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PRACTICAL APPROACH TO THE TEACHING OF EARTH AND SKY, ROCKS AND SOIL

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USING TRANSPARENCIES AND OVERLAYS TO TEACH EARTH

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T H E E A R T H

INTRODUCTION

The four concepts considered in this workshop fall under the topic in sciences known as the earth science. Earth science deals with materials of the earth (soil, rocks, water, wind, sun, moon, stars, air and space etc), possible changes on these materials, and the relationship of earth to other bodies of the universe.

In this demonstration we are going to specifically look at studies on earth in relation to:

- Other planets;
- Its position in the solar system;
- Its size and shape;
- Its motion and effects on time season;
- Its surface and the effect on living things;
- The relationship of earth to the soil and soil's benefit to man.

The concept "Earth" in science is usually used to mean the planet which we inhabit. It is the third in order from the sun where the sun occupies the centre of our solar system. /T1/ The earth has been estimated to be between four and five billion years old (Stanger et al, 1974). It is the only planet on which living things are known to exist. The earth is surrounded by a dense ocean of air which protects us from the harmful radiation given off by the sun /T2/. This air provides us with oxygen, a gas which is required by all living things. Earth is also the only planet out of the nine major planets known to possess oceans and most of the moisture found in the air comes from these oceans.

THE SHAPE AND SIZE OF THE EARTH

A Greek mathematician and an astronomer Eratosthenes studied the earth and calculated its circumference. He assumed that the earth is spherical in shape and that its circumference is about 15,281.25 km. Later on an estimate of 15,555.62km was given as the measurement of the earth. It is also said that because the earth rotates so rapidly on its axis there is some strain on its sides which has caused it to slightly bulge near the equator, thereby giving it a slight flattening at its poles. This has caused the earth to look like a distorted sphere. Of recent, it has been observed that the earth is actually pear shaped.

/T3/

THE EARTH'S ROTATION AND REVOLUTION

When the sun crosses the plane of the earth's equator, we have an equal day and night all over the earth. This occurs twice in its full rotation. Around March 21st, when this occurs it is known as vernal or spring equinox and when it occurs around september 22nd it is called autumnal equinox.

The earth has one natural satellite and this is the moon. This is the body which revolves around the earth monthly. It therefore accompanies the earth in its annual revolution about the sun. All the planets revolve around the sun in paths known as orbits. This spinning motion is called revolution and the time it takes one planet to make a complete revolution on its orbit represents a year on the planet. The earth's period of revolution is therefore 365.256 days measuring a mean

distance of 58,100,000km from the sun /T4/. During the earth's revolutional course, changes in time and seasons are brought about. This explains why we have day and night, winter and summer, autunm and spring /T5/.

EARTH & RELATIONSHIP TO SOIL

The concept of EARTH more specifically can also be used to represent the solid matter of this planet, the dryland on the ground on which we plant crops and build houses. In this usage, the earth is therefore seen as the softer part of the dryland as distinguished from the rocks. This distinguished portion of the earth's surface is known as the soil. It is made up of well developed system of inorganic (that which characterizes non living) and organic (that which characterize living things) materials.

The soil exists in layers and this constitutes its profile. It is worth noting that the climate of an area has a lot to do with the type of soil formed. Soil could therefore be formed as the conditions of an area cause the weathering of rocks and vegetation decay. /T6/

Three forces are necessary for rock disintegration namely physical weathering, chemical weathering and biological weathering. The factors of the physical weathering include water, temperature, wind and ice and they disintegrate the physical nature of the rock. The activities of plants and animals on rock disintegration constitute the biological means of soil formation while chemical weathering deals with the chemical disintegration of rocks and has the following as agents solution,

carbonation, oxidation, hydration and dehydration. These factors break the rocks into five particles called the soil with layers depending on the age of development. The first two layers experience active accummulation of particles and constant drainage and erosion. Crops are also grown on the topmost layer of the soil. The growth and development of the crops depend on the nutrient content of the soil and other soil characteristics. Due to varying support of soil to crops, soil consistency texture and structure, soil is classified into loamy soil sandy soil and clayey soil depending on the varying concentrations. of sand, silt and clay in a particular soil. Each of these types of soil can be improved with the use of manure which can be an organic or inorganic manure. Organic manure are from the decomposition of crops and animal products while inorganic chemical fertilizers. We therefore depend on soil for crop and animal production for man's survival on the planet earth.

From this short discussion it is vividly demonstrated that the earth in which we live is very important. Every materials of the earth relates with one another and man derives some benefits. There is still much to be known about the planet Earth and its activities on the surface. From now onward, it is good to pay more attention to the "Earth," do not toy with it, do not do things that can destroy the earth. It is a very valuable gift to man.

COMPLETION QUESTIONS TO TEST UNDERSTANDING

1. How far is the planet Earth from the sun?

2. What name do you give to the paths used by the planets as they revolve around the sun?

3. What is the meaning of rotation?

4. Around what date will the earth be 59,062,500 km from the sun?

5. Around what time of the year will the earth be at 57,187,500 km from the sun?

6. Who was Eratosthenes?

7. What is the difference between autumnal equinox and vernal equinox?

8a) What is the season when the earth is at the East position to the sun?

b) What is the season when the earth is at the South position to the sun?

9. What is the usefulness of oxygen to.

a) man

b) plants

10. What is the estimated age of the planet.

11. Name the different types of soil that you know.

i) _____

ii) _____

iii) _____

12. What material can one use to improve the nutrient/enrich the soil for planting.