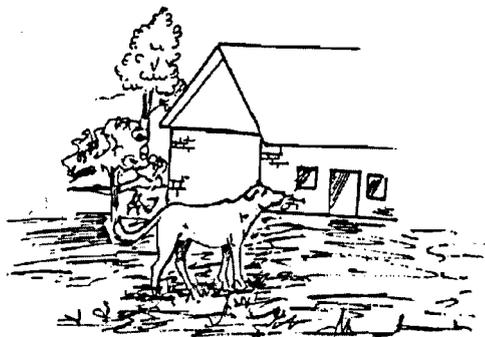
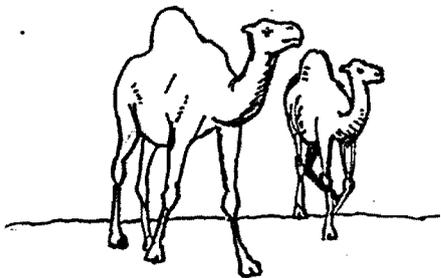


2.3 Animals and their habitats

A place where an animal lives is called its habitat. It's the place where the animal lives and the area where it looks for food. Different animals have different habitats. Animals living in the forest are called wild animals. Animals living on farms are called domestic animals. Water animals live in the water.

Exercise: Look at the following pictures and identify the animals and their habitats.

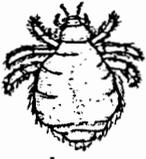




Exercise 2: *Make sentences about the habitats of animals from this table.*

Animals	Where they live (habitat)
<ul style="list-style-type: none"> • Fish • Crocodile • Ducks 	<ul style="list-style-type: none"> • Water
<ul style="list-style-type: none"> • Housefly 	<ul style="list-style-type: none"> • Garbage • Dirty places
<ul style="list-style-type: none"> • Lion • Giraffe • Elephant 	<ul style="list-style-type: none"> • Forest and plains
<ul style="list-style-type: none"> • Birds 	<ul style="list-style-type: none"> • Trees
<ul style="list-style-type: none"> • Mosquitoes 	<ul style="list-style-type: none"> • Stagnant water
<ul style="list-style-type: none"> • Camel 	<ul style="list-style-type: none"> • Dry areas (Desert)
<ul style="list-style-type: none"> • Cockroaches 	<ul style="list-style-type: none"> • Dark corners
<ul style="list-style-type: none"> • Millipedes 	<ul style="list-style-type: none"> • Under stones and in soil
<ul style="list-style-type: none"> • Cows, goats, donkeys 	<ul style="list-style-type: none"> • Farms
<ul style="list-style-type: none"> • Spider 	<ul style="list-style-type: none"> • In cobwebs

Exercise 3: Where do we find these animals?



Louse



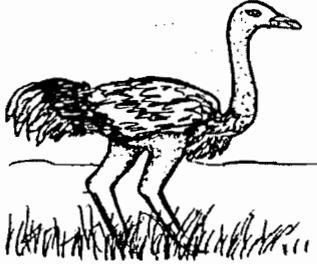
Frog



Snail



Vulture



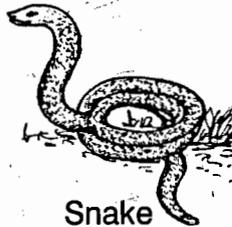
Ostrich



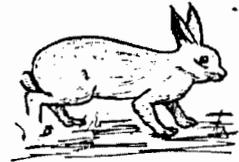
Cat



Cock



Snake



Rabbit

Exercise 4:

1. A habitat is a _____
2. _____ and _____ are examples of wild animals.
3. Wild animals live in _____.
4. Examples of water animals are _____, _____ and _____
5. _____, _____, _____ and _____ are examples of domestic animals.

2.4 Living and Non-living Things

Things that grow, feed and reproduce are called living things. Things that don't grow or reproduce are called non-living things.

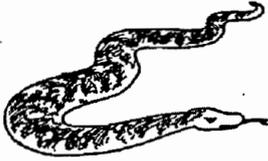
Living things

Living things are divided into two categories: animals and plants.

1. **Animals:** *What are the names of the animals in this picture?*



(a)



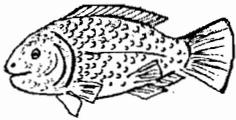
(b)



(c)



(d)



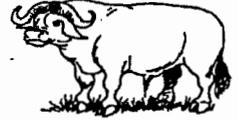
(e)



(f)

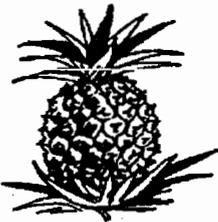


(g)



(h)

2. **Plants:** *Name the plants in this picture.*



Exercise:

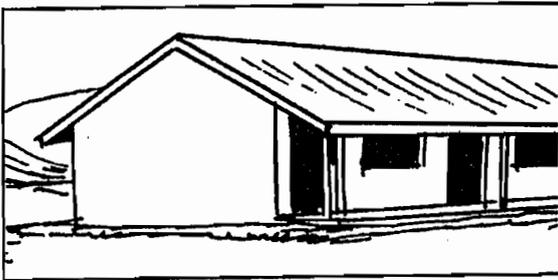
1. Draw four pictures of living things.

2. Give names of three plants that grow in your school compound.

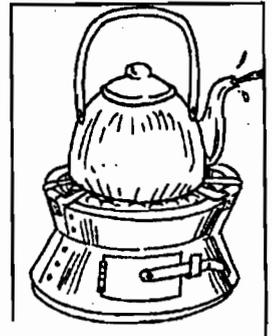
1.....2.3.

Non-living things

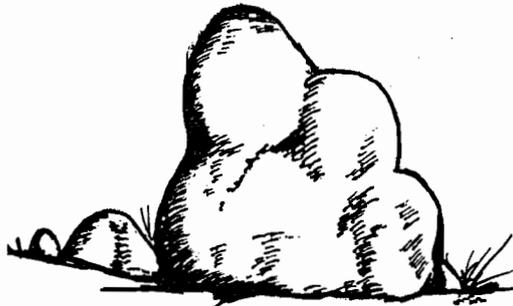
Non-living things don't have life. Here are pictures of some non-living things. Can you name them?



(a)



(b)



(c)

Activities:

1. Draw four pictures of non-living things.

2. List four non-living things in your school compound.

1. 2.

3. 4.

2.5 Differences between Living and Non-Living things

Look at this chart and compare living and non-living things:

Living Things	Non Living Things
a) They move b) They feed c) They grow d) They reproduce e) They feel and respond to the environment	a) They do not move b) They do not feed c) They do not grow d) They do not reproduce e) They do not feel and respond to environmental changes

Plants are living things because they feed from the soil and make food from the sun. They also grow and increase in size. A stone does not feed or grow. It does not reproduce. It is a non-living thing.

Science Activity:

1. Collect several living and non-living things.
2. Observe the living things and how they feed, grow and reproduce.
3. Observe other characteristics.
 - a) How do they behave when you touch them?
 - b) Do they move?
 - c) Do they make any sounds?

Exercise: Write either "animal" or "plant".

animal plant

1. A cow is an _____.
2. A tree is a _____.
3. We grow _____ in our garden.
4. We keep _____ in our compound.
5. Maize is a _____.
6. Chickens are _____.

2.6 Classification of Animals

Animals can be classified/grouped into the following classes:

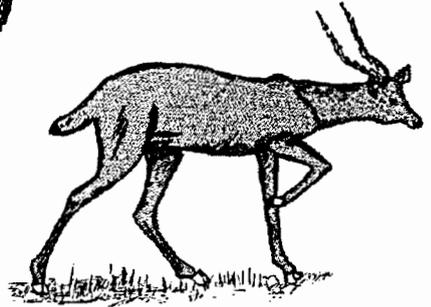
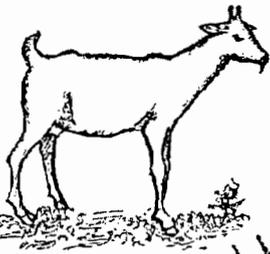
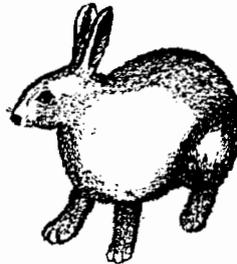
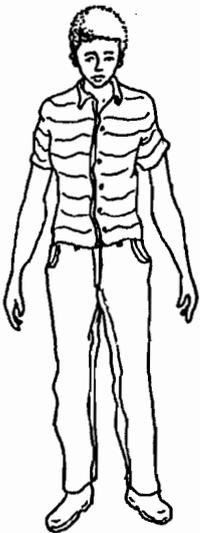
- Mammals
- birds
- insects
- reptiles
- fish
- amphibians

Mammals

Mammals are animals that:

1. Give birth to their young
2. Produce milk for their young
3. Have hair or fur on their bodies

The animals in these pictures are all mammals. Can you name them?



Questions:

1. What mammals do you have at home?
2. Why are both humans and zebras called mammals?

Birds

Birds lay eggs and their bodies are covered with feathers. Birds have wings and they can fly.

Examples of birds are doves, ostriches and ducks.



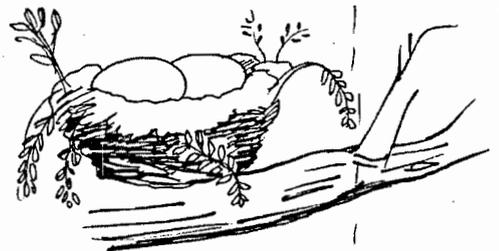
Many kinds of birds live in trees.



Birds can fly.



*The ostrich cannot fly.
It lives on the ground.*



Birds lay eggs.

Questions:

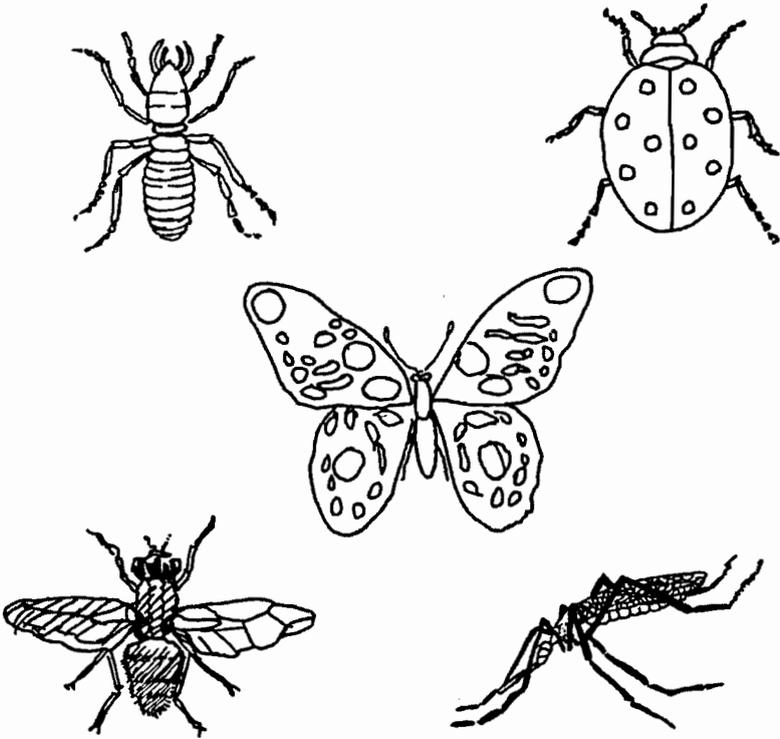
1. What kinds of birds do you have at home?
2. What kinds of bird eggs do you eat?

Insects

Insects are small animals. Their bodies are divided into three parts: head, thorax and abdomen. They have six legs and a pair of feelers. Some insects have wings and can fly. They have two pairs of wings.

Examples of insects are butterflies, mosquitoes, houseflies, termites and beetles.

Exercise: *These animals are all insects. Can you name them?*



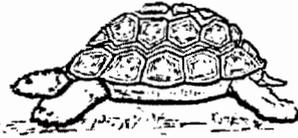
Questions:

1. How many legs do insects have?
2. What insects are helpful to us?
3. What insects are harmful?

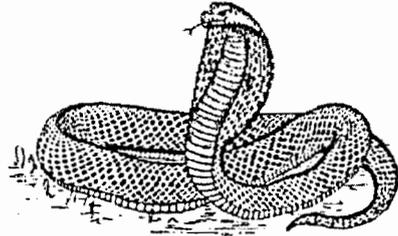
Reptiles

Reptiles are animals whose bodies are covered with scales. Most reptiles lay eggs. Some have no legs (snakes) and some have short legs. Some reptiles live in water (crocodiles) while others live on land (tortoises, snakes, lizards and chameleons).

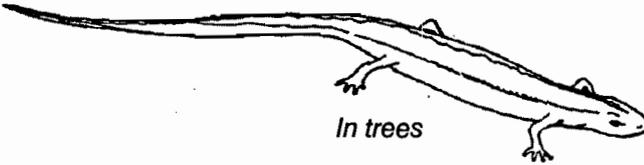
Where do reptiles live?



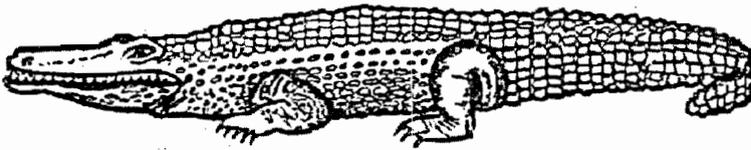
On land



In holes



In trees



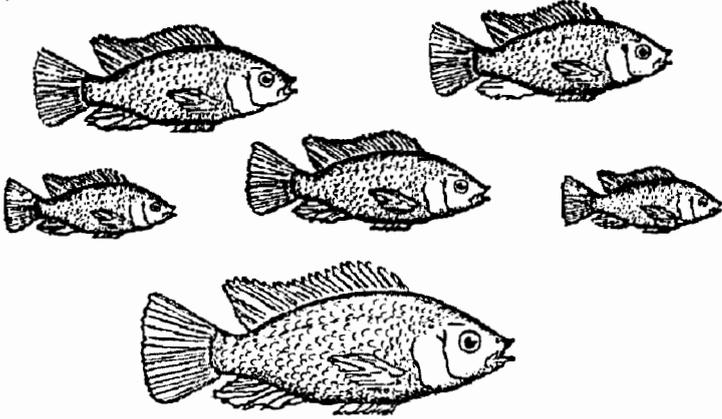
In the water

Questions:

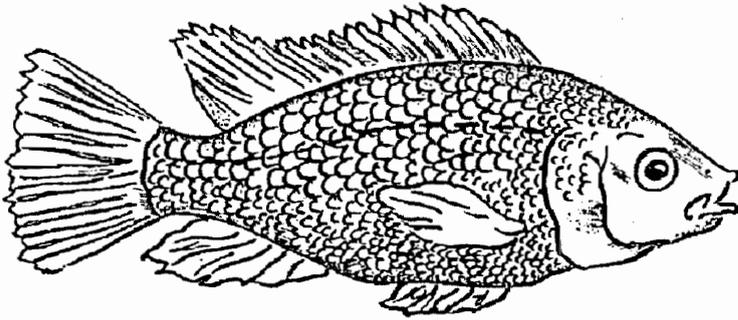
1. Which reptiles are dangerous?
2. Do you keep any reptiles as pets?

Fish

Fish live in the water. Most fish have bodies covered with scales but some fish such as mudfish don't have scales. Fish lay eggs in the water. Fish have fins, which they use for swimming.



Fish live in the water.



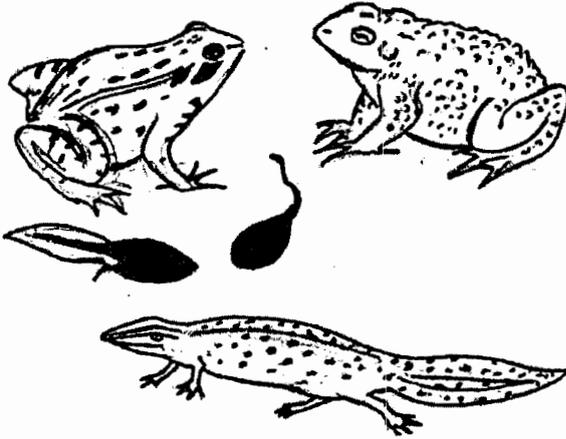
Fish have scales and fins.

Questions:

1. Do you ever catch fish?
2. How do you catch fish?

Amphibians

Amphibians are animals that live both on land and in the water.
Examples of amphibians are frogs and toads.



Questions:

1. Can you catch a frog?
2. Where do frogs live in your area?
3. What sound do frogs make?

Revision Exercise:

1. List four characteristics of living things.
2. Give three differences between living things and non-living things.

UNIT 3

Plants

Plants are living things that contain a green substance called chlorophyll. Most plants have roots, stems and leaves but some kinds of plants don't have them.

3.1 Plants Found In Different Habitats

A place where a plant grows is called its habitat.

a) Garden Plants

These are plants that we grow in our gardens and on our farms. Examples of garden plants are sesame (simsim), cassava, sweet potatoes, okra and pumpkins.

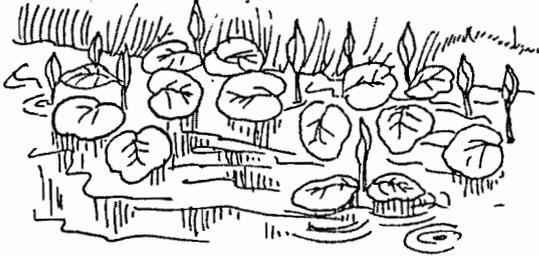
Exercise: *What are the names of these food plants?*



b) Water Plants

These are plants that grow in the water. Some of them float on the water and some of them live under the water. Examples of water plants are water lilies and water lettuce.

Water lilies



c) Forest Plants

These are plants and trees found in the forest. Some examples of forest plants are mahogany, teak, lulu and palm trees.

Forests plants



d) Desert Plants

These are plants found in the desert. Examples of desert plants are cactus, euphoria and lalob. Deserts are dry areas and desert plants don't need much water.

Cactus



Euphorbia



e) Homestead Plants

These are plants found around the home. Examples of homestead plants are lemons, oranges, bananas, pawpaw, pineapples and mangoes.

Questions:

1. What plants are important to us?
2. Why are they important?
3. What do we use maize for?
4. What do we use teak trees for?

Science Activity:

1. Go outside to observe and collect plants in the school compound and surrounding areas.
2. Sort the plants according to where they grow.
3. Talk about the characteristics of the plants.

3.2 Types of plants

There are different types of plants. Some have long stems like elephant grass. Others have short stems and grow near the ground. Grasses have long thin leaves. Shrubs grow one to two metres high and have many branches. Trees have one main stem with many branches high above the ground. Trees are usually tall.

Here are some different types of plants:



Grass



Tree



Shrub

Questions:

1. Give examples of these types of plants.
2. Why is grass useful to us?
3. Why are shrubs useful to us?

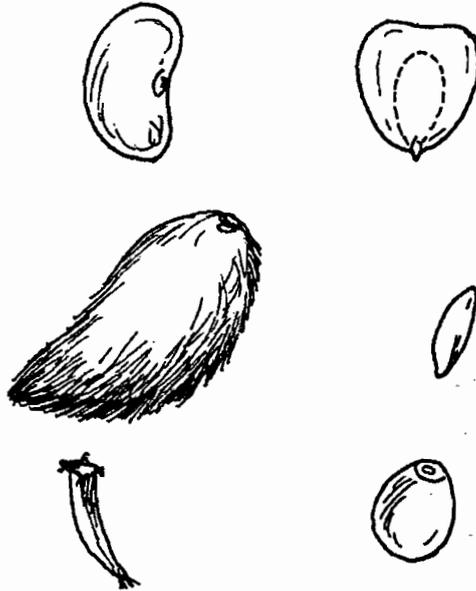
Exercise: *Choose the correct answer.*

1. What kind of plant do cows eat?
 - a. grass
 - b. shrub
 - c. tree
2. What kind of plant do mangoes grow on?
 - a. grass
 - b. shrub
 - c. tree
3. Where does cactus grow?
 - a. in the forest
 - b. in the desert
 - c. in the water
4. Where do we grow vegetables?
 - a. in the garden
 - b. in the forest
 - c. in the desert

3.3. Types of Seeds

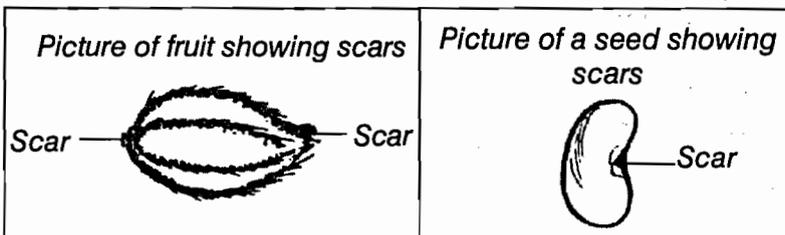
There are two types of seeds: monocotyledonous seeds and dicotyledonous seeds. Examples of each are maize and beans. Dicotyledonous seeds, such as beans, can be split in two and have two leaves when they sprout. Monocotyledonous seeds, such as maize, are in one piece and have only one leaf when they sprout.

What kind of seeds are these? Are they monocots or dicots?



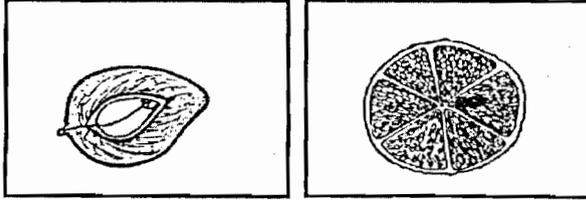
3.4 Differences between a Seed and a Fruit

Some examples of fruits are mango, orange, pawpaw, banana and guava. Seeds are beans, pigeon pea, sesame, groundnuts and cowpeas. The difference between a seed and a fruit is that a fruit has two scars and contains seeds while a seed has only one scar. Scars are places where the seeds or fruits were attached to other parts of the plant.



Science Activity:

Cut through a mango and an orange with a knife. What do you observe?



Fruits have seeds in them.

Questions:

1. What kinds of seeds do you eat?
2. What kinds of fruit have big seeds?
3. What is common to all seeds and fruits?

Science Activity:

1. Go outside and identify different seeds and fruit.
2. Draw diagrams of these seeds and fruit.

3.5 Uses of seeds

We use seeds for different purposes. Seeds such as beans, cowpeas and green grams are for eating. We cook groundnut seeds before eating them. We boil other kinds of seeds before eating them.

Some seeds are saved for planting and will give us new plants the following year. We eat some parts of plants. We grow seeds like beans and cowpeas and eat the leaves of vegetables. Seeds are also used for making things look beautiful. For example, beans are used for making beads that people wear.

Questions:

1. What are the different uses of seeds?
2. What are some seeds you use, and what do you use them for?

UNIT 4

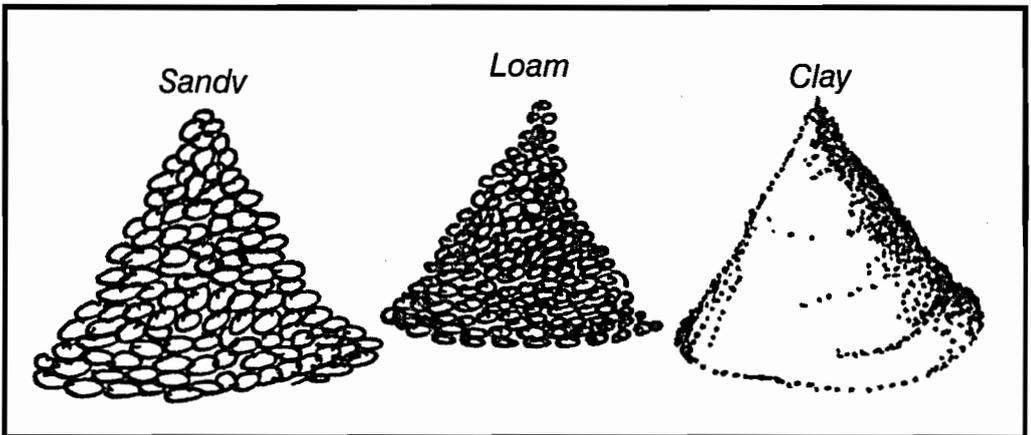
Soil

Soil is a thin layer on the earth's surface. Soil is made up of different things: stones, sand, fine soil, living and dead materials, water, and air.

4.1 Different Types of Soil

There are three types of soil:

- Soil made up of large particles is called sandy soil. Sandy soil is yellowish brown in colour. It is rough and does not hold water.
- Soil made up of medium sized particles is called loam soil. Loam soil is reddish brown in colour and holds some water. It's the best for farming because it's loose and contains organic matter.
- Soil made of tiny particles is called clay soil. Clay soil is smooth and fine to touch. It holds a lot of water but isn't good for farming.



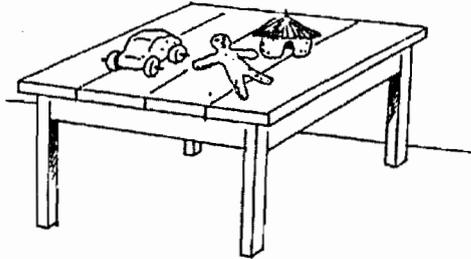
Questions:

- What are the three types of soil?
- Which type of soil is best for farming?
- What type of soil is around your school?

4.2 Uses of Soil

a) Modelling with clay

Clay soil is good for modeling. Try to roll some wet soil into a snake. If you can do this, you can use it to make other things such as pots.



Questions:

1. Do you ever model things with clay?
2. How do you make strong clay pots that will hold water?

b) Building Houses

Soil can be used to make houses in two ways. First, people make bricks from soil and water, and sometimes they add grass to the bricks. Secondly people make a wood frame and then plaster soil onto the frame. Soil and water mixed together is called "mud".

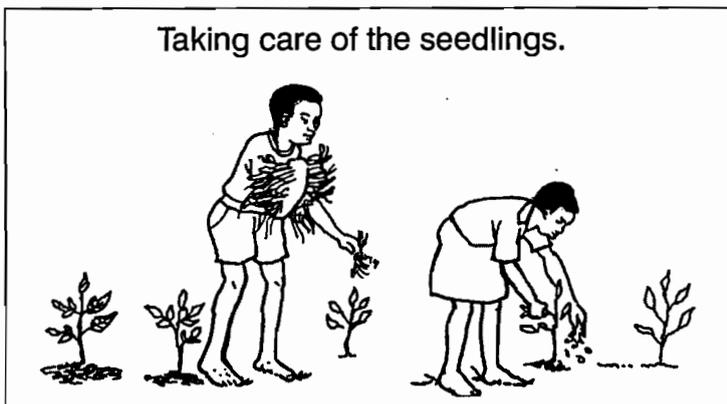
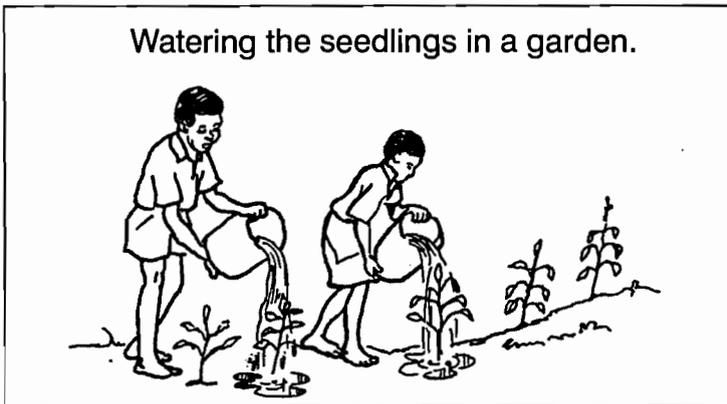
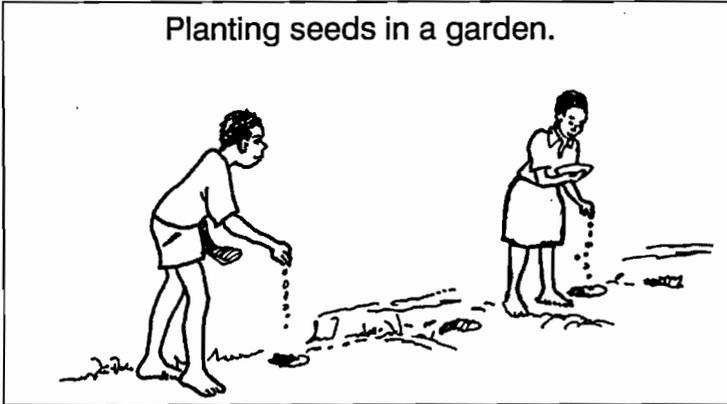


Questions:

1. Do you live in a brick house?
2. Is your house made of mud plaster?
3. What is "mud"?

c) Growing plants and trees

The most important use of soil for us is growing food. We plant vegetables, fruit trees and crops like maize and sorghum in soil. It's important to take care of plants by watering them often and keeping the soil loose.



Questions:

1. Do you have a garden?
2. What plants do you grow?
3. What trees do you grow?

Exercise: Put one of the words in each sentence.

sand clay mud grass loam

1. The best soil for growing things is _____.
2. We use _____ to make pots.
3. There is a lot of _____ in the desert.
4. Water and soil mixed together is called _____.
5. Sometimes people put _____ in bricks.

4.3 Things Found in the Soil (the composition of soil)

Soil contains many things such as insects, dead plants and animal remains. Examples of things found in soil are shown in the following pictures.



Small seeds



Dead insects



Ants



Earthworms



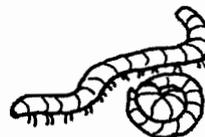
Gravel and small stones



Leaves



Roots



Millipedes

Science Activity 1:

1. Go outside and get some samples of soil.
2. Examine the soil and try to find the things in the picture.

Science Activity 2:

1. Make a box with wire mesh or a tin with small holes in the bottom.
2. Get a handful of garden soil and sieve the soil to get different sized particles.
3. Put the different sized particles in plastic bags that have holes in the bottom. Pour a cup of water through each bag. Collect the water that flows through and see which one flows faster.
4. Try to explain what you see.

Questions:

1. Name the soil with fine particles (sandy/loam/clay)
2. Which type of soil is good for making bricks? (sandy/loam/clay)
3. Which soil is good for growing plants? (sandy/loam/clay)
4. Which soil allows water to pass very fast and which allows water to pass very slowly (from results of activity 2)?

UNIT 5

Weather

5.1 Changes in the weather

We feel changes around us throughout the year. We may feel cold, hot, dry or wet. We notice these changes in our bodies when there is sun, rain or wind.

We use these words to describe weather: sunny, windy, rainy, hot, cold, cool and warm. On hot days we wear light clothes and on cold days we wear heavy clothes.

1. Hot weather



The boy is sweating.

2. A cold day



The girl is wearing heavy clothes.

3. Windy weather bending and damaging plants.

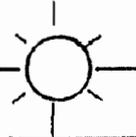


Questions:

1. How do you feel when it is sunny?
2. How do you feel when it is rainy?
3. What kind of weather do you like the most?

5.2 Reading Simple Charts

A weather chart shows weather conditions. Look at this weather chart

				
Hot	Windy	Cloudy	Rainy	Sunny
Day 1	Day 2	Day 3	Day 4	Day 5

How was the weather each day?

Exercise: Draw pictures to show

--	--	--	--

A Sunny Day A Windy Day A Rainy Day A Cold Day

Exercise: Choose one word for each sentence. Answers may be different on some sentences.

sunny rainy cold windy

1. We can't play football on a _____ day.
2. We wear heavy clothes on a _____ day.
3. We need an umbrella on a _____ day.
4. We don't need heavy clothes on a _____ day.
5. I feel happy on a _____ day.
6. Things can blow away on a _____ day.

5.3 Observing things during weather changes

a) Observing Trees

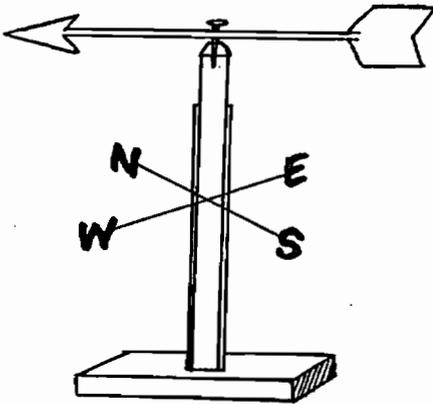


Exercise: Compare pictures 1 and 2 and fill in these sentences.

1. The _____ is bending the trees.
2. The _____ on the man's head blew away.
3. The _____ on the line are blowing.

b) Observing a Wind Vane

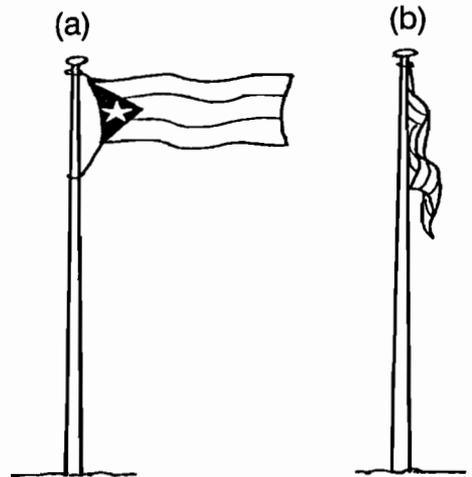
A wind vane points in the direction from which the wind is blowing. A wind vane consists of an arrowhead and a tail which are usually made of light tin so that it can be moved by the wind easily. It is placed on a heavy stand so that it doesn't fall over.



Wind vanes should be placed where wind blows freely such as on high open ground or on top of a building where there is nothing to stop the wind movement.

c) Observing Flags

Look at the pictures of the flags. In which picture is the wind blowing hard? Look at the second flag. What is the weather like in picture (b)?



Questions:

1. Where is there a wind vane in your area?
2. Who uses wind vanes?

d) Observing Clouds

When it is calm the clouds in the sky are almost still or moving very slowly. When it is windy they move in the direction that the wind is blowing. When it is about to rain, the clouds get bigger and darker. After the rain has fallen the big clouds disappear.

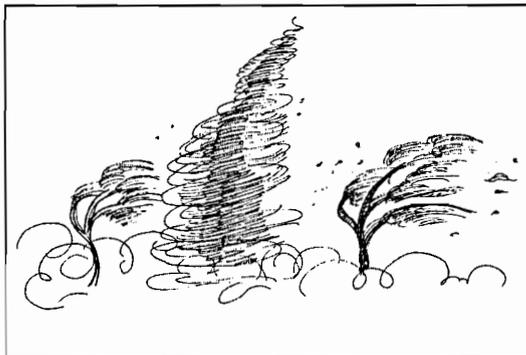


Questions:

1. How do clouds move on a calm day?
2. How do clouds move on a windy day?
3. How do rain clouds look?

A Windy day

On a windy day dust fills the air. You can see the direction of the wind. Sometimes the wind spins around taking up dust and pieces of paper. This is called an eddy.



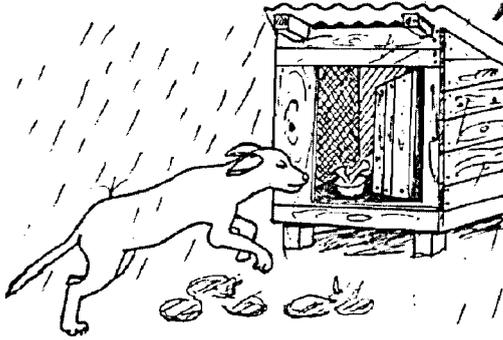
Questions:

1. During what months is there a lot of dust?
2. Have you ever seen an eddy? Where?

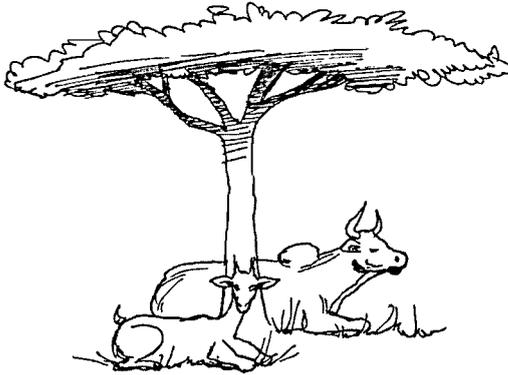
5.4 Human and animal activities in different weather conditions

When it is raining, cats and dogs run to their houses. When it gets cold and the sun is setting, chickens run home. When it gets dark, weaver birds go into their nests.

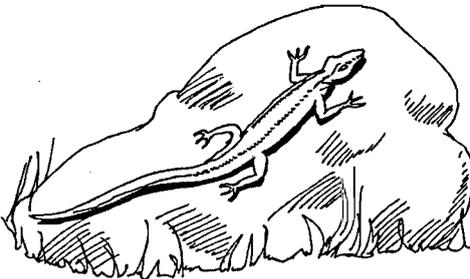
Why is the dog running into its house?



Hot weather: A cow and a goat in the shade of a tree



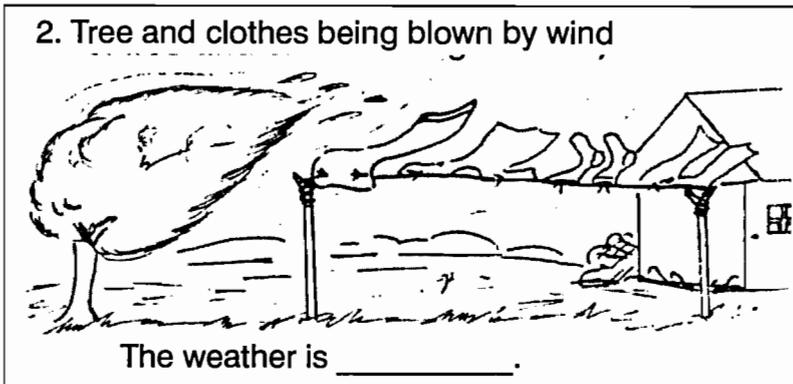
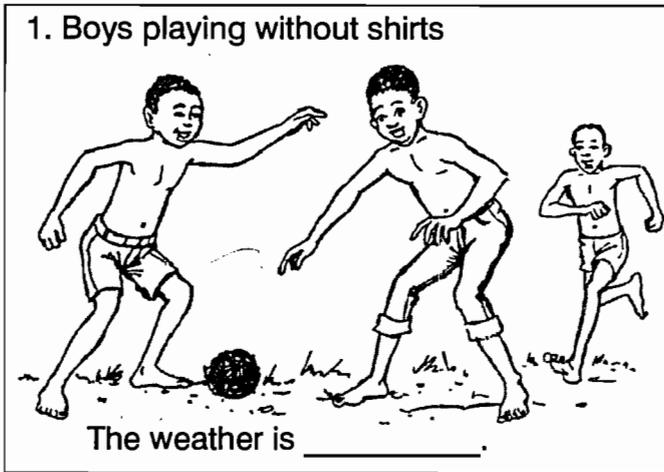
When it is sunny, lizards lie on rocks to get warm.



Questions:

1. Which animals like rain?
2. Which animals don't like rain?
3. What do humans do when it starts to rain?
4. What kind of weather do you like most?

Look at these picture. What do you see?

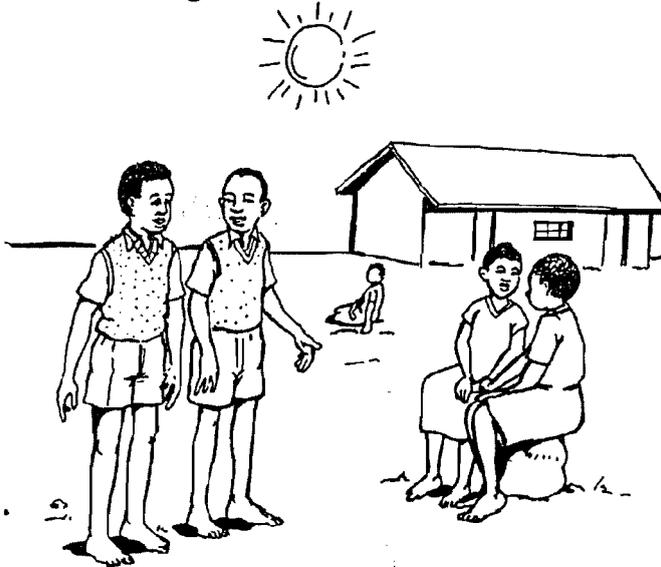


3. A girl and a boy with umbrellas



The weather is _____.

4. Children sitting near the school

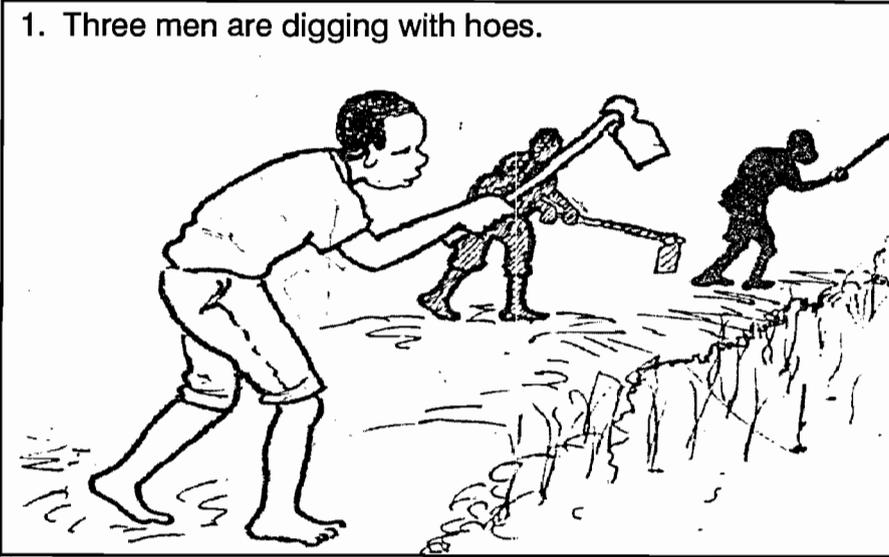


The weather is _____.

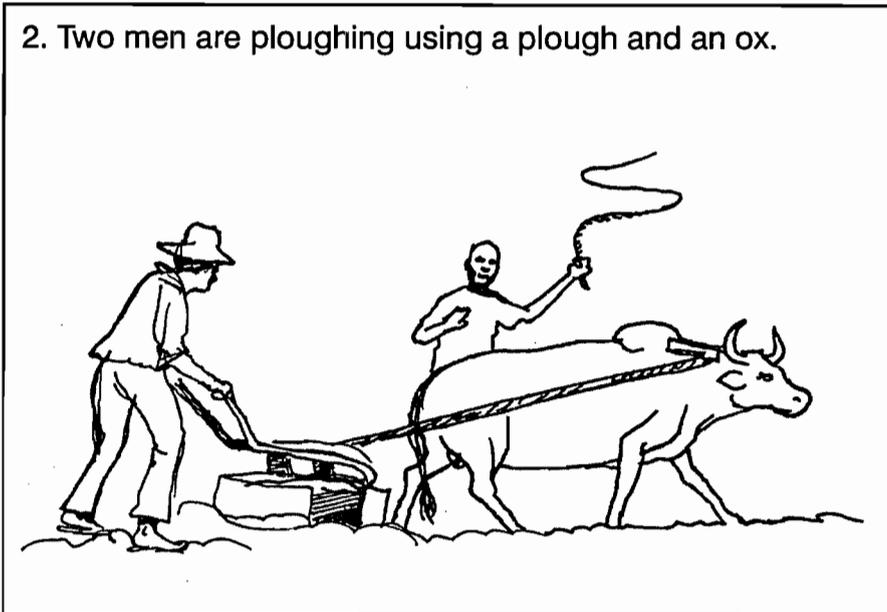
Exercise:

Look at the five pictures below. They are pictures of people making farms and harvesting crops. Explain what kind of weather people like to have with each activity.

1. Three men are digging with hoes.



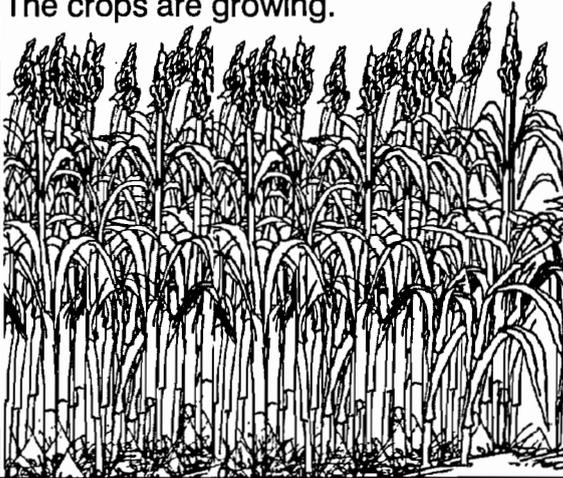
2. Two men are ploughing using a plough and an ox.



3. Two women are planting seeds on a farm.



4. The crops are growing.



5. The people are harvesting crops.



Exercise: Choose the correct word.

1. We harvest crops when it is _____.
 - a. raining
 - b. sunny
 - c. wet

2. Crops need _____ to grow.
 - a. rain
 - b. wind
 - c. cold weather

3. When it is very sunny people and animals sit in the _____.
 - a. tree
 - b. rocks
 - c. shade

4. We can use an ox to _____ fields.
 - a. harvest
 - b. plough
 - c. hoe

5.5 Identification of the direction of the wind

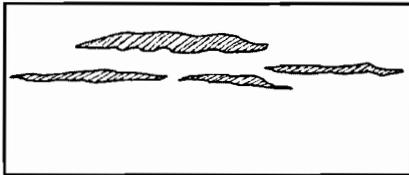
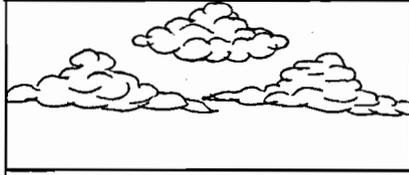
We can identify the direction of the wind by observing the following:
Trees and branches bend in the direction the wind is blowing.
Smoke and dust also move with the wind.



Questions:

1. When does the wind blow strongly?
2. In what areas are there dust storms?

5.6 Identification of Different Types of Clouds

	High clouds
	Clouds in fair weather
	Rain Clouds
	Rain

- a) Low Clouds and high Clouds: Low clouds are usually near the ground and form a thin fog while high clouds look like cotton.
- b) Clouds associated with weather: Fair weather clouds are white and look like cotton while rain clouds are dark.

Activities:

1. Draw the type of clouds you see on a:
 1. Sunny day
 2. Windy day
 3. Rainy day
2. Go outside and find the direction fo the wind. What can you look at that will show you the direction of the wind?

UNIT 6

Air

6.1 The importance of Air

We cannot see the air, but we feel it when it moves around us and see it move other things such as trees and pieces of paper.

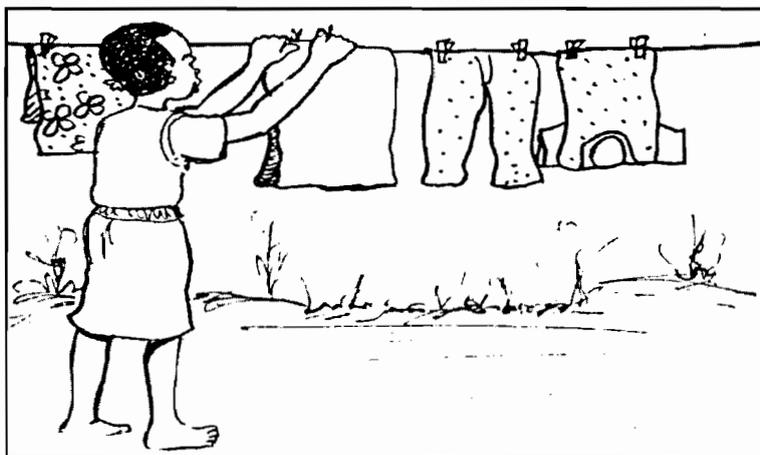
Air is important to us in many ways.

a) Breathing:

Air contains oxygen which all animals need to live. If animals don't have oxygen they will die. Therefore, air is one of the most important things for animals. Fish breathe oxygen from the water. They use gills to breathe, not lungs. Air also contains carbon dioxide which plants breathe. Plants also need air to live.

b) Drying clothes

After washing clothes we dry them in the air. We hang wet clothes in the air and the water evaporates into the air, so the clothes become dry.



c) Winnowing grain

Wind can blow dirt from seeds such as sorghum, sesame, millet, ground-nuts and maize. To prepare grain to eat we winnow it. We throw it into the air and the wind carries away the light part, while the heavier grain falls to the ground.



Questions:

1. What do animals breathe?
2. What do plants breathe?
3. What do fish breathe?
4. Explain how to winnow grain.

6.2 What is Wind?

Moving air is called wind. Wind can move things from one place to another.

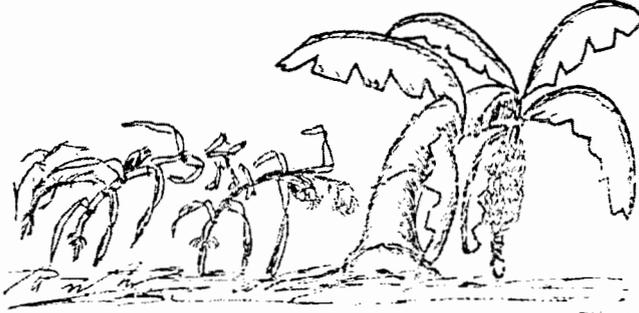
Exercise: Write the correct word in the blank.

1. Air helps us to _____ clothes.
2. Wind helps us to _____ grain.
3. Animals live because air has _____.
4. If animals have no air they will _____.
5. Fish use _____ to breathe.
6. Humans and other animals use _____ to breathe.

6.3 Bad effects of Wind

Strong wind can bend and break plants. A strong wind can damage things. It can damage houses and trees and other buildings. It can cause waves on water. Wind can blow things away and blow sand in your eyes.

1. Maize and banana crops.



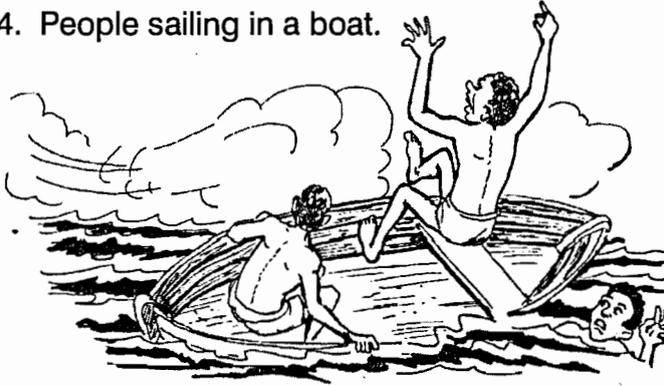
2. Trees



3. Children outside the house on a windy day.



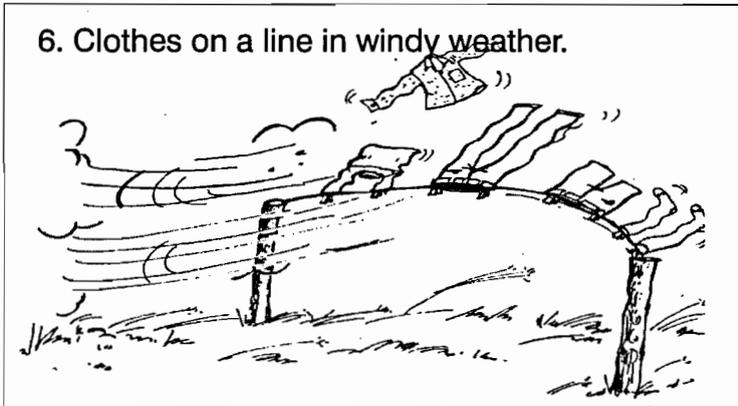
4. People sailing in a boat.



5. A house being damaged by the wind.



6. Clothes on a line in windy weather.

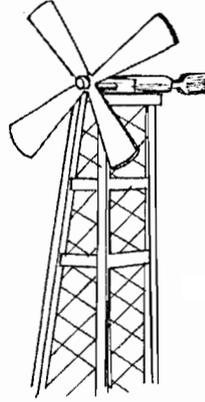


Question:

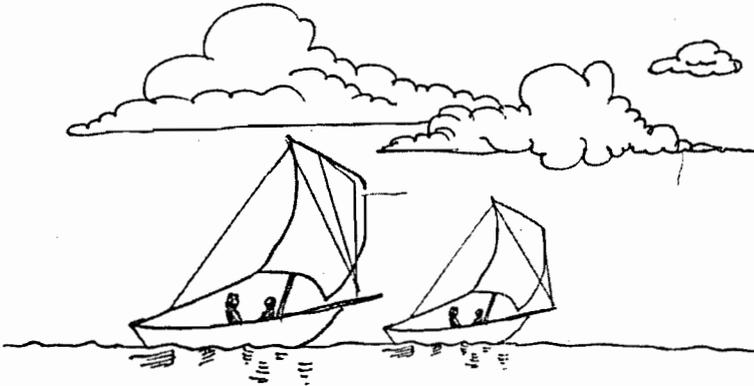
1. Tell your experiences of the bad effects of wind.
2. What do you do when the wind is very strong?

6.4 Air Makes Things Move

a) Moving air can turn a windmill.



b) Air can move boats with sails.



c) Moving air can make parachutes move.



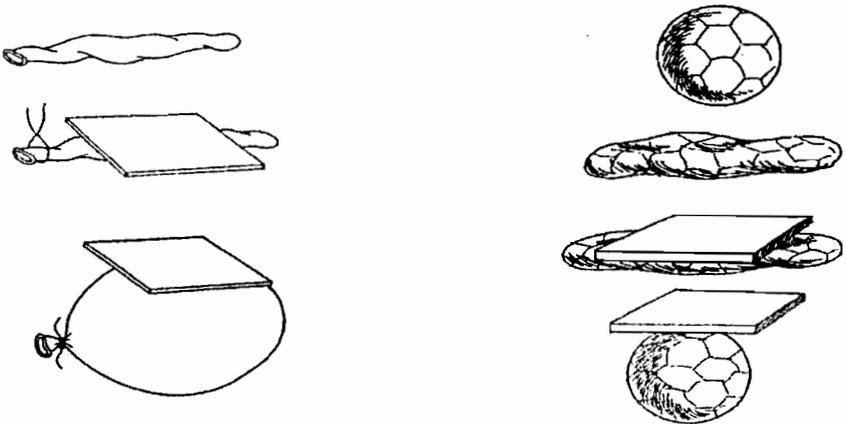
Questions:

- 1. What are five things that the air can move?
- 2. Have you ever lost anything because the wind blew it away?

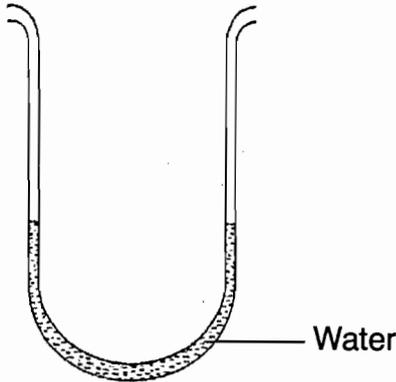
6.5 Air Pressure

Air exerts pressure. Pressure is a force, like pushing your hand against something, but air is invisible so you can't see it. Look at the following examples.

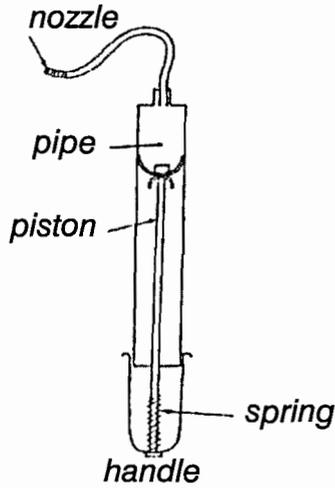
- A. If you place a book on a balloon or ball that has no air in it, then blow up the balloon or ball, you can see the book go up from the air pressure.



- B. If you blow in one end of the tube, the air pressure will push the water out the other end.

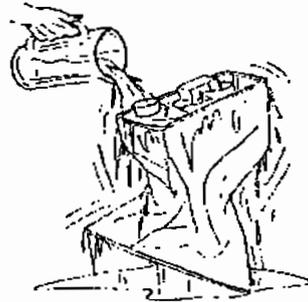
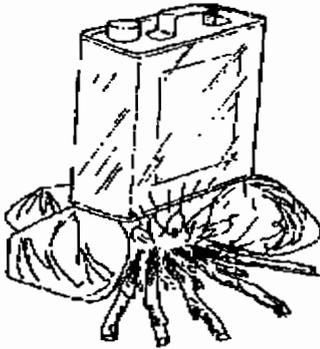


C. A bicycle pump blows out air when you push on the piston.



D. Collapsing can

Put a can full of air on a fire. The fire will burn up the air and the can will collapse because there is no air pressure inside.



UNIT 7

Light

Light comes from any source and enables us to see that source. Our eyes receive the light from objects that we see.

7.1 Observing Images in a Mirror

The picture in a mirror is called an image. The image can be of yourself or of any object that you hold in front of the mirror. We say that the mirror reflects the image.

Get a mirror and hold it in front of your face. What can you see in the mirror?

- The picture in the mirror is called an image.
- The face which you see in the mirror is an image of your face.

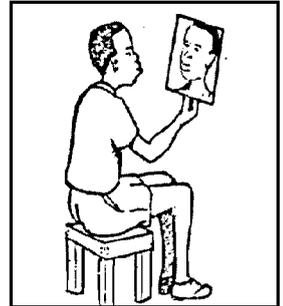
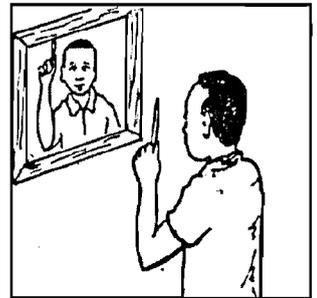


Image in a mirror

Science Activity:

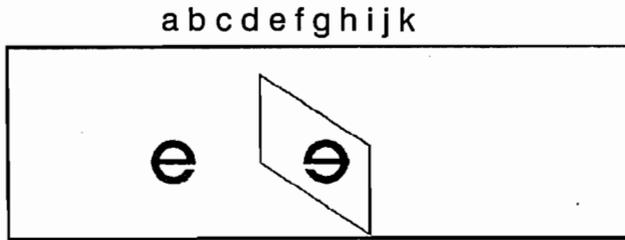
1. Place a mirror on a table. Hold it upright. Ask your friend to hold a pencil behind you. Lift up the mirror. Can you see the pencil? Find out where you have to hold the mirror to see the pencil behind you.
2. Hold the mirror in front of your face and hold your left ear. Look at the mirror. Which ear is being held by your hand?
3. Point at your right eye and look at the mirror. Which eye is the finger pointing at? When you hold something in your left hand, in the mirror it appears on the right.
4. Hold the mirror in front of your face. Make different faces like being happy, angry, sad, surprised, etc. Look at the images in the mirror. What are they like?



Images in the mirror

Now we are going to do more experiments with mirrors.

1. Hold the mirror in front of you. Write the letters of the alphabet on pieces of paper.



Hold each letter in front of the mirror. How is it reflected in the mirror?

Write the letters as you see them in the mirror.

2. Next, write larger capital letters on a piece of paper.

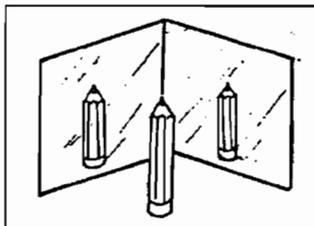
A B C D E F G H I J K L M N O P

Hold them in front of a mirror. Write how each letter is reflected in the mirror.



3. Write the numbers 1 2 3 4 5 6 7 8 9 0 on paper. Hold each number in front of a mirror. Write what each number looks like.

4. Take two mirrors and place them at an angle as shown in the picture below. Place a pencil in front of them. How many images are reflected?



Questions:

1. What letters are the same as their images?
2. Write how these letters and numbers appear in the mirror:

B F B N T P X Z 1 0 4 8 9

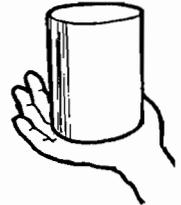
7.2 Looking at images formed on other surfaces

Images are reflected in mirrors but can also be reflected on other things.

Can you see images in water? Look into a basin of water, then hold different objects above the water. Observe the images reflected. Do these images look like the objects?



Collect objects with silvery surfaces such as tins, spoons or a piece of iron sheet. Hold objects in front of these smooth surfaces. What do you see? Do the images look like the objects? Are the images reflected on the silvery surfaces the same as those formed in clear water?



Questions:

1. What kind of surface reflects the clearest image?
2. What surfaces reflect an image that is not clear?

Exercise: Choose the correct word.

1. A _____ reflects a clear image.
 - a. spoon
 - b. mirror
 - c. book

2. A _____ can also reflect an image, but it's not clear.
 - a. spoon
 - b. mirror
 - c. book

3. A _____ cannot reflect an image.
 - a. spoon
 - b. mirror
 - c. book

4. The letter H looks _____ in a mirror.
 - a. the same
 - b. different

5. The letter S looks _____ in a mirror.
 - a. the same
 - b. different

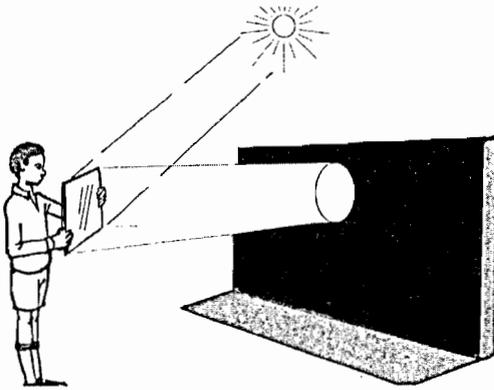
7.3 Observing the Direction of The Sun's Beams

Stand outside in the sun and observe the direction of the sun's light. Do this in the morning, at midday and in the evening. What do you see? Do you see bright light? This light is the sun's rays, or beams. The sun gives us light. This is why we have light during the day.

What else does the sun's light give us? It gives us heat. This is why, when the sun's rays are strong, we feel hot.

Science Activity:

Take a mirror and go outside. Use it to reflect light on a wall as shown in the picture.



You should be careful not to reflect the light into the eyes of a friend. Repeat this with other smooth shining surfaces such as a spoon, a saucepan and a piece of iron sheet, and then try it with other objects such as books, pens, and stones.

Record the objects that reflect light on the wall and those that don't in the table below.

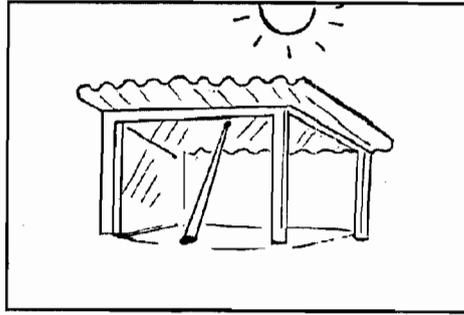
Objects that reflect light	Objects that do not reflect
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

What kind of surfaces produce the best reflections?

7.4 Observing the direction of the sun's light

Science Activity:

Find a building that has a small hole in the roof as in the picture. Look for the sun's beam on the floor and mark its location. What happens to the spot of light after one hour. Mark the spot of light on the ground. After another hour look at the spot of light. Has it moved?

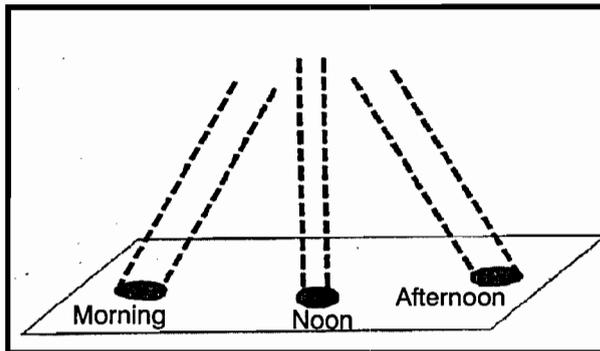


In the morning after sunrise check for the spot of light. At break time check for the spot of light and then again at lunch time, in the afternoon and in the evening. The direction of the beam of light from the sun changes as time goes by.

When the sun is in the east, where is the beam?

Where is the beam at noon?

Which direction does it move in the afternoon?



Exercises:

1. Name four sources of light.
2. Light reflected from a _____ can be pointed in different directions.
3. A _____ of light from the sun changes its position from morning to evening.
4. If the sun is in the east the spot of light through a hole on the roof will appear in the _____ (east, west, north)

7.5 Uses of Light

Light is one of the most common forms of energy around us. All burning objects emit light. The sun is the biggest source of light for the earth. It gives us light from sunrise to sunset.

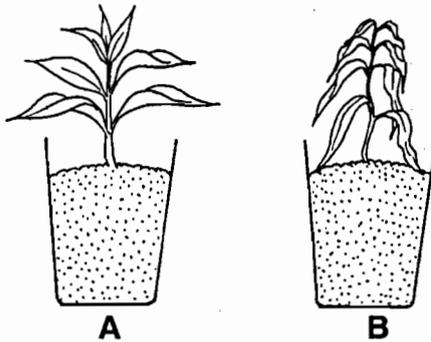
At night when there is no lamp, moonlight or electricity are you able to see clearly? When it is completely dark, you cannot see. Light enables us to see.

Experiment:

Do plants grow better in the dark or in the light?

Take two bean or maize plants growing in good soil in plastic containers.

Give each plant some water. Then cover plant B with a box or other container. Leave the two plants for 10 days. Uncover plant B. What is its colour? Is the plant weak or strong?



Compare plants A and B. Which one is growing well and is healthy?

What can you say about the results of this experiment?

7.6 How does light travel?

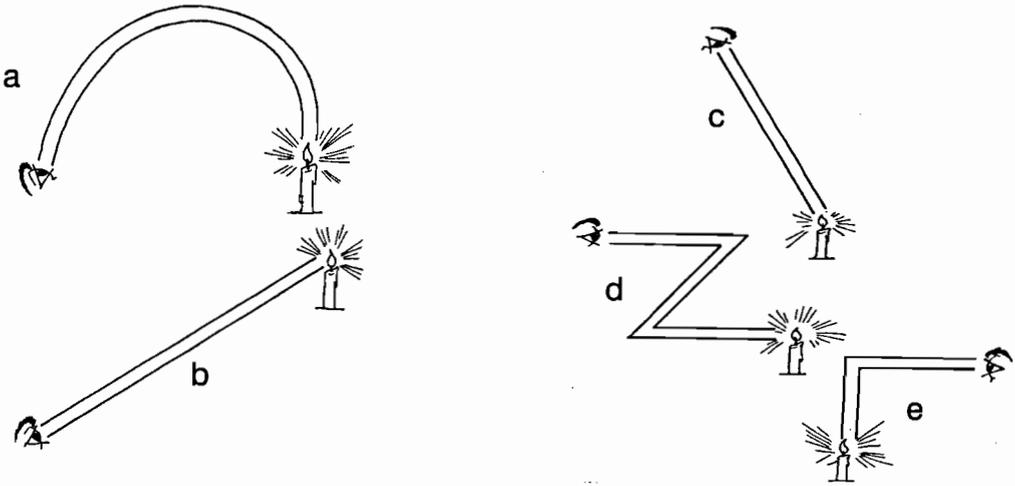
Science Activity:

Do the following activities to find out how light travels.

Get two pipes, one which is curved, and another which is straight. Place a burning candle at one end of each pipe. Look through the other end of the pipes. In which pipe can you see light from the burning candle?

Do you think light travels in a straight line or in a curved line?

In which of the pipes in the pictures can light travel through and be seen at the other end?



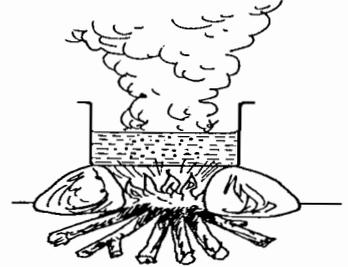
Exercise:

1. The earth receives most of its light from the _____.
2. At night we get light from lamps, fire, electricity, the _____ and the _____.
3. All shiny objects can _____ light.
4. Images can be reflected if objects are placed in front of _____ objects.
5. Light enables people and _____ to see.
6. Plants need light to make their own _____.
7. Light cannot travel through a metal pipe that is _____.

UNIT 8

Heat

When sitting near a fire we feel warm. The heat comes from the fire. Heat is another form of energy.

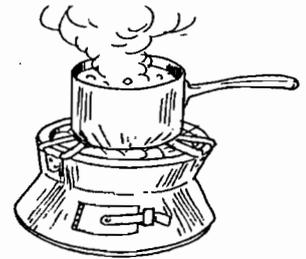


8.1 Sources of Heat

There are various sources of heat including the following:

a) Firewood

Many people use firewood for cooking at home. They also use firewood for heating water to take a bath, and to boil water for drinking.



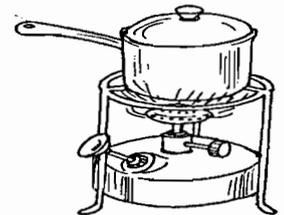
b) Charcoal

Some people use charcoal in a stove (kanuun) for cooking and heating water.

If possible, visit a charcoal maker and see how it is made.

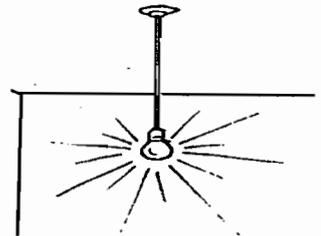
c) Kerosene (paraffin)

Some people use kerosene in a kerosene stove as a source of heat for cooking.



d) Electricity

Electricity is a form of energy that can also produce heat. Electric bulbs may get too hot to touch if they burn for a long time.

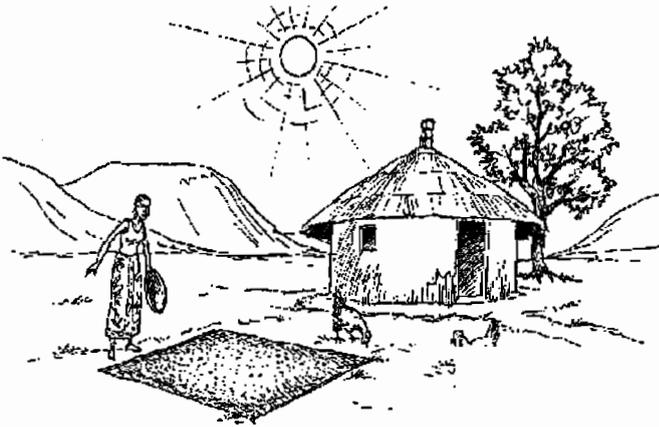
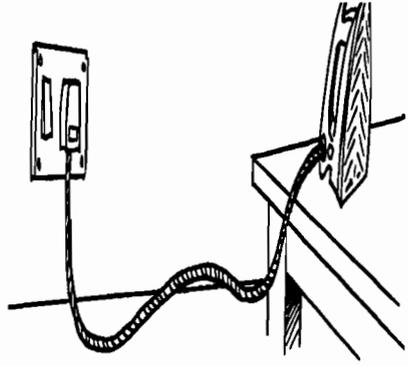


Electric irons, which are used for ironing clothes, use electricity as their source of heat. Some types of irons use charcoal.

e) The Sun

The sun is the main source of heat energy on earth. It give us heat from sunrise to sunset. In the morning we sit outside to warm ourselves, but at midday the heat from the sun may be too strong so we want to stay inside.

When we put grain outside to dry, it gets get heat from the sun.



Questions:

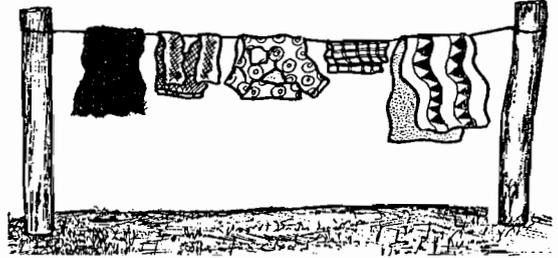
1. What do you use in your home for heat?
2. What do you use to iron your clothes?
3. What do you use for heat to cook?

8.2 Uses of Heat

Can you name some of the ways that we use heat at home?

Think of the ways listed here. How many of them have you used?

- a) For cooking food
- b) For warming ourselves
- c) For heating water
- d) For drying grain
- e) For drying clothes



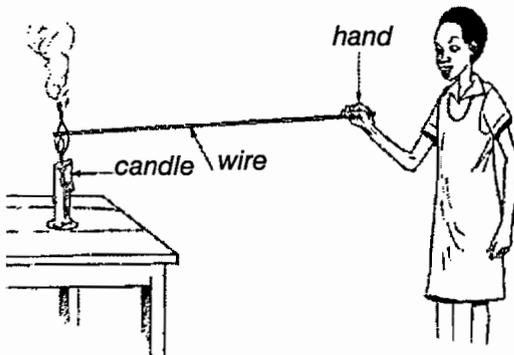
8.3 Transfer of heat

Heat can move through solid things, through water, and through air. We know that heat moves through air because, when we sit by a fire, the heat comes to us.

Transfer of heat through solids by conduction

Science Activity:

Light a candle. Hold a piece of wire at one end and place the other end over the flame of the candle. What do you feel?



Conduction is the flow of heat through a solid. The solid must be a metal like copper wire or a steel rod.

Questions:

1. What can heat travel through?
2. How do you know that heat can travel through the air?
3. How do you know that heat can travel through water?
4. How do you know that heat can travel through a solid?

Exercise: *Choose the word or phrase that doesn't fit with the other three.*

1. firewood charcoal water kerosene

2. cook food grow crops dry clothes dry grain

3. the moon the sun electricity fire

UNIT 9

Earth and Space

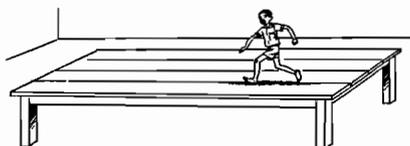
9.1 The Earth is Round

The earth is a planet. There are 8 other planets. Some are smaller than our earth. Others are bigger than the earth. All the planets go around the sun.

The names of the planets, starting nearest the sun are:

- Mercury
- Venus
- Earth
- Mars
- Jupiter
- Saturn
- Uranus
- Neptune
- Pluto

The earth is not flat like a table but round. If you start moving towards the west on a long flat table you will come to the edge of the table and fall off. But on the earth, if you start moving towards the west you will go on and on until you come back to where you started because the earth is round.



Hold a ball or an orange in your hands. The earth is like a very big ball or orange. Move your finger around the ball or orange and see how you come back to the beginning.



Questions:

1. What shape is the earth?
2. What planets are near earth?

9.2 Gravitational Force

Gravity is a force that pulls things to the ground. It pulls things that are thrown up downward. Gravity cannot be seen or felt. We can only see what it does to things.

Look at the trees around the school or near your home. What happens to the leaves and fruit when they fall off? Do they remain up on the tree?

Look at the bottom of the tree and the area around it. What do you see there? These things are pulled to the ground by the force of gravity. They also remain on the ground from the force of gravity.



Science Activity:

Two learners drop objects at the same time from different heights. Which object reaches the ground first?

Throw objects up into the air and see how long it takes them to return to the ground. Who can throw an object the highest?

Exercise: Choose the correct word or phrase.

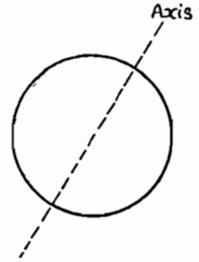
1. If you throw a book in the air it will go _____.
 - a. up then down
 - b. down then up
 - c. up only
2. The book goes up because of _____.
 - a. the wind
 - b. gravity
 - c. the force of throwing
3. The book comes down because of _____.
 - a. the wind
 - b. gravity
 - c. the force of throwing

9.3 Causes of Day and Night

Day and night are caused when the earth rotates as it moves around the sun. The spinning movement of the earth is called the rotation of the earth. The earth rotates once on its axis every 24 hours. This rotation of the earth causes day and night. When one-half of the earth is in the sun, this half has day. The part of the earth facing away from the sun is in a shadow. The sunlight cannot reach this part, and this part has night. It is in darkness.

Science Activity:

Bring a round object, such as an orange, and a torch to class. Try to use the orange and the torch to see how, as the earth rotates, it's day and night in different areas.



9.4 Revolution of The Earth

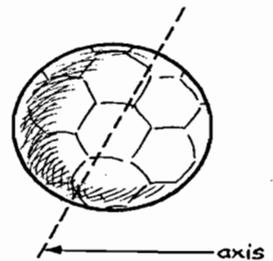
What causes the seasons?

In countries away from the equator there are four seasons per year. These are:

1. Summer, when it is very hot.
2. Autumn, when it starts getting cold and leaves from trees turn yellow and fall off.
3. Winter, when it is very cold. Trees have no leaves and many animals hibernate underground. Sometimes snow falls on the ground.
4. Spring, when it starts getting warm and plants develop new leaves and flowers. Animals which were hibernating reappear.

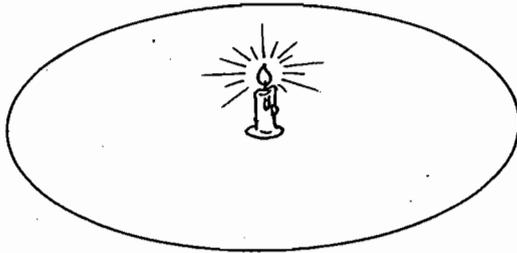
In our country and many others which are near the equator, the four seasons are not so distinct. Winter in Sudan is not cold and snow never falls.

The revolution of the earth causes seasons. The earth tilts on its axis and the part of the earth that is nearer the sun has hotter weather. This is why countries near the equator are always hot and why countries away from the equator are either hot or cold depending on the position of the earth on its axis.



Science Activity:

Get a candle to represent the sun and a ball or globe to represent the earth. Place the lit candle on the ground. Draw a large oval around the candle. The oval represents the orbit of the earth. Rotate the ball and move it along the orbit with the candle in the centre.



Make sure the ball is tilted in the same direction all the time like the earth tilts on its axis. Observe the parts of the ball that are nearer the candle. Where is the weather hot? Where is the weather cold?

Exercise:

1. It is day time when our area is _____ the sun.
 - a. facing
 - b. away from
2. It is night when our area is _____ the sun.
 - a. facing
 - b. away from
3. The earth revolves around the sun _____.
 - a. once a day
 - b. once a year
4. The earth revolves on its axis _____.
 - a. once a day
 - b. once a year
5. It doesn't get very cold in countries that are _____.
 - a. near the equator
 - b. far from the equator
6. It gets cold in countries that are _____.
 - a. near the equator
 - b. far from the equator
7. New Sudan is _____.
 - a. near the equator
 - b. far from the equator
8. There are seasons far from the equator because _____.
 - a. the earth revolves on its axis
 - b. the earth tilts on its axis

UNIT 10

Making Work Easier

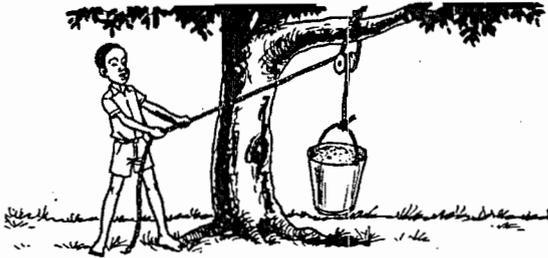
Simple Machines

People work hard on their farms and on their jobs. We can make work easier by using simple machines. Some examples of simple machines are

- the pulley
- the wheel
- the incline plane
- the lever
- the winch

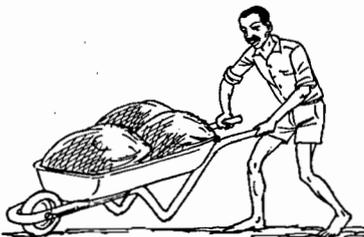
A Simple Pulley

You can use a pulley to draw water from a well or to lift a heavy object. To make your own simple pulley you need a cotton reel, string, wire, nails, and some tools. Hang your pulley from the branch of a tree and use it to lift things. Look at this picture of a simple pulley:

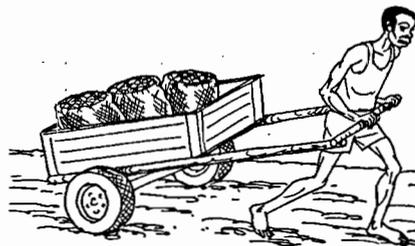


The Wheel

The wheel is the most important simple machine we have. People use wheels every day on their bicycles and cars. In these pictures you can see people using a wheelbarrow and a handcart. A wheelbarrow has only one wheel, but a handcart has two.



A wheelbarrow



A handcart

The Incline Plane

Incline planes are long boards or other long objects that move from a lower position to a higher position. They help us move objects or to climb to higher level. A ladder is an example of an incline plane. It makes climbing easier.



A Ladder

The Lever

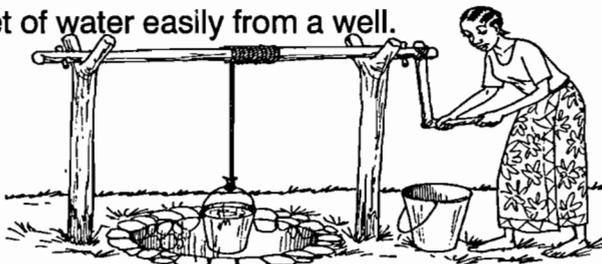
Levers can be big or small. A lever is a board placed on a rock or other object. We push on one end and it lifts the other end easily. We use levers to move objects and in electrical systems.



A lever

The Winch

Fetching water from deep wells is very difficult work, but this work can be made easier by using a simple machine called a winch. The winch enables us to pull a bucket of water easily from a well.



A winch

Questions:

1. What are some things that have one wheel?
2. What are some things that have two wheels?
3. What are some things that have four wheels?
4. Do you use a simple machine when drawing water from your well?
5. Where are some simple machines in your area?

Exercise: *Which machines can help you do each kind of work? There may be more than one kind of machine that you can use for each kind of work.*

a pulley

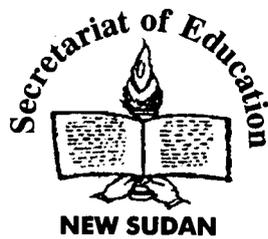
a wheel

an incline plane

a lever

a winch

1. A person climbing to the top of a tree.
2. Moving something to another house.
3. Drawing water from a well.
4. Lifting an object up one meter.
5. Lifting an object up ten meters.
6. Carrying soil to make bricks.



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