GOLDEN HEARTS SCHOOL
PRIMARY THREE SCIENCE LESSON NOTES 2021
TERM ONE

SOIL

What is soil?

Soil is the top layer of the earth's surface in which plants grow.

Components of soil

- Air
- Water
- Living organisms
- Mineral salts

Importance of each component of soil

➢ Air e.g. nitrogen	Improves on soil fertility.
	Prevents the rotting of plant roots
➢ Water	Softens the soil
➢ Living organisms	helps in soil aeration and formation
➢ Mineral salts	Improves on soil fertility

What is soil aeration?

Soil aeration is the free movement of air in the soil.

Formation of soil

How is soil formed?

- By weathering of rocks
- By decomposition of organic matter.

WEATHERING

Weathering is the process by which rocks are broken down to form soil.

Mention any 7 examples of living organisms that can break rocks into small pieces.

- Termites
- Rats
- Squirrels
- Earth worms
- Some insects
- Rabbits
- Man

DECOMPOSITION

What is decomposition?

Decomposition is the process by which living things die and decay.
Which component of soil is formed by decomposition?
Humus

Types of soil
- Loam soil
- Clay soil
- Sand soil

Loam soil
List down the characteristics of Loam soil
- It is a mixture of sand and clay.
- It is dark brown in colour
- It is the best soil for growing crops
- It contains a lot of humus in it.
- It has moderate drainage

Structure showing the arrangement of particles in loam soil

Why is loam soil said to be the best soil for growing crops?
- ✓ It contains a lot of humus.
- ✓ It is fertile

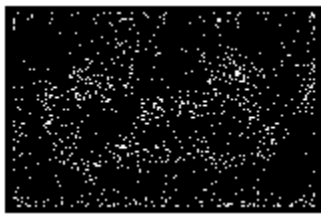
What is humus?
This is the black material formed when plant and animal die and decay.

How is humus formed?
By decomposition of dead plants and animals

List down the importance of humus
- It improves on soil fertility
- It binds soil particles together.

Clay soil
List down the characteristics of clay soil
- It is heavy, thick and difficult to dig.
- It is grey in colour
- Its particles are held together
- It keeps water for a long period of time

Structure showing the arrangement of particles in clay soil



Why is clay soil called water logged?
It holds water for a long time

Where clay soil is commonly found?
In Swamps

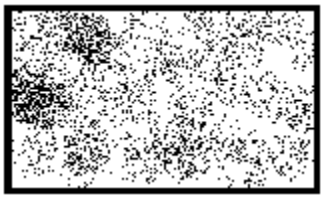
Why is clay soil not good for plant growth?
It has a lot of water in it that can make some crops rot. Clay soil is water logged.

State any two uses of clay soil.
- For modeling
- For painting / Decoration

Why is clay soil used for modelling?
Clay soil has fine and sticky particles when wet

Sand soil
List down the properties of sand soil
- It is loose, light and easy to dig
- Sand soil has widely spaced particles
- It contains a lot of air spaces and allows water to pass through it.
- It is not good for growing crops.
- It has poor rate of capillarity

Structure showing the arrangement of particles in sand soil



Why does sand soil loose water easily?
- Sand soil has widely spaced particles

Give any two uses of sand soil.
- For building
- Making concrete blocks
- For putting out fire.
- For making glasses

Where is sand soil commonly found?

- Along lake shores
- In some swamps.
- In some livers

List down the uses of soil

- Soil is used for growing crops.
- Soil is used for building
- Soil is used for painting / decoration
- Soil is used for making pots.
- Sand soil is used for making glasses
- Soil is used for making bricks
- Soil is sold to get money (source of income)
- Homes for some insects and worms.

Soil profile

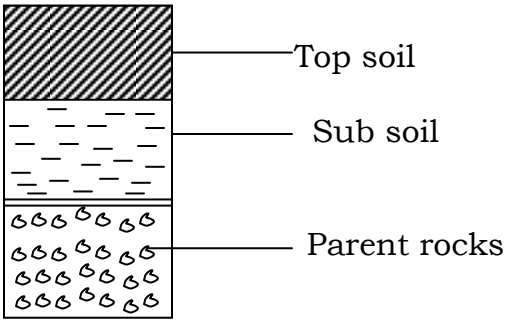
What is soil profile?

This is the vertical arrangement of soil layers.
The arrangement of soil layers from top to bottom.

List down the different layers of soil

- Top soil
- Sub soil
- Parent rocks.

Draw a structure to show the vertical arrangement of different layers of soil.



Qualities of each layer of soil

Top soil

- It is good for plant growth because it contains a lot of humus

Sub soil.

- It is poor for plant growth.

Soil texture

This is the smoothness or roughness of soil

Which type of soil has;

i. **Rough texture?**
   Sand soil
ii. **Smooth texture?**
   Clay soil

Soil erosion

What is soil erosion?

Soil erosion is the removal of the top soil by its agents.

Agents of soil erosion

- Strong wind
- Animals.
- flowing water

Causes of soil erosion

- Bush burning]
- Deforestation
- Over stocking
- Overgrazing
- Over cultivation

Types of soil erosion

- Sheet erosion
- Rill erosion
- Splash erosion
- Gully erosion
- River bank erosion

Ways of controlling soil erosion

- By planting trees and grass
- By terracing in hilly areas
- By mulching
- By cover cropping
- By strip cropping
- By contour ploughing
- By tarmacking the compound

Dangers of soil erosion

- It can lead to soil exhaustion
- It spreads weeds
- It destroys crops and properties.
- It destroys roads.
- Leads to silting.

Soil exhaustion

Is the loss of soil fertility

Causes of soil exhaustion

- Soil erosion
- Dumping of polythene bags in the soil
- Over cultivation (Growing crops without giving land a resting period.
- Mono cropping (Growing the same crop on the same pieces of land season after season.
- Bush burning
- Leaching
- Over use of agrochemicals

Effects of soil exhaustion

- Plants can not grow well.
- The farmer gets little\poor yields / harvests.

How can farmers control soil exhaustion?

- By bush fallowing
- By practising crop rotation
- By practising mixed farming
- By using manure
- By mulching
- By adding fertilizers in soil
- By planting trees.

Soil Conservation

What is soil conservation?

This is the way of maintaining soil fertility.

Ways of conserving the soil.

- By practising crop rotation
- By practising mixed farming
- By planting trees to prevent soil erosion
- By bush fallowing
- By manuring
- Avoid dumping polythene bags in soil

Soil fertility

What is soil fertility?

This is the ability of the soil to support plant growth.

Ways of improving soil fertility

- ✓ By adding manure
- ✓ By mulching
- ✓ By practising bush fallowing
- ✓ By practising crop rotation

Crop rotation

What is crop rotation?
This is the growing of different type of crops on the same piece of land season after season.

Examples of crops that can be crop rotated.
Beans Maize Sweet potatoes

Why are legumes included in the crop rotation cycle?
To improve on soil fertility

Advantages of crop rotation
- It improves on crop yield or harvest.
- It improves on soil fertility.
- It controls soil erosion
- It controls pests and diseases

How does crop rotation control pests?
By breaking the life cycle of pests

Mulching
Is the covering of top soil with dry plant materials

What are mulches?
These are dry plants materials used for covering the top soil.

Examples of mulches
- Dry leaves.
- Dry grass.
- Coffee husks.
- Banana fibre.

Why do farmers use dry plant materials to cover their gardens?
- ✓ Dry plant materials can not grow into weeds.
- ✓ They allow water to pass through them.

Advantages of mulching
- It keeps the soil moist.
- It controls soil erosion
- It improves on soil fertility
- It controls growth of weeds

Disadvantages of mulching
- Mulches can easily catch fire and burn crops
- Mulches can hide pests
- Some mulches can grow into weeds

CHANGES IN THE ENVIRONMENT.

What is environment?
Environment is man and his surrounding.

Types of changes in the environment.
i. Natural changes
ii. Artificial changes (man made changes)

What are natural changes?
These are changes that occur on their own.

Examples of natural changes
- ✓ Drought
- ✓ Floods
- ✓ Earth quakes
- ✓ Land slides
- ✓ Storms
- ✓ Thunder and Lightning
- ✓ Volcanic eruption
- ✓ Hailstones

Effects of natural changes.
- ✓ Leads to destruction of crops
- ✓ Leads to death
- ✓ Destroy property
- ✓ causes soil erosion
- ✓ Leads displacement of people and other animals
- ✓ Lead to spread of epidemic diseases

Artificial changes
What are artificial changes?
These are changes caused by human activities.

Examples of artificial changes
i. Construction of roads
ii. Deforestation
iii. Construction of bridges
iv. Afforestation
v. Construction of houses
vi. Industrialization
vii. Making of bricks
viii. Charcoal burning
ix. Swamp drainage
x. Bush burning
xi. dumping of wastes

Effects of artificial changes

- Brick making destroys the soil
- Charcoal burning can lead to air pollution
- Bush burning leads to soil erosion
- Deforestation may lead to drought.

Ways of managing changes in the environment

- ✓ by planting more trees
- ✓ by protecting swamps
- ✓ avoid bush burning
- ✓ carryout proper farming practices
- ✓ control soil erosion
- ✓ educate people about dangers of cutting trees
- ✓ avoid throwing things that do not rot in soil

ENVIRONMENT AND WEATHER IN OUR SUBCOUNTY / DIVISION

Environment is man and his surroundings.

Types of environment

(a) physical environment[made up of nonliving things]
(b) biological environment [made up of living things]

What is biological environment?

This is the type of environment that is made up of living things.

What are living things?

These are things which have life.

Examples of living things.

- ✓ Animals
- ✓ Plants
- ✓ Insects
- ✓ birds

Name the two groups of living things.

- ✓ Plants
- ✓ Animals.

Physical environment

This is the type of environment that is made up of non-living things like stone, soil, air, water etc.

Components of the environment.

- Air
- Water
- Land[soil]
- rocks

- Plants
- Animals
- Buildings

Examples of the living components of environment

- ✓ Plants
- ✓ Animals

Examples of the nonliving components of environment

- ✓ Air
- ✓ Water
- ✓ Soil
- ✓ Buildings
- ✓ rocks

Air

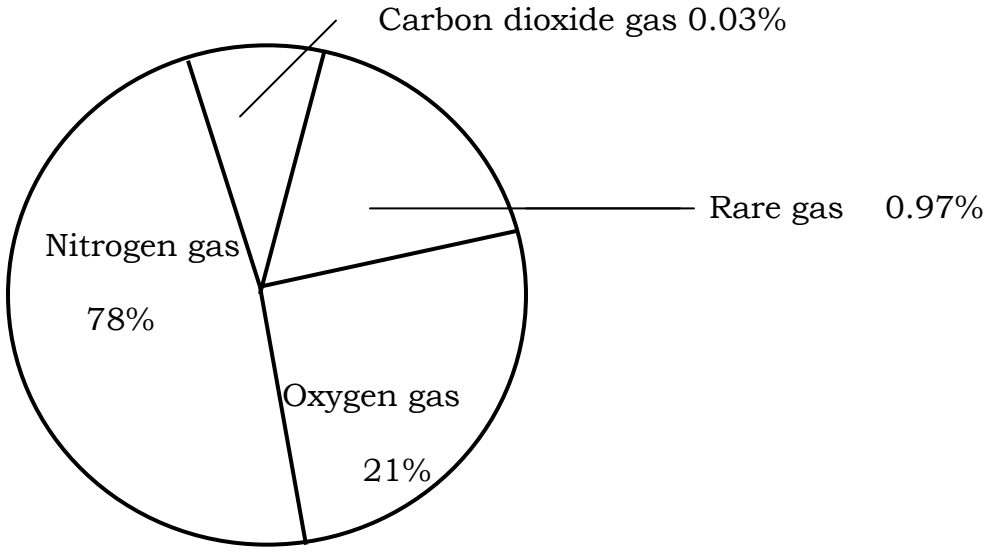
What is air?

Air is the mixture of gases.

Components of air.

- ✓ Oxygen
- ✓ Nitrogen
- ✓ Carbon dioxide
- ✓ Rare gases.

Draw a structure showing the percentage of each component of air in the atmosphere.



Name the components of air that occupies the largest percentage.

Nitrogen

Name the components of air that occupies the smallest percentage.
Carbon dioxide
Which component of air is needed by plants to germinate.
Oxygen

Which component of air is needed by plants to make their own food.
Carbon dioxide

Name the component of air needed by plants at night.
Oxygen

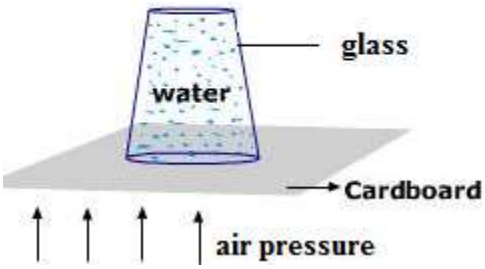
State the component of air needed in
(i) **Preserving soft drinks** Carbon dioxide
(ii) **Burning** Oxygen
(iii) **Rusting** Oxygen
(iv) **Fire extinguisher** Carbon dioxide

Properties of air
Air has weight
Air occupies space
Air exerts pressure
Air can be compressed.

An experiment to show that Air has weight.

An experiment to show that Air occupies space

An experiment to show that Air exerts pressure



Uses of air

- Air supports burning
- Moving air is used for winnowing
- Air is used to put out fire
- Moving air cools our bodies and some machines
- Carbondioxide is used to preserve soft drinks.
- Carbondioxide helps plants to make their own food.

Dangers of air

- Strong wind destroy buildings
- Strong wind can destroy our crops
- Moving air spread air borne diseases like flue, cough and mumps.
- Strong wind raises dust.
- Affects water transport by causing accidents

Weather

What is weather?

Weather is the state of the atmosphere at a given time

Elements of weather or weather makers

- ✓ Rain
- ✓ Clouds
- ✓ Wind
- ✓ Temperature
- ✓ Humidity

Types or conditions of weather

Rainy weather
Cloudy weather
Windy weather
Sunny weather

Wind

Wind is air in motion or is the moving air.

Uses of wind

- Wind is used for winnowing
- Wind helps to drive wind mills to produce electricity [wind energy]
- Wind moves boats
- Wind drives away the bad smells.
- Playing games like flying kites.
- Wind helps in seed dispersal and pollination

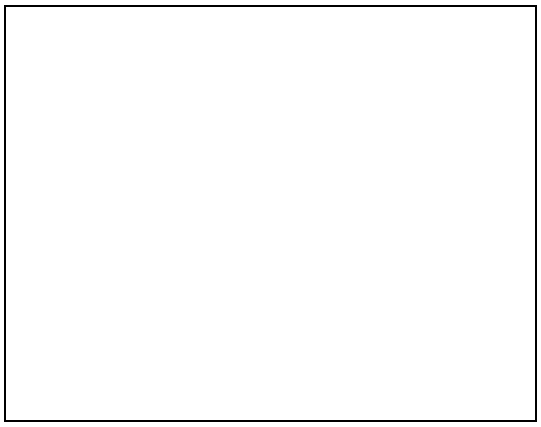
Dangers of wind

- Strong wind can destroy buildings.
- Strong wind can destroy crops.
- Wind is an agent of soil erosion
- Wind can spread air borne diseases
- Wind can raise dust.

Name the weather instrument used to measure the speed of wind.

Anemometer

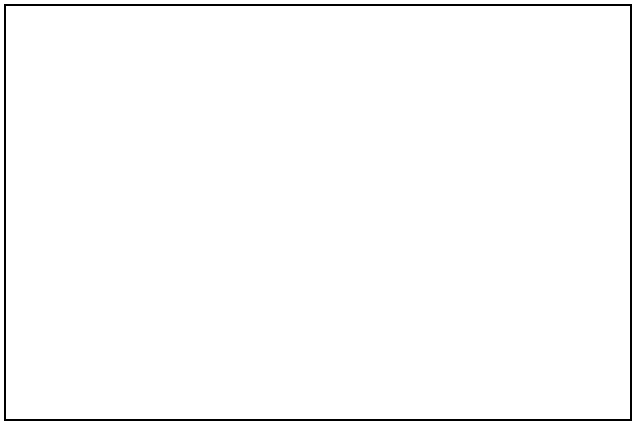
Draw a structure showing the anemometer.



Name the weather instrument used to show the direction of wind

Wind vane.

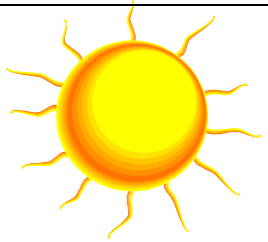
Draw a structure showing a wind vane.



Name the weather instrument used to show the strength of wind.
Wind sock.

Draw a diagram showing the structure of a wind sock.

The sun
Draw the structure of the sun.



- This is the main natural source of light and heat.
- The sun raises from the _____ and sets in the _____

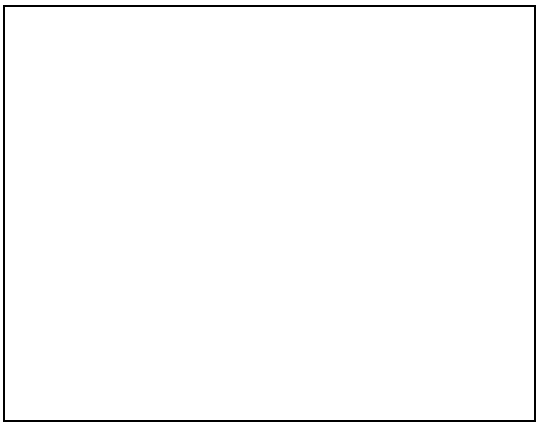
Uses of the sun to man
- The sun provided us with light that helps us to see.
- The sun provides us with heat.
- It dries our harvested crops.
- It helps in rainfall formation.
- It kills germs (heat)
- The sun helps our skins to make vitamin D.

Uses of the sun to plants.
- Plants use sunlight to make food.

Dangers of the sun

- It dries up waterbodies
- It destroys crops
- It makes the soil hard for farmers to cultivate

A diagram showing the structure of sunshine recorder



Shadow

What is a shadow?

A shadow is a region of darkness formed when light is blocked by an opaque object.

What are opaque objects?

Opaque objects are objects that do not allow light to pass through them.

Examples of opaque objects.

- ✓ Man
- ✓ Trees
- ✓ Stones
- ✓ Houses
- ✓ Mountains
- ✓ Hills

The position of the shadow

A shadow is always on the opposite side of the sun.

For example;

i. If the sun is in East, the shadow is in the West.
ii. If the sun is in the West the shadow is in the East.

Draw the shadow for the following:

When is the shadow shorter than the object?
At mid-day

When is the shadow longer than the object.
Late in the evening and early in the morning

Uses of the shadow
- It helps to show directions.
- It helps to tell time.
- They provide shade.

Clouds
What are clouds?
This is a mass of condensed water vapour floating in the air.

How are clouds formed?
By condensation of water vapour in the atmosphere

Name the four types of clouds.
- ✓ Nimbus clouds
- ✓ Cirrus clouds
- ✓ Stratus clouds
- ✓ Cumulus clouds

Nimbus clouds

What is the colour of the Nimbus clouds?
They are dark grey.

Name the nearest clouds to the earth's surface.
Nimbus clouds

How are Nimbus clouds important to farmers.
Provide water to crops

Name the farthest clouds in sky.
Cirrus clouds

Give any three importance of clouds
- Nimbus clouds provide rain
- They protect us from direct sunshine
- They keep the earth warm at night.

Dangers of clouds

- ✓ They cause lightning.
- ✓ They can cause plane to crush
- ✓ They can cause heavy storms.
- ✓ They make air transport difficult.

Rain

What is rain?

This is water falling in form of droplets from the sky.

How is rain formed?

The sun heats the water body.
The heated water evaporates.
The vapour cool down to form clouds.
The clouds melt and fall in drops.

A water cycle

This is the way rain is formed

A diagram showing water cycle

Questions;

1. **Name the processes that take place during rain formation**
   - ✓ Evaporation
   - ✓ Condensation
   - ✓ transpiration
2. **what is the role of the sun in the water cycle**
   To heat the water body

An experiment to show how rainfall is formed

Where does rainfall go after it has rained?

- ✓ In the soil
- ✓ In water bodies.

Water bodies

What are water bodies?

Water bodies are sources of water.

List down the examples of water bodies

- ✓ Lakes
- ✓ Rivers
- ✓ Oceans
- ✓ Seas
- ✓ Springs
- ✓ wells
- ✓ Boreholes

Natural sources of water.

What are natural sources of water?

These are sources of water that occur on their own.

Examples of natural sources of water

- ✓ Rain
- ✓ Lakes
- ✓ Rivers
- ✓ Seas
- ✓ Springs
- ✓ Wells.

Name the main natural source of water:

Rain

Artificial sources of water

What are artificial sources of water?

These are sources of water that are made by man.

Examples of artificial sources of water

- Tanks
- Boreholes

Containers used to store water.

- Jerry cans
- Tank
- Drum
- Bucket
- Basin
- Source pan

Ways of managing water sources

- By slashing around the water sources.
- By digging around the water sources
- We should avoid dumping wastes near water sources.
- We should build latrines at least 30 m away from a water source to avoid water contamination.

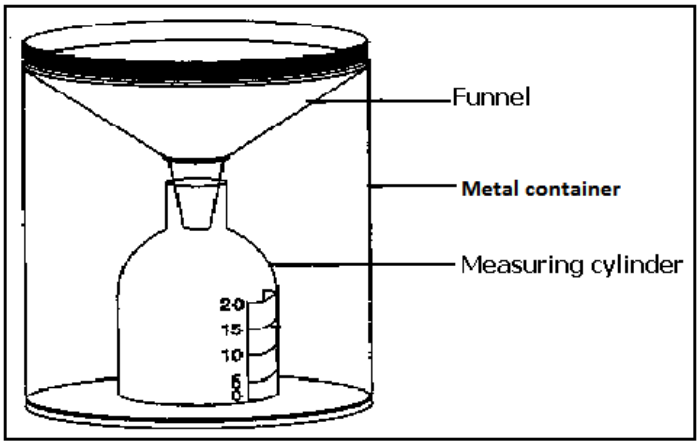
Uses of rain

- Rain provides us with water for drinking.
- Rain water softens the soil for plant growth.
- Rain cools the temperature of the day.
- Rain provides water for plant growth
- Rain water is used in domestic activities like bathing, drinking and washing.

Dangers of too much rain

- Too much rain can spoil roads.
- Too much rain can cause floods.
- Too much rain can spoil / destroy our crops
- Too much rain can kill people and animals
- Too much rain can destroy bridges.

Draw a diagram showing the structure of a rain guage.



Why is a rain gauge put in an open space?

To avoid blocking rain droplets.

In which units are rainfall measures:

Millimeters

Temperature

What is temperature?

Temperature is the degree of hotness or coldness of an object.

Name the instrument used to measure temperature.

A thermometer

List down the types of thermometer

- Clinical thermometer.
- Six's thermometer (Minimum and maximum thermometer)

A clinical thermometer

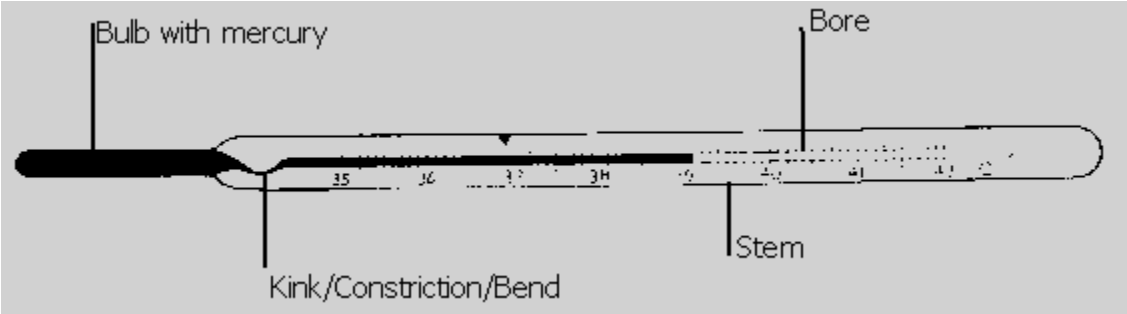
What is another name of a clinical thermometer?

It is doctor's thermometer

State the function of a clinical thermometer.

To measure the body temperature of sick person

Draw a diagram showing the structure of a clinical thermometer.



Functions of the parts

Part	**Function**
Kink	To prevent the backward flow of mercury before the reading is taken.
Stem	To protect the bore.
Bulb	To store mercury

Why do doctors shake the thermometer before measuring temperature of another person?

- To let the mercury go back to the bulb (0^0).
- To reset the thermometer

Name the two liquids used in a clinical thermometer.

- Mercury
- Alcohol

Why is mercury commonly used in thermometer?

- It a good conductor of heat.
- It does not stick on the glass wall.
- It is easily seen
- It expands easily.

In which units is temperature measured?

Degrees

What is the normal body temperature of a human being?

37^0C or 98.4^0F

Name the two scales of a clinical thermometer.

- Centigrade scale (^0C) [Celsius]
- Fahrenheit scale (^0F)

List down any three body parts where a clinical thermometer can be placed.

- Arm pit
- Under the tongue
- In the anus

Humidity

What is humidity?

Humidity is the amount of water vapour in the atmosphere.

Name the weather instrument used to measure humidity

A hygrometer (Wet and dry bulb)

Draw the structure of a hygrometer.

Note:

- When there is a lot of water vapour in the atmosphere it becomes damp or wet.

- The wet bulb measures temperature of water vapour
- The reading from the dry bulb thermometer measures the temperature of air.

A Stevenson's screen

Why is a Stevenson's screen painted white?

- To reflect light and heat

State the function of a Stevenson's screen.

To keep the delicate weather instruments like;

- a barometer
- a thermometer
- a hygrometer