GOLDEN HEARTS SCHOOL

PRIMARY THREE SCIENCE LESSON NOTES 2019

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**

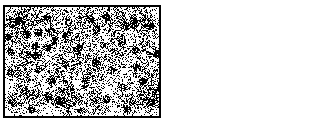
* Loam soil
* Clay soil
* Sand soil

**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

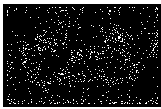
* It improves on soil fertility
* It binds soil particles together.

**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?

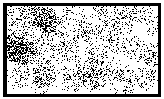
Clay soil has fine and sticky particles when wet

**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.**

Top soil

Sub soil

Parent rocks

**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;**

1. **Rough texture?**

Sand soil

1. **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.**

1. Natural changes
2. 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**

1. Construction of roads
2. Deforestation
3. Construction of bridges
4. Afforestation
5. Construction of houses
6. Industrialization
7. Making of bricks
8. Charcoal burning
9. Swamp drainage
10. Bush burning
11. 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**

1. physical environment[made up of nonliving things ]
2. 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.**

Carbon dioxide gas 0.03%

Rare gas 0.97%

Nitrogen gas

78%

Oxygen gas

21%

**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**

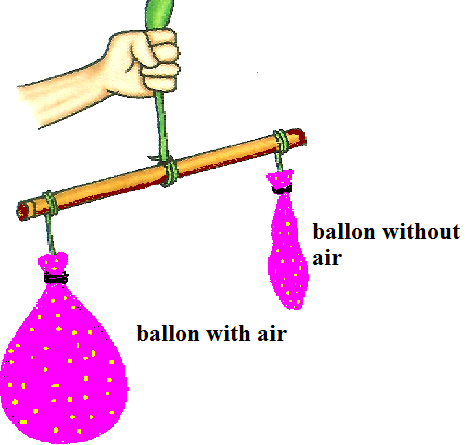
Air has weight

Air occupies space

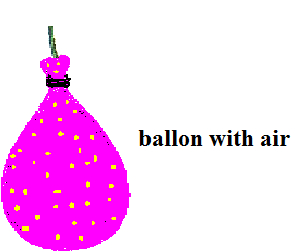
Air exerts pressure

Air can be compressed.

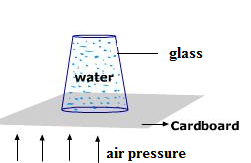
**An experiment to show that Air has weight.**



**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**

|  |
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**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;**

1. If the sun is in East, the shadow is in the West.
2. 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

1. **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.

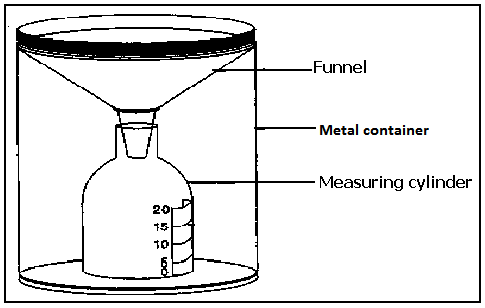
**Uses of rain**

* 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**

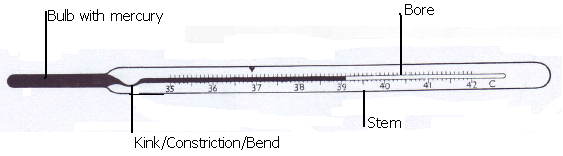
What is another name of a clinical thermometer?

It is doctor’sthermometer

**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 (00).
* 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?**

370C or 98.40F

**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