Topical outlines

THEME 1: OUR ENVIRONMENT IN OUR SUB COUNTY

Sub theme: Soil

- Components of our environment
- Living things
- Non- living things
- Soil
- Components of soil
- Air as component of soil
- water
- Water is got from
- Uses of water in the soil
- mineral salts
- Weathering
- Formation of soil
- Decomposition
- Types of soil
- Characteristics of loam soil
- Characteristics of sand soil
- Characteristics of clay soil
- Soil profile
- Soil erosion
- Agents of erosion
- Causes of soil erosion
- Ways of controlling soil erosion
- Mulching
- Crop rotation
- Trees that provide timber
- soil exhaustion
- Causes of soil exhaustion
- How to control soil exhaustion
- Soil conservation
- How to conserve the soil

THEME 2: NATURAL CHANGES IN THE ENVIRONMENT

- Changes in the environment
- Natural changes which occurs in plants
- Natural changes in animals
- Effects/dangers of natural changes
- Ways of managing these changes
- People – made changes
- Examples of man made changes
- Good effects of man made changes
- Ways of managing changes:

THEME III: ENVIRONMENT AND WEATHER IN OUR SUB-COUNTY

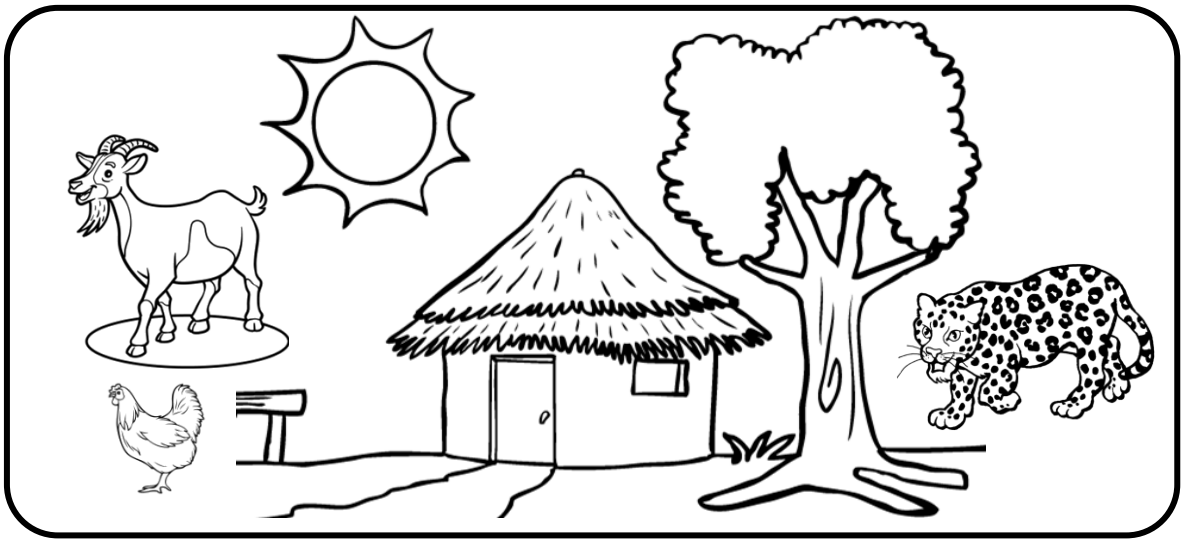
- Weather
- Air
- Properties of air
- Experiment to show that air occupies space
- An experiment to show that air expands when heated
- Types of wind
- Aspects of wind
- Rusting
- the sun
- Uses of the sun
- Shadows and opaque objects
- Water
- Advantages of water to people
- Changes in water
- Harvesting water
- How water sources get contaminated
- Rain
- Effects of rainfall
- Measurement of rainfall
- Types of clouds
- Effects of clouds

THEME 1: OUR ENVIRONMENT IN OUR SUB COUNTY

ENVIRONMENT

Environment is the man and his surroundings.
These are things that surround us.

Components of our environment



Components of environment are things which make up our surroundings.

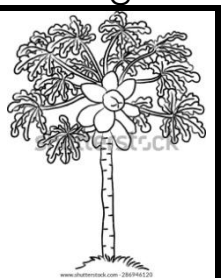
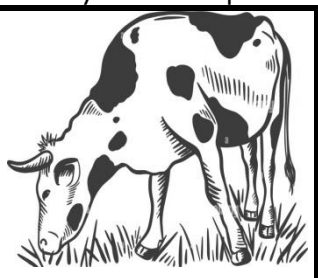
- ✍ Land/soil
- ✍ Air
- ✍ Animals
- ✍ Water
- ✍ Plants

These components of environment are classified in to two groups:

a) Living things
b) Non living things

Living things

Living things are things that carryout life processes

				
Birds	Plant	animal	insect	People

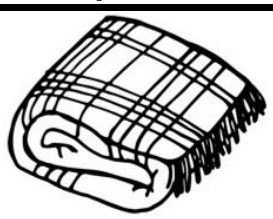
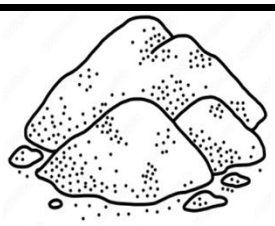
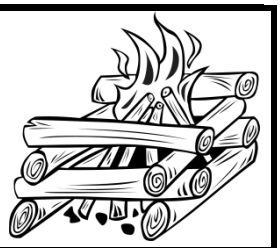
Characteristics of living things

1. They feed
2. They reproduce
3. They move
4. They respire
5. They grow
6. They respond to stimulus

Non- living things

Non -living things are things which do not carry out life processes.
Some non- living things are natural and others are artificial or manmade

Examples of non living things

				
clothes	road	bag	soil	fire

Characteristics of non living things

- They do not feed
- They do not reproduce
- They do not respond to stimulus
- They do not move
- They do not grow

Activity

1. Explain the word environment.
   _____
   _____
2. Give any **two** living components of the environment.
   (i)_____
   (ii)_____
3. What is the main difference between living and non living things?
   _____
   _____
4. Give **two** characteristics of things which do not carry out life's processes.
   (i)_____
   (ii)_____
5. Name any **two** natural non living things.
   (i)_____
   (ii)_____
6. What are artificial non living things?
   _____
   _____
7. Draw and name any **three** non living things created by people.

8. State any **two** characteristics of non living things.
   (i)_____
   (ii)_____

Soil

Soil is the top layer that covers the earth's surface.

Soil is composed of many things.

Components of soil

1. Air
2. Water
3. Mineral salts
4. Rock particles
5. Humus (organic matter)
6. Living organisms

Experiment to show that soil contains humus

Requirements

- ✓ Sample of soil
- ✓ Beaker/jug
- ✓ Water

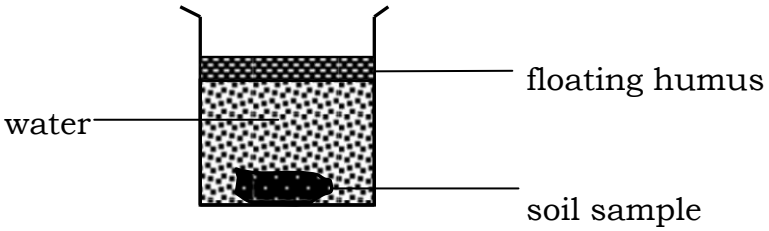
Procedure

- Get a transparent jug with water.
- Put soil in the water and stir
- Leave it to settle.

Observation

Black substances float on top of water.

Humus will settle on top surface of water.



Humus is formed when plants and animals die and decay.

Importance of humus

1. It adds fertility to the soil (it makes the soil fertile).
2. It holds the soil particles together.
3. It keeps the soil water for a long time.
4. It determines the colour of the soil

Activity

1. What is soil?

   _____

   _____

2. Identify any **two** components/things the makeup soil.

   (i)_____

   (ii) _____

3. How is humus formed?

   _____

4. State **three** importance of humus to the soil.
   (i)_____
   (ii) _____

Air as component of soil

Air is a mixture of gases.

How is air useful in the soil/to plants?

1. Oxygen supports seed germination
2. Nitrogen gas is converted into plant nitrates by nitrifying bacteria nitrogen fixing bacteria found in root nodules.
3. Plants use carbon dioxide for photosynthesis.

Experiment to show soil contains air

Requirements

- ☑ Samples of soil
- ☑ Transparent jug/beaker
- ☑ Water

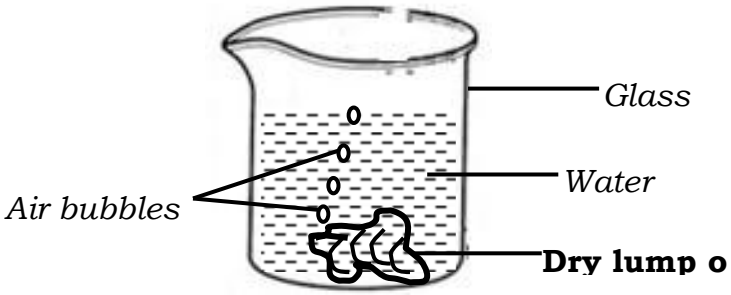
Procedure

Get a transparent jug and water
Half fill a glass jar with water
Lower a lump of soil into the water

Observation

Air bubbles will be seen coming out

Diagram of the set up



Conclusion

Soil contains air

Examples of creatures in the soil

- ☑ Earthworms
- ☑ Land snails
- ☑ Termites
- ☑ Porcupines
- ☑ Millipedes
- ☑ Bacteria
- ☑ Rats
- ☑ Squirrels
- ☑ Centipedes

Examples of mineral salts in the soil

- ☑ Iron
- ☑ Calcium

☑ Phosphorus
☑ Zinc
☑ Nitrates
☑ Magnesium

Activity

1. Define the term air.

   _____

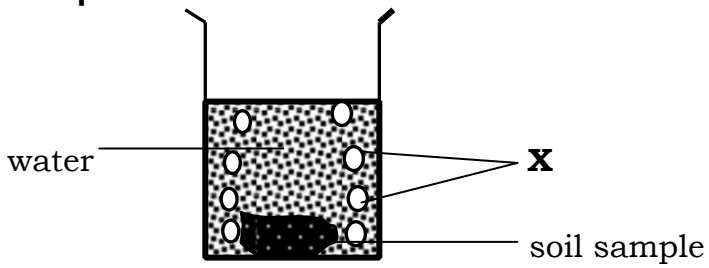
   _____

2. State any **one** property of air.

   _____

   _____

Below is an experiment about soil. Use it to answer questions that follow.



3. What is the experiment about?

   _____

   _____

4. What does letter **X** represent?

   _____

   _____

5. Give **three** uses of air to plants.
   (i)_____
   (ii) _____
6. Write down the creatures that live in the soil.
   (i)_____
   (ii) _____
7. In which way are living organisms useful in the soil?
   (i)_____
   (ii) _____

Water

Water is a colorless common liquid found on earth and it supports life.
Rain is the natural source of water. This is because it provide water to all our sources

Water is got from

1. Swamps
2. Wells
3. Boreholes
4. Oceans
5. Seas
6. Rivers/ springs

7. Lakes
8. Dams

Uses of water in the soil

- ❖ Water helps in seed germination.
- ❖ It is a raw material for photosynthesis.
- ❖ It dissolves mineral salts making it easy for plants to absorb/suck them.
- ❖ Water cools plants through transpiration.

Experiment to show that water is contained in soil

Requirements

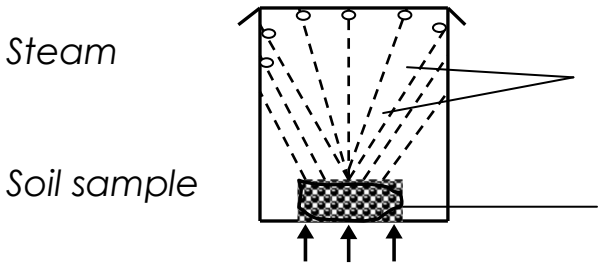
Samples of soil
Stove
Match box
Saucepan with metallic lid

Procedure

- ✍ Light the stove.
- ✍ Put a lump of soil in a container like beaker or saucepan.
- ✍ Cover the container tightly
- ✍ Put the container on the burning stove.

Observation

Water droplets are seen on the inner surface of the lid



Conclusion

Soil contains water

Activity

1. Water is said to be a common liquid on earth?

   _____

   _____

2. Identify any **two** natural sources of water.
   (i)_____
   (ii) _____
3. Write down **three** uses of water in the soil.
   (i)_____
   (ii) _____

4. State the main natural source of water in the environment.

   _____

   _____

Mineral salts

Mineral salts form plant food and they are absorbed/ sucked by plant roots hence making the plant healthy and strong.

<u>Examples of mineral salts in the soil</u>

1. Magnesium
2. Iron
3. Calcium
4. Potassium
5. Nitrates
6. Phosphorous
7. Zinc

Formation of soil

Soil is formed in two different ways:

- By weathering
- By decomposition/ rotting of organic matters

Weathering

Weathering is the breakdown of rocks into smaller particles to form soil.

Types of weathering

☑ **<u>Physical weathering</u>**
This is the breakdown of rocks by the action of force.

☑ **<u>Chemical weathering</u>**
This is the breakdown of rocks as a result of chemical reactions with other substances.

Soil is therefore a mixture of weathered rock particles and organic matter.

Human activities which cause weathering

- Cultivation
- Mining

Decomposition

This is the rotting of dead animals and plants by the action of the bacteria. It helps in the formation of humus in the soil.

Activity

1. State why mineral salts are important to plants.

   _____

   _____

2. Give **two** examples of mineral salts found in the soil.
   (i)_____
   (ii) _____
3. What is weathering?

_____

_____

4. Mention any **two** human activities which cause weathering of rocks.
   (i)_____
   (ii) _____
5. Name **two** types of weathering.
   (i)_____
   (ii) _____
6. Which type of weathering occurs as a result of the action of force?

   _____

   _____
7. Name the mineral that help our teeth and bones to develop stronger.

   _____

   _____

Types of soil

There are three types of soil. Namely;

1. Loam soil
2. Clay soil
3. Sand soil

It is wrong to say **sandy soil** instead of sand soil. Sandy is an adjective not a noun.

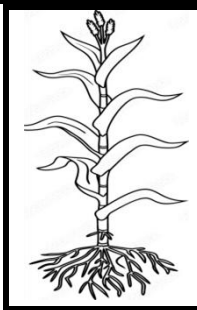
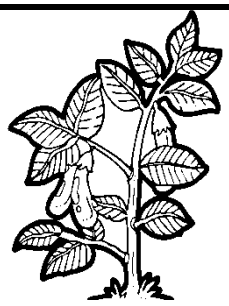
Characteristics of loam soil

- It is rich in humus hence making it fertile.
- Loam soil is a mixture of humus, sand and clay.
- It has medium – sized particles.
- It is well drained
- It contains a lot of humus.
- It is properly aerated.

Uses of loam soil

- It is used for growing crops.

Examples of crops grown on loam soil

				
Maize	Banana	Rice	Yams	Egg plants

Activity

1. Name the type of soil used for growing crops.

   _____

   _____

2. Mention two crops grown in the soil.
   (i)_____
   (ii) _____
3. Name **two** components of loam soil.
   (i)_____
   (ii) _____
4. Why is loam soil the best for crop growing?
   _____
   _____
5. Give **one** use of loam soil to people.
   (i)_____
   (ii) _____

Characteristics of sand soil

1. It has large air spaces.
2. It has big sand particles.
3. It is loose, light and easy to plough (dig).
4. It has a good drainage (it allows water to pass through easily)
5. It dries easily in hot weather due to its big space particles.
6. It is not fertile.

Sand soil is not fertile because it contains little humus.

Uses of sand soil

1. Sand is used for building houses
2. Sand is used for making blocks
3. Sand soil is used for making glasses.
4. Sand is used for making sand paper

Activity

1. Name the **two** types of soil.
   (i)_____
   (ii) _____
2. Why is sand soil not good for growing crops?
   _____
   _____
3. Which type of soil allows water to pass through it easily?
   _____
   _____
4. Give **two** uses of sand soil to people.
   (i)_____
   (ii) _____
5. Why does sand soil allow water to pass through easily?
   _____
   _____
6. Sand soil has a good drainage. What does this statement mean?
   _____
   _____

7. Give **two** differences between loam soil and sand soil.
   (i)_____
   (ii) _____

Types of soil

Characteristics of clay soil

1. Soil particles are held together.
2. It is heavy and sticky.
3. It has the finest particles.
4. It is poorly aerated
5. It is difficult to dig.
6. It has small air spaces.
7. It doesn't allow water to pass through easily.
8. It is water logged (retains a lot of water).

Uses of clay soil

- Clay soil is used for making pots
- Clay soil is used for making bricks
- Clay soil is used for making tiles

Activity

1. Give any **two** characteristics of clay soil.
   (i)_____
   (ii) _____
2. Identify the type of soil used for;
   a) Molding cups, plates: _____
   b) Growing crops: _____
   c) Construction of houses and bridges: _____
3. Why is clay soil the best soil for pottery?
   (i)_____
   (ii) _____
4. Why is clay soil not good for plant growth?
   _____
   _____
5. Give **two** uses of clay soil.
   (i)_____
   (ii) _____
6. Which type of soil has;
   a) Poor aeration: _____
   b) Good drainage: _____
   c) Rich in humus content: _____
7. What are ceramics?
   _____
   _____
8. Mention any **two** examples of ceramics.
   (i)_____
   (ii) _____

9. Draw and name these ceramics.

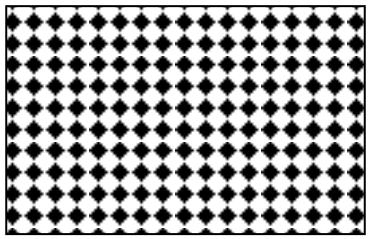
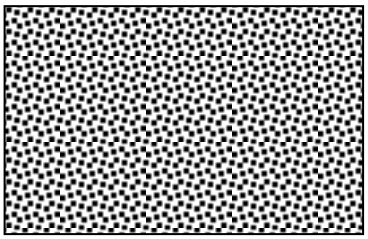
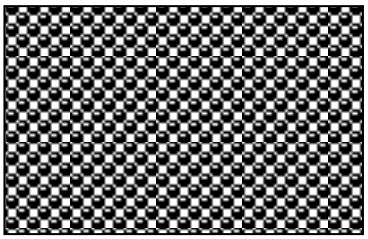
cups	plates	pots	toy

Soil texture and soil structure

This is the smoothness or roughness of soil.

Soil structure is the size of different soil particles.

The texture of different types of soil

		
Loam soil	**sand soil**	**clay soil**

Activity

1) Give the meaning of soil texture.

_____

_____

2) Apart from loam soil, name any other **two** types of soil.

(i)_____

(ii)_____

3) Describe the texture of the following types of soil.

a) Sand: _____

b) Clay: _____

4) What term is used to mean the size of different soil particles?

_____

5) Name the type of soil used for making tiles.

_____

_____

6) Name any **two** living organisms which live in the soil.

(i)_____

(ii)_____

7) Write any **two** components of soil.

_____

_____

Soil profile

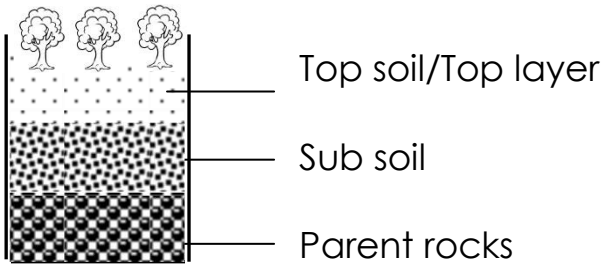
- ☑ Soil profile is the vertical arrangement of soil layers.
- ☑ Soil profile is the arrangement of soil layers from bottom to top layer.

Soil profiles can be seen well from these areas

- Deep gulley
- Newly dug pit latrines
- Trenches along the road

Soil profile is made up of three layers namely:
Top soil, sub soil and parent rocks

Illustration of soil profile



Top soil

- ☑ It is the most important layer because it has lot of humus and mineral salts that plants need.
- ☑ It is dark in colour due to a lot of humus.
- ☑ It's the best layer for plant growth.
  This is because it is made up of smaller particles.

The sub soil

- It is thicker, light brown coloured layer of rock pieces, gravels and clay.
- It has no living creatures.
- It is not good for growing crops because it id infertile.
- It is poorly aerated.

Parent rocks

- These are big rock particles found beneath/under the ground.
- They are sources of minerals.
- They are crushed for construction.
- They form soil when weathered.
- Trap underground water.
- Sources of fossil fuels.

Animals that live in the soil

- Moles
- Earthworm
- Millipedes
- Termites
- Squirrels
- Centipedes
- Rats
- Snakes

Activity

1. What is soil profile?

_____

_____

2. Which layer of the soil profile contains most humus?

_____

_____

3. Identify one place where we can observe soil layers in the environment.

_____

_____

4. Why does the top layer of soil support plant growth?

_____

_____

5. Why do most soil organisms live on the top layer?

_____

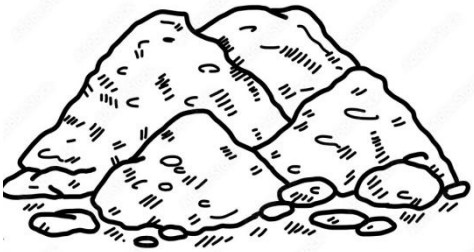
_____

6. Which layer is the source of minerals and traps underground water?

_____

_____

Name the component of the environment shown in the diagram below.

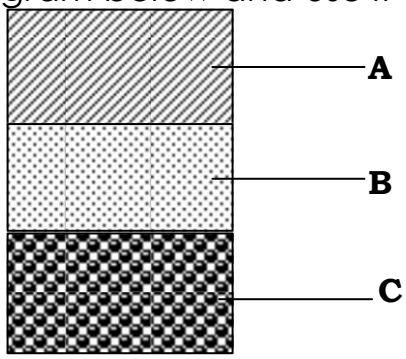


7. State **two** living organisms which live in the component shown above.

(i)_____

(ii) _____

8. Study the diagram below and use it to answer the questions about it.



a) Name the layer of soil marked with letter

(i) A: _____

(ii) B: _____

(iii) C: _____

b) Which layer of soil contained leaches minerals?

_____

_____

c) Give an example of

Light soil: _____

Heavy soil: _____

Soil erosion

This is the removal of top soil by its agents.

Agents of erosion

These are factors that help soil erosion to take place.

Examples are;

a) Flowing water
b) Wind (moving air)
c) Moving animals

Types of soil erosion

a) Sheet erosion

This is a type of erosion which takes place in flat area and soil is uniformly removed.

b) Splash erosion

This is the type of erosion which takes place in bare ground. It removes soil by splashing it away by water droplets.

c) Rill erosion

This is where small and shallow ditches are dug by the flowing water.

d) Gulley erosion

This is where bigger and deeper ditches are dug by the flowing water.

Activity

1. What is soil erosion?

_____

_____

2. Give another name for wind

_____

_____

3. Name **two** agents of soil erosion.

(i)_____

(ii) _____

4. Identify any **two** types of soil erosion.

(i)_____

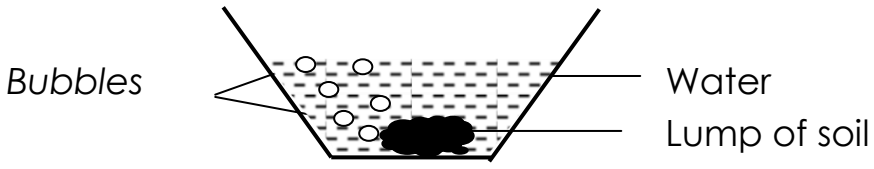
(ii) _____

5. What do we call the type of soil erosion where soil is removed by water droplets that splash soil away from a bare ground?

_____

_____

6. What does the experiment below prove about soil?



_____

_____

Causes of soil erosion

1. Deforestation
2. Bush burning
3. Leaching
4. Monocropping / monoculture
5. Overgrazing
6. Over cultivation

Effects of soil erosion:

- It causes desertification.
- It leads to famine.
- It leads to soil exhaustion.
- It creates unnecessary gulley.
- It leads to silting.

Silting is the decomposition of silts in water.

Silts are materials carried by water from one place to another

Examples of silts

1) Soils
2) Dead plants and animal wastes

Control of soil erosion

These are control measures suggest the ways through which soil erosion can be controlled.

Ways of controlling soil erosion

Afforestation

Intercropping/mixed cropping

Contour ploughing

Crop rotation

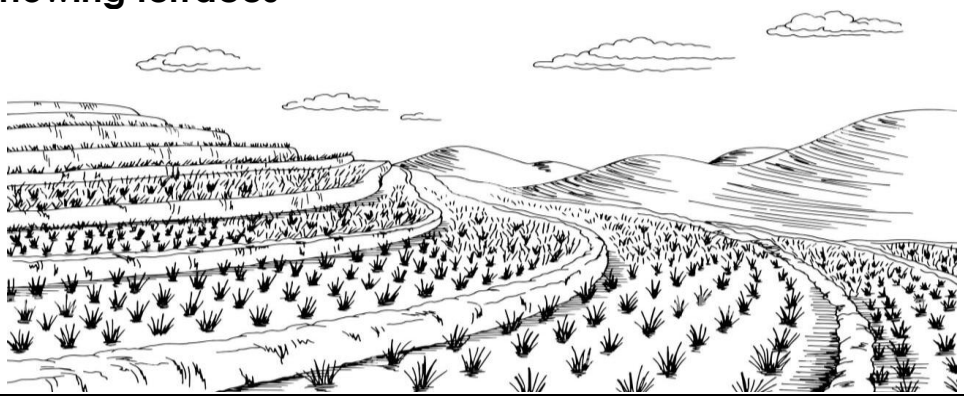
By mulching

Terracing

Terracing is the cutting of steps on a slope/a hill

Terraces reduce the sped of running water from the top of the hill

Diagram showing terraces



Activity

1. What is;
   a) Soil erosion?

   _____

   _____

b) Deforestation?

_____

_____

c) Mulching?

_____

_____

2. State **two** causes of soil erosion.
   (i)_____
   (ii) _____
3. Suggest **two** ways to control soil erosion.
   (i)_____
   (ii) _____

1) Match items in list A to their meanings in List B

List A	**List B**
Terracing	Is the cutting down of trees without replanting them
Deforestation	Is the growing of different type of crops on the same piece of land
Crop rotation	the covering of top soil with dry plant material
Mulching	The cutting of steps on a slope/a hill

a) Terracing: _____

b) Deforestation: _____

c) Crop rotation: _____

d) Mulching: _____

Mulching

Mulching is the covering of top soil with dry plant materials

Plant materials used in mulching are called mulches.

Examples of mulches

1. Dry banana leaves
2. Dry maize stalks
3. Dry grass
4. Spear grass.
5. Coffee husks

Advantages of mulching:

1) It keeps water in soil.
2) Mulching controls pests
3) Mulching improves soil fertility
4) It rots to form manure.
5) It controls growth of weeds.
6) Mulching controls soil erosion.

Mulch prevent direct contact of top soil with strong winds / storms

Disadvantages of mulching

1) It hides crop pests.

2) Mulch can be fire hazards.
3) Some mulch can turn into weeds.
4) Mulching is tiring
5) It is expensive to carry out.

ACTIVITY

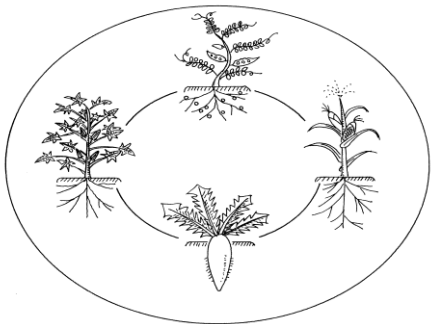
Below is a common practice of controlling soil erosion. Use it to answer the questions that follow.

1. Name the common farming practice shown above.
   _____
2. Name **two** examples of mulches.
   (i)_____
   (ii) _____
3. Give **two** reasons why farmers mulch their gardens.
   (i)_____
   (ii) _____
4. Give **two** common pest which hide in the mulches
   (i)_____
   (ii) _____
5. Mention **one** disadvantage of mulching.
   (i)_____
   (ii) _____

Crop rotation

Crop rotation is the growing of different types of crops on the same piece of land seasonally.

Diagram showing crop rotation



Why are legumes included while practicing crop rotation?

Legumes add nitrates to soil which makes it fertile.

Advantages of crop rotation

1) It controls soil erosion.
2) It improves on soil fertility.

3) It controls crop pests and diseases.

ACTIVITY

1. What is crop rotation?

   _____

   _____

2. State any **two** advantages of practicing crop rotation.
   (i)_____
   (ii) _____
3. Why are legumes included while practicing crop rotation?

   _____

   _____

4. State **two** examples of leguminous plants.
   (i)_____
   (ii) _____

LESSON

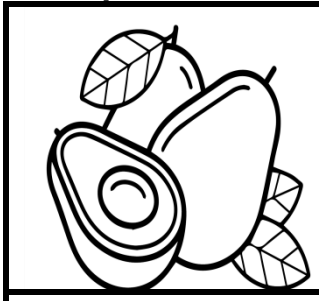
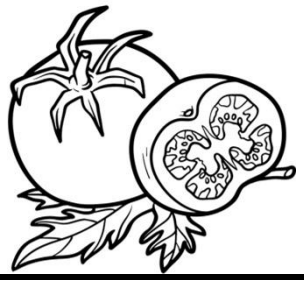
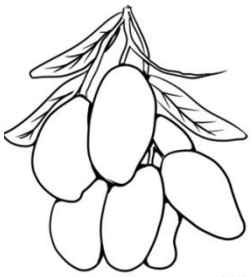
Trees that provide timber

- Musizi tree
- mvule tree
- Eucalyptus tree
- Pine tree

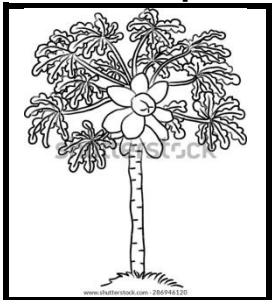
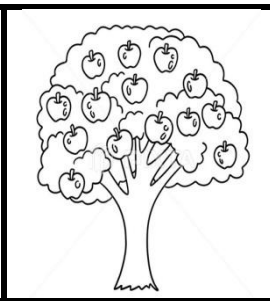
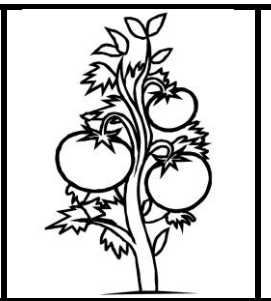
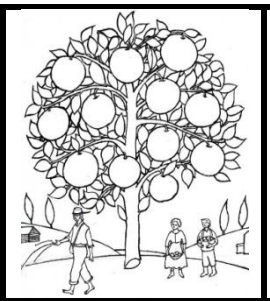
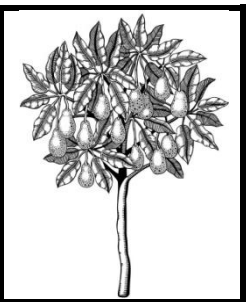
TREE PLANTING PROJECT

Fruit trees are trees that bear fruits.
Some fruits are eaten by us while others are not.
We cannot eat some of the fruits because they are poisonous to us and animals.

Examples of common fruits

			
Avocado	**Cherry**	**Tomato**	**Mangoes**

Trees that provide fruits

				
Paw paw plant	Apple plant	Tomato plant	Orange plant	Avocado plant

Other examples are

- Mango tree

- ✍ Orange tree
- ✍ Lemon tree
- ✍ Jackfruit

Importance of trees in the environment

1. Trees act as wind breaks
2. Trees influence rain formation
3. Trees provide shade
4. Trees are habitats for some animals
5. Trees provide wood fuel
6. Trees provide timber
7. Fruit trees are source of food.

ACTIVITY

1. Name any **two** examples of trees which are sources of food in the environment.

   _____

   _____
2. Apart from providing food, how else are trees useful to people?

   _____

   _____
3. Give any **two** examples of trees planted for timber production.
   (i)_____
   (ii) _____
4. State **two** animals which live on trees.
   (i)_____
   (ii) _____

Soil exhaustion

Soil exhaustion is the process by which soil losses its fertility.

Soil fertility is the ability of the soil to support plant life.

Causes of soil exhaustion

a) Bush burning
b) Mono-cropping/monoculture
c) Over grazing
d) Over cultivation
e) Bush burning
f) Deforestation
g) Leaching

How to control soil exhaustion

- ✍ By mulching
- ✍ Use of fertilizers
- ✍ Use of crop rotation
- ✍ Addition of manure
- ✍ Controlled grazing
- ✍ By planting trees

Activity

1. Explain the following terms;
   a) Soil exhaustion

   _____

   _____

   b) Soil fertility

   _____

   _____

2. Mention any **four** bad farming practices that can result into soil being infertile.
   (i)_____
   (ii) _____
3. Define the following;
   a) Monoculture

   _____

   _____

   b) Over grazing

   _____

   _____

   c) Deforestation

   _____

   _____

4. Give **two** causes of soil exhaustion.
   (i)_____
   (ii) _____
5. Give **two** ways a farmer can control soil exhaustion.
   (i)_____
   (ii) _____
6. State any **one** method of controlling soil erosion on the school compound.
   (i)_____
   (ii) _____

Soil conservation

Soil conservation is the practice of maintaining soil fertility.

Soil fertility refers to the ability of the soil to produce and sustain high crop yields indefinitely.

How to conserve the soil

To conserve means to use something sparing so that it lasts for long.

Soil can therefore be conserved in order to retain its fertility in the following ways;-

a) Practice crop rotation
b) Mulching
c) Bush fallowing
d) Terracing in hilly areas

Activity

1. What is soil conservation?

   _____

   _____

2. What term describes the ability of the soil to produce and sustain high yields?

   _____

   _____

3. Mention any **two** ways to conserve soil.
   (i)_____
   (ii) _____

4. Suggest **two** reasons why we should conserve soil.
   (i)_____
   (ii) _____

THEME 2: NATURAL CHANGES IN THE ENVIRONMENT

Changes in the environment

Change is when something turns from one form to another form.

There are two main types of changes namely

- ✍ a)Natural changes
- ✍ b)Man-made changes (Artificial changes)

Natural changes

Natural changes are changes that occur and exist by nature.

Natural changes are changes in the environment that are not caused by man.

Examples of these changes include:

- o The sun rises from the East and sets in the West.
- o Wind blows from different directions.
- o Clouds appear in the sky.
- o The moon appears at night
- o The sun is seen in the sky at day time and sets in the evening.
- o Floods are brought in by heavy rains.

Places where natural changes occur.

a) In plants
b) In animals
c) On land
d) In the atmosphere

Causes of natural changes in our environment

✍ Earthquakes	✍ Storms	✍ Mudslide
✍ Hailstones	✍ Drought	✍ Thunder
✍ Floods	✍ Lightning	

ACTIVITY

1. Name the **two** types of changes in the environment.
   (i)_____
   (ii) _____

2. What are natural changes?

_____

_____

3. Write down **two** examples of natural changes.

(i)_____

(ii) _____

4. Identify **two** dangers of natural changes.

(i)_____

(ii) _____

5. What causes flood?

_____

6. In which way do floods affect crop farmers?

_____

_____

7. State **two** weather changes which affect crop growing?

(i)_____

(ii) _____

8. Suggest **two** ways of managing natural changes.

(i)_____

(ii) _____

Natural changes which occurs in plants

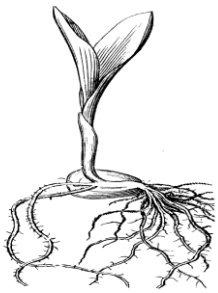
- Germination
- Fertilization
- Transpiration
- Drying
- Photosynthesis
- Pollination

Definitions of changes which take place in plants

☑ **Germination**

Germination is the process by which a seed grows in to a seedling. Seedling is a young growing plant.

Dicotyledonous seedling



Monocotyledonous seedling

☑ **Fertilization**

Fertilization is the process by which mature plants produce seeds or young plants

☑ **Transpiration**

Transpiration is the process by which plants loose excess water to the atmosphere.

Transpiration is the process by which excess water passes out from the plant through stomata.

☑ **Drying**

Drying is when plants loose water and chlorophyll.
Chlorophyll is the green colouring matter found in the leaves.
Chlorophyll help plants to carryout photosynthesis.

☑ **Photosynthesis**

Photosynthesis is the process by which plants make their own food.

☑ **Pollination**

☑ Pollination is the transfer of pollen grains from one flower to another to produce seeds or fruits

Illustration of pollination

Activity

1) What are natural changes?

_____

_____

2) What do you understand by the process by which a seed grows in to a seedling?

_____

_____

3) Mention any **two** conditions needed for germination to take place.
(i)_____
(ii)_____

4) What is transpiration?

_____

_____

5) Why do plants dry up?

_____

6) What helps plants to make their own food?

_____

_____

7) Seedling is a young growing _____.

8) Name the green colouring matter found in the leaves.

_____

9) Mention **two** natural causes of changes in the environment.
(i)_____
(ii)_____

Natural changes in animals

Natural changes which take place in animals include:

- Reproduction
- Moulting
- Dying

Effects/dangers of natural changes

(a) Natural changes cause hunger
(b) Destruction of homes
(c) Soil erosion
(d) Disease outbreaks
(e) Migration
(f) Destruction of homes and property

Death of people and animals

Ways of managing these changes

a) Planting more trees
b) Graze few animals
c) Conserve wetlands
d) Carryout rural electrification to reduce deforestation

Rural electrification is the extension of electricity to rural areas.

ACTIVITY

1) What are natural changes?

_____

_____

2) Mention **two** natural causes of changes in the environment.
   (i)_____
   (ii) _____
3) Mention any **two** ways of managing natural changes
   (i)_____
   (ii) _____
4) State any **one** effect of natural changes in the environment.
   (i)_____
   (ii) _____

People – made changes

Man made changes are changes that take place due to man's influence. They are also called artificial changes.

Examples of man made changes

- ☑ Fishing
- ☑ Building houses
- ☑ Making furniture
- ☑ Swamp reclamation
- ☑ Burning bushes
- ☑ Deforestation
- ☑ Brick making
- ☑ Making medicine from plants
- ☑ Construction of roads
- ☑ Making of vehicles
- ☑ utting down trees
- ☑ Growing crops

Good effects of man made changes

- They bring new and nice look to our environment
- We get food through farming
- Easy treatment due to medicines made

- Easy transport system due to good roads and vehicles manufactures.
- Clean water for human use due to wells and boreholes built.

Bad/negative effects of man made changes

- Pollution from smoke in industries
- Soil erosion due to bush burning
- Drought due to deforestation and swamp reclamation
- Homeless of wild animals

Activity

1. What are man-made changes?

   _____

   _____
2. Give **two** examples of changes caused due to man's activities.
   (i)_____
   (ii) _____
3. Identify **two** good effects of man – made changes.
   (i)_____
   (ii) _____
4. Write down **two** negative effects of man – made changes in the environment.
   (i)_____
   (ii) _____
5. What is deforestation?

   _____

   _____
6. Mention **two** reasons why people carryout deforestation
   (i)_____
   (ii) _____

Ways of managing changes:

(a) How to manage floods

Flood is when the drainage is full of water beyond usual.
Flood is caused by heavy rains

How to manage floods

- Dig big trenches to avoid floods.
- Avoid draining swamps because they trap running water.
- Do not grow crops in swamps
- Do not build in swamps

(b) How to manage drought

Drought is a long period of sunshine without rain.

It is caused by heavy/ prolonged sunshine.

1. Plant trees.
2. Avoid draining wet lands.
3. Dig valley dams.
4. Use irrigation method.
5. Avoid burning bushes.

6. Proper farming methods e.g. crop rotation, terracing, mulching.
7. Covering gullies with stones.
8. Educating people about dangers of deforestation.
9. Avoid poor disposal of wastes.

Effects of drought

1. It dries up crops
2. It leads to water shortage
3. It increases temperature
4. It causes famine

ACTIVITY

1. What is flood?

   _____

   _____

2. What causes floods?

   _____

   _____

3. Give **two** ways of managing floods in our environment.
   (i)_____
   (ii) _____
4. Identify any **one** change which can be controlled by digging the trenches.

   _____

   _____

5. What is drought?

   _____

   _____

6. Name the season in which drought is very common.

   _____

   _____

7. What causes drought?

   _____

   _____

8. Give **two** ways of managing drought.
   (i)_____
   (ii) _____
9. State **two** effects of drought on living things.
   (i)_____
   (ii) _____
10. State any **two** proper methods of farming which can control drought.
    (i)_____
    (ii) _____

THEME III: ENVIRONMENT AND WEATHER IN OUR SUB-COUNTY

Weather

Weather is the condition of the atmosphere at a given time.
The average weather condition of a place recorded for a long period of time is called **climate**

Types / states / conditions of weather

1. Rainy weather
2. Sunny weather
3. Cloudy weather
4. Windy weather

Elements of weather (factors / weather makers / aspects of weather

1) Rainfall
2) Humidity
3) Air pressure
4) Sunshine
5) Temperature
6) Cloud cover

ACTIVITY

1. What is weather?

   _____

   _____

2. What term is used to mean the average weather condition of a place recorded for a long period of time?

   _____

   State any **two** conditions of weather.
   (i)_____
   (ii) _____

3. Mention any **two** conditions of weather which affects farming greatly.
   (i)_____
   (ii) _____

4. Which element of weather shows rainfall?

   _____

   _____

5. Mention any **two** elements of weather.
   (i)_____
   (ii) _____

6. **Match the weather condition to the correct weather maker**

Weather condition	**Weather maker**
Windy	Cloud cover
Cloudy	Rainfall
Rainy	Sunshine
Sunny	Wind

LESSON

Air

Air is a mixture of gases.

Wind is the moving air / Wind is air in motion.

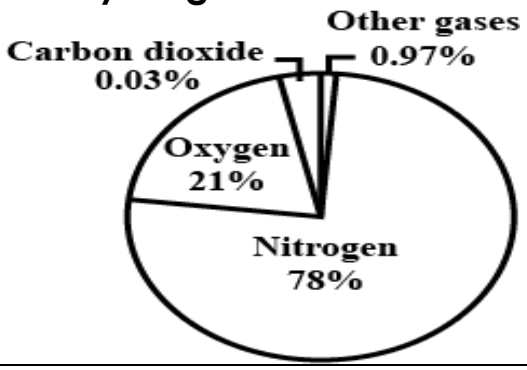
Components of air

- Nitrogen
- Oxygen
- Rare gases
- Carbon dioxide

Percentage composition of air in the atmosphere

- Nitrogen 78%
- Oxygen 21%
- Rare gases 0.97%
- Carbon dioxide 0.03%

Summary diagram



Activity

1. What do we call the mixture of gases?

   _____

   _____

2. Explain the term;

a) Air

   _____

   _____

b) Wind

   _____

   _____

3. Write down **two** components of air.

   (i)_____

   (ii) _____

4. Name the gas which takes;

c) The highest percentage in air.

   _____

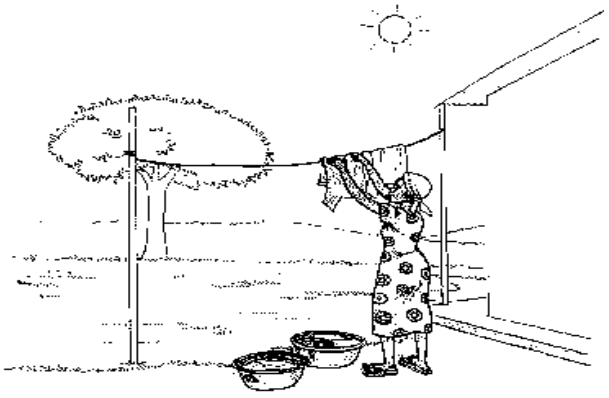
d) The lowest percentage in air.

   _____

5. Which component of weather dries clothes at night?

   _____

6. Name **two** gases found in the group of rare gases.
   (i)_____
   (ii) _____
7. State the use of air shown below



_____

Properties of air

Properties of air are ways in which air behave.

They include:

- Air has weight
- Air occupies space
- Air exerts pressure
- Air expands when heated.
- Air can be compressed
- Air can be felt

Experiment show that air has weight

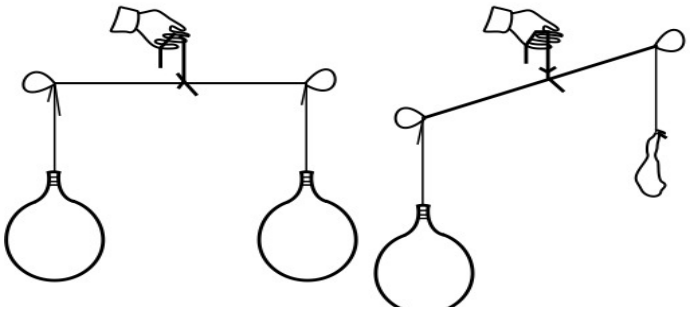
Materials needed

- Two balloons
- Two strings
- Beam balance

Steps to follow

1. Fill the balloons with air.
2. Put a beam balance on a leveled table top
3. Tie the two balloons on the end of the beam balance
4. Prick one balloon with a pin to remove air.

Diagram of the experiment

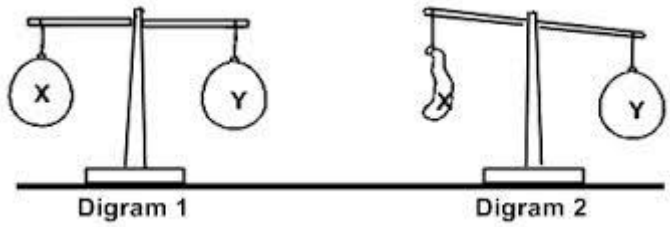


Observation: The inflated balloon goes lower than the deflated one.

Conclusion: Air has weight.

Activity

1. Write any **two** properties of air.
   (i)_____
   (ii) _____
2. *Study the experiment below and answer the questions that follow.*



3. Name the property of air shown above.
   _____
   _____
4. Why does the inflated balloon appear on the lower side in diagram 2?
   _____
   _____
5. State **two** examples of rare games.
   (i)_____
   (ii) _____
6. Give **two** games which are found in the environment.
   (i)_____
   (ii) _____
7. Which gas occupies the highest percentage of the atmosphere?
   _____
   _____

Experiment to show that air occupies space

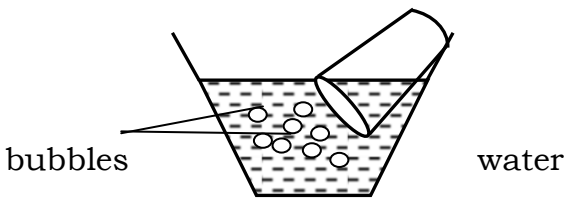
Materials needed

Glass
Basin (trough)
Water

Steps to follow

1. Fill the trough ¾ with water
2. Lower an inverted glass directly into the water
3. Bend the glass slightly and observe

Diagram of the experiment



Observation

Air bubbles are seen escaping from the glass

Conclusion

Air occupies space

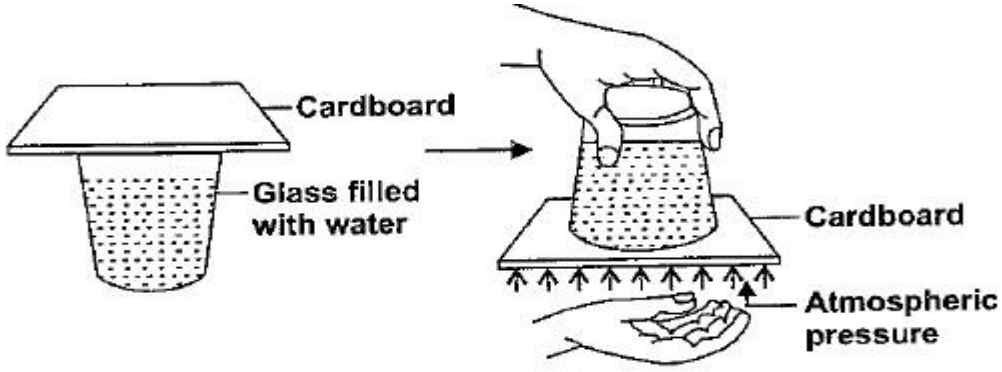
Experiment to show that air exerts pressure

Materials to use

Card board (hard paper)
Glass
Water

Steps to follow

1. Half fill a glass with water.
2. Cover it with a card board.
3. Turn it upside down while holding the cardboard
4. Leave the cardboard and observe.



Observation: The card board is held on the mouth of the glass.
Conclusion: Air exerts pressure.

Activity

Experiment to show that air can be compressed

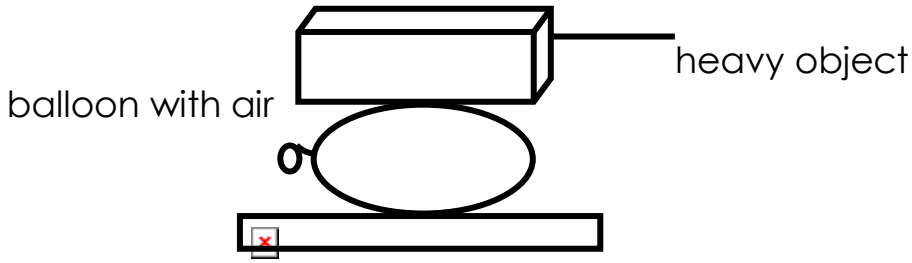
Materials to use

A ball or a balloon

Steps

1. Inflate a balloon
2. Place it on a flat surface
3. Step on it and observe

Diagram of the experiment

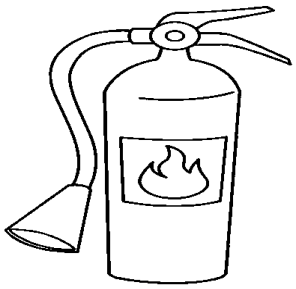


Observation: The balloon loses shape
Conclusion: Air can be compressed.

Some other things where compressed air is used are:

a) Gas cylinders.
b) Playing balls

c) Tubes in bicycle/motorcycle tyres and car tyres.

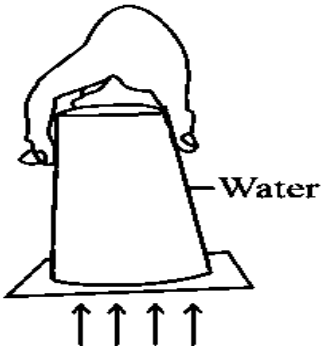


Places where we find fire extinguishers

1. Petrol stations
2. Schools
3. Hospitals
4. Banks
5. Hotels
6. Homes

Activity

Study the experiment below and answer the questions that follow.



1. What does the arrow on the diagram represent?

   _____

   _____

2. What does the diagram above experiment about air?

   _____

   _____

3. Which property of air helps a P.3 child to suck soda from the bottle using a straw?

   _____

   _____

4. State **two** properties of air.
   (i)_____
   (ii) _____
5. Name the component of air compressed in fire extinguisher.

   _____

   _____

6. What is the main use of the tool above?

   _____

   _____

An experiment to show that air expands when heated

Materials needed

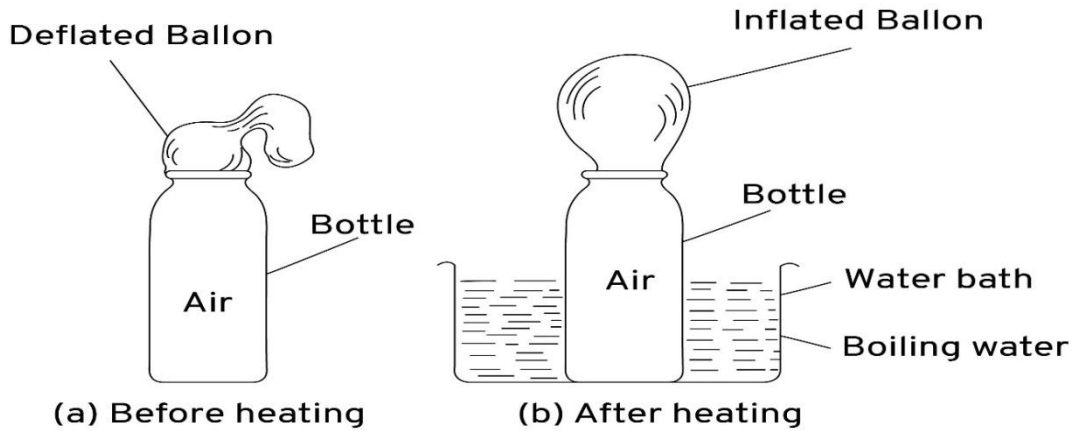
1. Two bottles of same size
2. Hot and cold water

3. Two balloons

Steps to follow

1. Fix a balloon on top of each bottle
2. Label the bottles a and b
3. Place one of the bottles in cold and the other one in hot water for some minutes and observe.
4. Change the one which was in cold water to hot water and vice versa

Diagram of the experiment



Observation

The balloon of the bottle put in hot water swells up and when put in cold water, it collapses.

Conclusion

Air expands when heated.

Measurements of air pressure

Air pressure is a force exerted by air columns on an object.
Air pressure is measured using an instrument called barometer.

Uses of air

- Oxygen supports burning.
- Air is used for transport (Aeroplanes).
- Wind is a source of power to drive wind mills.
- Oxygen is used in germination.
- Carbon dioxide is used to preserve drinks.
- Wind is used in winnowing seeds.
- Butane gas is used in gas cookers.
- Air is used by birds to fly.
- Wind is an agent of pollination.
- Wind is an agent of seed dispersal
- Moving air helps to cool our bodies.
- Wind sails boats/ships/paper kites.
- Carbon dioxide is used in fire extinguishers to put out fire.
- Wind is used for flying kites

Activity

1. Name the component of air used in preserving foods and drinks.

_____

_____

2. Which type of air supports burning?

   _____

   _____

3. Give three uses of air.

   _____

   _____

4. Why is carbon dioxide used in fire extinguishers?

   _____

   _____

5. What do we call the force exerted by air on an object?

   _____

   _____

6. Name the instrument used to measure air pressure.

   _____

7. Mention any **two** changes in the environment which needs oxygen to take place.

   (i)_____

   (ii) _____

Wind is moving air/ it is the air in motion.
Wind is the air in motion
Air is the mixture of gases

Types of wind

(a) Calm wind
(b) Light wind
(c) Strong wind
(d) Gale wind
(e) Stormy wind

<u>Importance of wind in the environment</u>:

- Wind is an agent of pollination.
- Helps to bring cold air in warm places
- Helps in pollinating plants
- Helps in winnowing
- Helps in the formation of rainfall
- It sails boats
- It flies kites
- It dries wet things like paint, decorated cakes, clothes

Disadvantages of wind

- Strong wind carries away top soil.
- Storms kill people
- Strong winds blow off roofs of houses
- Air spreads air borne diseases like flu, measles mumps/tuberculosis
- It makes boats to capsize/over turn
- Wind raises dust, spoiling our eyes and environment as well.
- Oxygen makes metals rust
- Strong winds break trees

Activity

1. What do we call moving air?

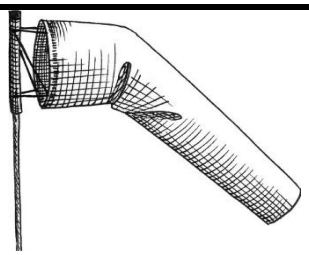
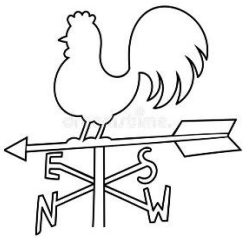
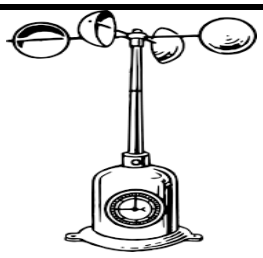
   _____

2. Write any **two** diseases spread by air.
   (i)_____
   (ii) _____
3. Which component of air supports rusting in irons?

   _____

   _____
4. Mention **two** ways how wind is dangerous to our community.
   (i)_____
   (ii) _____
5. State **two** types of wind.
   (i)_____
   (ii) _____
6. State **two** games played with the help of wind.
   (i)_____
   (ii) _____
7. State **two** importance of wind to farmers.
   (i)_____
   (ii) _____
8. Mention any **two** importance of wind to plants
   (i)_____
   (ii) _____

Diagram showing wind instruments.

Wind sock	Wind vane	Anemometer
		
It measures wind strength	It measures wind direction	It measures wind speed

Aspects of wind

- Wind strength
- Wind direction
- Wind speed

ACTIVITY

1. State any **two** uses of wind to people.
   (i)_____
   (ii) _____
2. Name the use of the following wind instruments.
   (a) Wind sock_____

(b) Wind vane_____

(c) Anemometer _____

3. State **two** uses of wind to a farmer.

(i)_____

(ii) _____

4. Mention **two** aspects of wind that we measure and record.

(i)_____

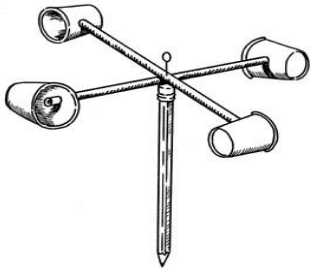
(ii) _____

5. Give any **two** disadvantages of wind.

(i)_____

(ii) _____

6. **Below is a diagram of a weather instrument. Use it to answer questions that follow.**



7. Name the wind instrument shown below.

_____

_____

8. What is the use of weather instrument shown above?

_____

_____

9. Which aspect of wind is recorded using the instrument above?

_____

_____

10. Mention any other **two** wind instruments found at weather station.

(i)_____

(ii) _____

Rusting

Rusting is the turning of iron metals reddish brown in the presence of oxygen and water.

Rust is the reddish brown substances formed on the metals.

Conditions needed for rusting to take place

- presence of oxygen
- water
- warmth

Dangers of rusting

1. It makes sharp edges of metals blunt.
2. Metals develop holes and become weak and they also leak.
3. Metals become wasted.

Effects of rusting on metals

- Rusting weakens metals
- It changes the colour of metals
- It makes metal containers and roofs to leak
- It makes sharp objects very blunt

Ways of controlling rusting in metals

- Put metals in a dry cool place
- Paint the metals
- Clean the working tools well before taking them inside
- Galvanize the metals

Activity

1. State three dangers of air to us.

   _____

   _____

2. Define rusting.

   _____

   _____

3. Name **two** conditions necessary for rusting to take place.
   (i)_____
   (ii) _____
4. List **two** dangers of rusting.
   (i)_____
   (ii) _____
5. Suggest **two** ways of control rusting metals.
   (i)_____
   (ii) _____

The sun

The sun is the main natural source of heat and light in the environment.
Sunshine is the heat and light we get from the sun.

The sun rises from the East every morning.
It sets in the west every evening.
Moon is not a source of light because it emits light from the sun.

Uses of the sun

- ☑ The sun provides heat energy
- ☑ The sun provides light energy
- ☑ Helps plants to make their own food
- ☑ Provide heat for vitamin D formation
- ☑ Heat from the sun kills some germs/vectors
- ☑ Helps in the formation of rainfall
- ☑ Heat from the sun helps to dry our seeds and clothes.

Dangers of the sun

- Too much sunshine dries crops in the garden.
- Too much sunshine dries water bodies.
- Too much sunshine leads to drought.

- Sunny weather makes animals thirsty.
- Strong sunshine has rays which can cause skin cancer.
- The sun spoils our eyes if you look at it directly.

Activity

1. Where does the sun rise from?

   _____

   _____

1. Give **two** examples of natural sources of energy.
   (i)_____
   (ii) _____
2. Name the main natural source of heat and light.

   _____

   _____
3. What term is used to mean a long period of sunshine without rain?

   _____

   _____
4. Why is moon not regarded as a source of light?

   _____

   _____
5. State any **one** use of sun:
   (a) to farmers

   _____

   (b) in controlling diseases caused by vectors

   _____

   (c) to plants

   _____

   _____
6. Mention **two** reasons why the sun is dangerous to us.
   (i) _____
   (ii)_____
7. From which direction does the sun:
   a) Rise:_____
   b) Set:_____
8. What name is given to the heat and light we get from the sun?

   _____

   _____
9. Name the sense organ spoilt by the sun if we look at it directly.

   _____

   _____
10. How is the sun useful to our bodies?

    _____

    _____
11. State any **two** weather conditions which dry clothes.
    (i)_____
    (ii) _____

Shadows and opaque objects

What is a shadow?

A shadow is a dark shape formed when light is blocked by an opaque object.

What is an opaque object?

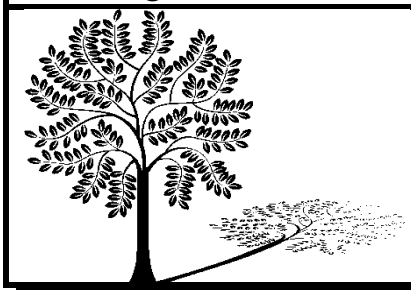
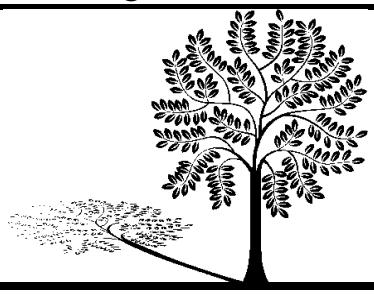
An opaque object is an object that does not allow light to pass through.

- Shadows are longer in the morning and evening.
- Shadows are shorter at mid-day and noon.

Importance of shadows in our environment

✍ To tell time during the day.
✍ To show direction during day

How shadows appear at different hours of the day

A shadow in the morning	A shadow at noon (midday)	A shadow in the evening
		

Activity

1. What is a shadow?

   _____

   _____

2. What are opaque objects?

   _____

   _____

3. How are shadows useful to people?

   _____

   _____

4. Where does the sun appear to
   (a) Rise?: _____
   (b) Set? : _____
5. When is the shadow of an object shorter?

   _____

   _____

6. How are shadows useful to people?

   _____

   _____

Water

Water is the colorless and tasteless liquid formed from hydrogen and oxygen.

Water is the most common liquid on earth and it supports life.

Rain is the main natural source of water.

Rain gives water to other sources of water.

These sources of water are classified in to two namely:

- Natural sources
- Man made sources

Natural sources of water are the points where we get water naturally

Examples of natural sources of water

Lakes, rivers, swamps, steams, oceans, rain seas

Man made sources

Man made sources of water are the points where we get water by artificial means

Examples of manmade sources of water

Bore holes, taps, tanks, valley dams, wells, ponds and springs

Properties of water

- Has the highest capacity
- Boils at 100^0C and cools at 0^0C
- High surface tension
- Water is colorless
- Water is tasteless
- Water can find its level in a container
- Water has no smell
- Water is the universal solvent

  This is because it dissolves most of the solutes.

Activity

1. Name any **two** natural sources of water.
   (i)_____
   (ii) _____
2. Name any **two** artificial sources of water.
   (i)_____
   (ii) _____
3. Mention any two properties of water.
   (i)_____
   (ii) _____

Below is a diagram of atmospheric condition. Use it to answer questions that follow.

4. Mention any **two** elements of weather shown above.
   (i)_____
   (ii) _____
5. Which element of water gives us rain?

   _____

   _____
6. Name the main natural source of water.

   _____
7. Name the instrument used for measuring rainfall.

   _____

Advantages of water to people

- ☑ For domestic use like cooking, washing, bathing
- ☑ For mixing motor (sand & cement + stone) for construction
- ☑ Watering crops/irrigation
- ☑ For fishing
- ☑ For cleaning the environment
- ☑ Distilled water is used in hospitals
- ☑ Means of transport
- ☑ Water is a coding agent
- ☑ For hydro electricity

Advantages of water to plants

1. Water is a raw material for photosynthesis
2. Water cools the plant through transpiration
3. water is used for seed germination
4. It dissolves mineral salts
5. Water is an agent of seed dispersal
6. It is used for watering crops.

Disadvantages of water

(a) It causes accidents like near drowning.
(b) It can lead to rotting of crops if it is too much in the soil.
(c) It spreads diseases.
(d) Running water takes away crops.
(e) Running water causes soil erosion.

Activity

1. Give **two** ways how water is important at home.
   (i)_____
   (ii) _____
2. State any **two** natural sources of water.
   (i)_____
   (ii) _____
3. Mention other **two** importance of water apart from being used at home.
   (i)_____
   (ii) _____

4. List **two** disadvantages of water.
   (i)_____
   (ii) _____

Changes in water

Water can turn from one form to another.

Common natural changes in the environment

- ☑ **Steams**
  When water is boiled or over heated, it turns in to steams
- ☑ **Dews**
  When water vapour in the atmosphere is cooled down at night, it formed small drops called dews.
- ☑ **Ice**
  When water is over cooled or put in to a freezer, it turns in to ice
- ☑ **Rainfall**
  Rain is the droplets of water falling down from the nimbus cloud. When water vapour is cooled by the nimbus cloud in the sky, it causes rain drops.
- ☑ **Water vapour**
  When water from a water body is heated by the sun, it turns in to gaseous form and rises to the atmosphere and form water vapour. This water vapour is called humidity.
  Humidity is measures using a weather instrument called **Hygrometer**.

Activity

1. What name is give to water in these forms?
   (a) Solid state
   _____
   (b) Gaseous state
   _____
2. What is humidity?
   _____
   _____
3. Name the instrument used to measure the amount of water vapour.
   _____
   _____
4. What is rainfall?
   _____
5. What term is used to mean the amount of rainfall collected in an area?
   _____
6. State any **two** importance of water to:
   (a) Plants
   (i)_____
   (ii) _____
   (b) Animal
   (i)_____
   (ii) _____

Harvesting water

Water harvesting is the collection of rain water for domestic use or irrigation.

We can harvest water for domestic use and other uses away from home.

Water harvesters

Water harvesters refer to containers in which we collect and store water.

We use these items for collecting/harvesting water

- ✍ Buckets
- ✍ Pails
- ✍ Jerrycans
- ✍ Pots
- ✍ Tanks
- ✍ Basins
- ✍ Saucepans

Importance of harvesting water

- ❖ It provides water for home use.
- ❖ It provides water for irrigation.
- ❖ Harvested water can be used later when water is scarce.

Ways of saving water.

- ❖ Through building water tanks.
- ❖ Through constructing valley dams.
- ❖ By closing taps when not in use.

Activity

1. Name **two** items used to collect/harvest water.
   (i)_____
   (ii) _____
2. **Name the container shown below**

_____

3. Identify **two** uses of water to man
   (i)_____
   (ii) _____
4. Name the process by which plants make their own food.

   _____
5. State any **one** raw material for photosynthesis.
   (i)_____
   (ii) _____
6. Mention **two** ways by which plants use water.
   (i)_____
   (ii) _____

Water contamination

Water for human use needs to be clean and safe.

It should be free from germs and minerals and is not harmful to support life.

Water contamination is making water dirty for human consumption.

How water sources get contaminated

Water gets dirty/ contaminated through:

- Use of dirty containers
- When we swim and bathe in water sources.
- When animals drink from water sources and urinate in water.
- When we throw rubbish in water.
- Disposal of industrial wastes into water
- Pouring agricultural chemicals into water
- Building latrines near water sources
- Washing clothes in water sources.

Ways of maintaining water sources

- ☑ Use clean containers.
- ☑ Avoid bathing in water sources.
- ☑ Don't take animals to drink from water source.
- ☑ Don't pour rubbish in/near water sources.
- ☑ Avoid pouring chemicals in water.
- ☑ Fencing the water sources.
- ☑ Remove weeds from water sources.

Activity

1. What do we mean by water contamination?

   _____

   _____
2. Why is it good to use clean containers to harvest water?

   _____
3. State **two** diseases got by using dirty water.

   (i)_____

   (ii) _____
4. Write down **two** ways through which water gets contaminated.

   (i)_____

   (ii) _____
5. Suggested **two** ways through which water sources can be kept clean.

   (i)_____

   (ii) _____
6. Why is it good to use clean containers to harvest water?

   _____
7. Apart from protecting water source, mention any **two** other importance of fencing water source.

   (i)_____

   (ii) _____

Rain

Rain is water falling in separate drops from clouds.

Rainfall is the amount of rain water that falls in a certain area at a certain time.

The measuring units of rainfall are millimetres (mm)

Experiment to show a water cycle (diagram)

Things to use

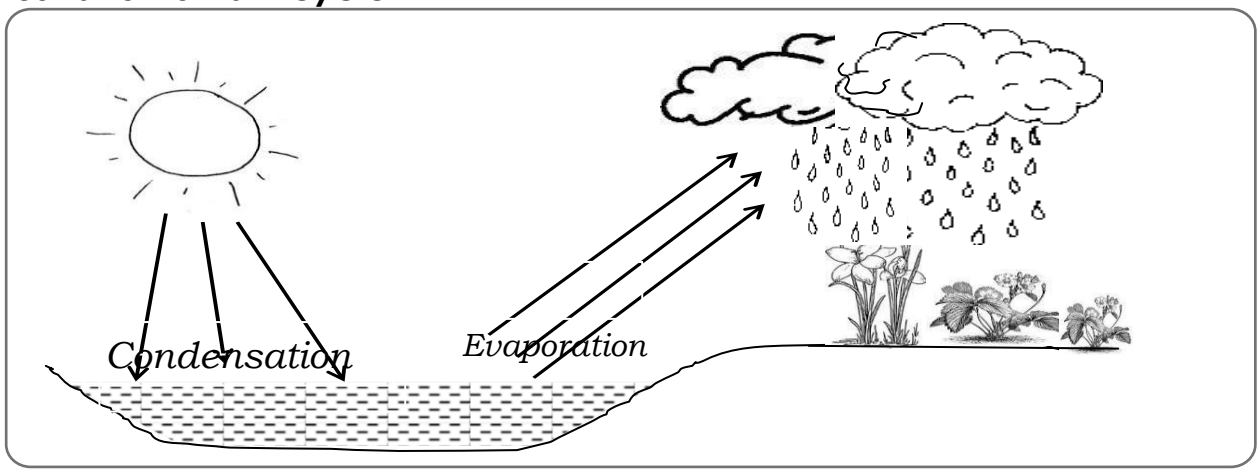
1. Kettle
2. Source of heat
3. Water
4. Cold container

Comparison of the experiment to the rain cycle:

Kettle-water body

Fire-sun

Illustration of rain cycle



The sun **heats** the water.

Water **evaporates** to form water vapour.

Water vapour rises and **condenses** to form nimbus clouds.

When the clouds become heavy, they fall as rain.

Note:

Water cycle is a process by which rain is formed.

The water cycle involves the following process:

1. Evaporation:

This is a process by which water changes to vapour.

2. Transpiration:

This is the process by which plants lose water to the atmosphere in form of water vapour through the stomata.

3. Condensation

This is the process by which vapour changes in to water.

Steps in the water cycle

- The sun heats the water body and plants.
- Evaporation and transpiration occur. (Evapotranspiration).
- Water vapour condenses to form clouds.
- When clouds are heavy, they fall as rain by gravity.

ACTIVITY

1. What is the use of sun in the rain cycle?

   _____

   _____

2. Which clouds give us rain?

   _____

   _____

3. Name the processes that take place in the rain cycle.

   _____

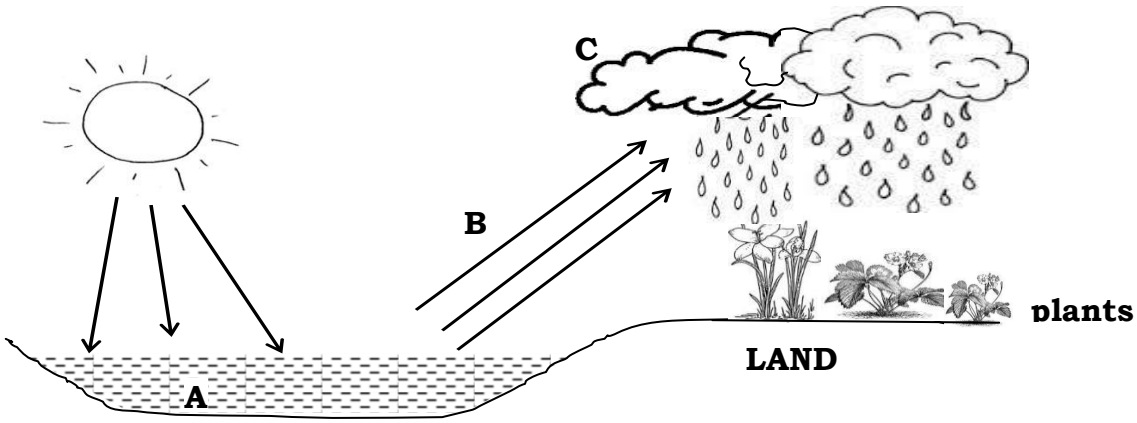
   _____

4. What is water cycle?

   _____

   _____

Below is a diagram of water cycle. Use it to answer the questions that follow.



(a) What name is given to the natural change shown above?

_____

_____

(b) Name the processes that take place at **B** and **C**.

B _____

C _____

(c) How are plants useful in the natural change above?

_____

_____

5. Name the element of weather marked with letter:

   (a) A:_____

   (b) D:_____

6. State the main source of heat in the water cycle.

   _____

   _____

7. Name the process by which rain is formed.

   _____

8. By what process do water changes to vapour?

   _____

   _____

Effects of rainfall

Rain is a condensed vapour in the atmosphere.

Effects of rain on the environment

1. Rain reduces temperature in the environment
2. Rain reduces dust.
3. Rainfall softens soil

Uses of rainfall

(a) Water for domestic activities
(b) Water for crop growing
(c) Water for photosynthesis in plants
(d) Helps in seed germination
(e) Water softens the soil
(f) Water cools the environment

Dangers of heavy rainfall

- Destruction of property like houses
- It causes floods
- Destroys crops
- Causes soil erosion
- It spoils road surfaces and bridges
- Lighting and thunder
- It spreads diseases e.g. water borne diseases
- It causes land slides

Solutions to the above problems

- By practicing better methods of farming
- By putting lightning conductors on the roofs
- Planting trees to act as wind breaks
- To avoid swamp drainage
- Tarmac the roads

Activity

1. What is rainfall?

   _____

   _____

2. Name the instrument used to measure the amount of rainfall.

   _____

3. Identify any **two** dangers of too much rainfall to farmers.

   (i)_____

   (ii) _____

4. State any **two** importance of rainfall to:

   (a) Crops in the garden

   (i)_____

   (ii) _____

   (b) The farmers.

   (i)_____

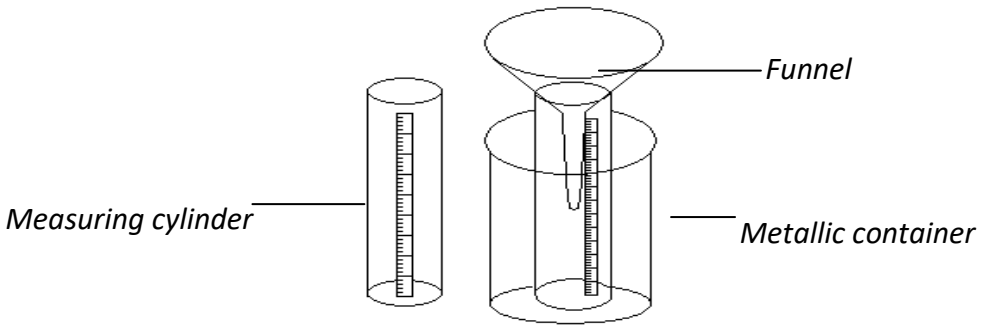
   (ii) _____

Measurement of rainfall

Rainfall is measured using a rain gauge.

A rain gauge is the weather instrument used for measuring rainfall.

Rainfall is measured by an instrument called a **rain gauge**



Rain gauge is supposed to be put in an open place.

Uses of different parts of a rain gauge

- ☑ funnel directs water into the bottle
- ☑ metal container prevents water from evaporating)
- ☑ water bottle collects the amount of rainfall received

Reasons why a rain gauge put in an open place

- To get the correct amount of rainfall received.
- To prevent obstruction of rain drops.

  The rain gauge should be raised 30cm above the ground to prevent running water from entering the measuring cylinder.

Reason why rainfall is measured in millimeters

To know how deep rain water has entered the ground

Activity

1. Give **two** effects of rain in the environment.
   (i)_____
   (ii) _____
2. Name the instrument used to measure rainfall.

   _____
3. State the function of a water bottle in the rain gauge.

   _____
4. State **one** use of the following components of a rain gauge.

(a) Funnel

_____

_____

(b) Water bottle

_____

5. Where a rain gauge should be placed?

   _____

   _____
6. Why is a rain gauge important to a farmer?

   _____

Types of clouds

A cloud is a condensed water vapour.

There are four main types of clouds.

(a) Stratus clouds

These are thick and grey covering large parts at the sky.

They are commonly dark grey and sometimes cause drizzles.

(b) Cirrus clouds

These are thin and wispy.

They appear at high altitudes.

They are the highest/ farthest clouds that appear like feathers.

(c) Cumulus clouds

These are big, dark clouds with white particles.

They look like cotton wool and have flat bases.

(d) Nimbus clouds

These are big, dark clouds they are associated with rain.

They don't have the white patches and flat base of the cumulus.

They bring steady rainfall

Types of clouds and the weather they form

Cloud	**Weather**
Cirrus	Sunny/windy
Stratus	Sunny/windy
Cumulus	Cloudy/rainy
Nimbus	Cloudy/rainy

Activity

1. What are clouds?

   _____

   _____

2. Name **any two** types of clouds.

   (i)_____

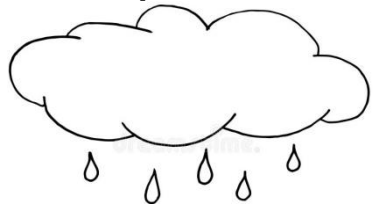
   (ii) _____

3. Which cloud appears at the highest altitude?

   _____

   _____

Below is the type of cloud and the weather condition it brings. Use it to answer questions 4 to 6.



4. Name the type of cloud above.

   _____

   _____

5. Mention any **one** condition of weather caused by the type of cloud above.

_____

_____

6. How is the above type of rainfall useful to the farmers?

_____

_____

7. Which type of clouds look like cotton wool?

_____

_____

8. Identify the type of clouds that are friendly to farmers.

_____

_____

Effects of clouds

- Bring rain (nimbus)
- Cool temperatures (cumulus/nimbus)
- Shield us from strong sun heat
- Thick clouds trap heat energy causing rise in temperature (cumulus)
- Shade off sunlight causing darkness
- Can contain hailstone which is destructive.
- Can result into lighting.

Dangers of clouds

- Clouds cause lightning
- Clouds bring heavy rainfall which cause floods
- Clouds cause accidents to people who use air transport.

Activity

1. Mention **two** effects of clouds to the environment.
   (i)_____
   (ii) _____
2. Give **two** dangers of clouds to people.
   (i)_____
   (ii) _____

3. What term is used to mean the amount of water vapour in the atmosphere?

   _____

   _____

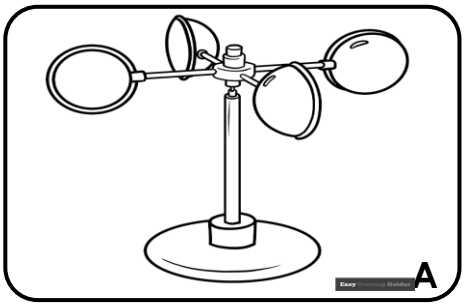
4. Name the weather instrument used for measuring:
   (i) Humidity:

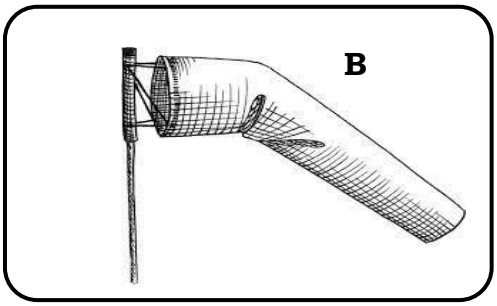
   _____

   (ii) Rainfall:

   _____

The diagram below shows some wind instruments.





a) Name the instruments shown above.

(i) Instrument A_____

(ii) Instrument B_____

b) Which element of weather enables the instruments above to work?

_____

c) How are the above instruments similar?

_____

_____

5. Use this picture to answer the questions that follow.

a) Name the weather condition below.

_____

_____

b) State **two** activities done in/ during this condition.

(i)_____

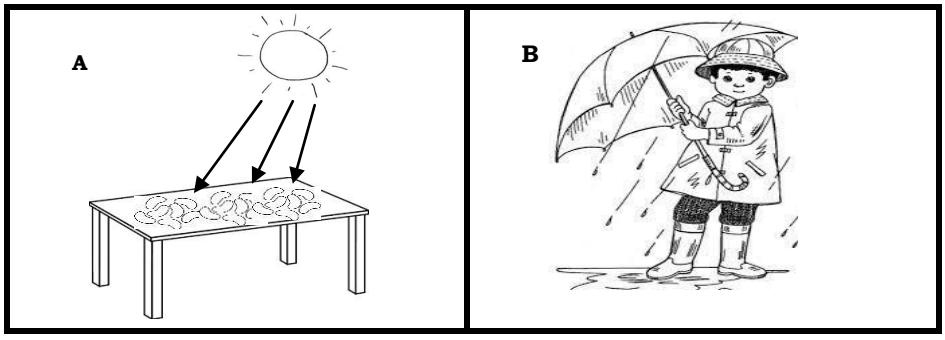
(ii) _____

c) Mention **two** ways guarding against this bad weather.

(i)_____

(ii) _____

6. <u>The figure below shows a weather chart. Use it to answer questions that follow.</u>



(a) Identify the types of weather shown in **A** and **B**.

(i) A _____

(ii) B: _____

(b) Give **one** way in which the type of weather in **B** is useful to a crop farmer.

_____

_____

(c) State **one** way of protecting ourselves from weather **B**.

_____

_____