SUBJECT: GEOGRAPHY **CLASS: SS1**

SCHEME OF WORK

WEEK	TOPIC
1	Introduction to Geography: Meaning, Nature, Scope and Value of Geography.
2	The Solar System: The Universe, The Planets, The Earth.
3	The Earth as a Planet; Shape and Size of the Earth, Proof of the Earth's Sphericity. The Movement of the Earth: Rotation & Revolution.
4	Latitude and Longitude: Definition, Uses, Similarities & Differences, Great and Small Circles.
5	Latitude and Longitude: Standard Time Zone, Calculation of Distances, Local Time, International Date Line (IDL).
6	The Structure of the Earth: The Outer Zone.
7	The Structure of the Earth: The Interior Zone.
8	Rocks of the Earth: Types and Characteristics.
9	Basic Concept of Geographic Information System (GIS).
10	Major Land Form Features: Types of Land Forms, Mountain.
11	Revision.

REFERENCE

- Essential Geography for Senior Secondary Schools by O.A. Iwena.

WEEK ONE

INTRODUCTION TO GEOGRAPHY: MEANING, SCOPE AND VALUE

MEANING OF GEOGRAPHY

The word Geography is derived from the Greek word 'Geo' meaning the earth, and 'graph' which means description. Geography can therefore be defined as the description of the earth. However, Geography does not only describe the surface of the earth and its features. It also investigates the inter-relationship between man and his environment. Hence Geography can also be referred to as the study of people, their activities, places and physical things within the earth.

Geography deals with the study of different people in different locations of the earth including their activities like agriculture, mining, trading, fishing, manufacturing, construction, etc. Geography also relates with the different peoples of the world, their occupations, cultures, ways of dressing, religion, etc In addition, Geography involves the study of physical things within the earth such as rocks, mountains, plains, valleys, rivers, oceans, weather, rainfall, soils, vegetation, etc.

SCOPE OF GEOGRAPHY

Geography is a social science subject which deals with the study of man, his activities and his environment. Its relevance cuts across many other subjects like Economics, Agricultural Science, Government, History, etc. It is concerned with the study of the size, shape and movement of the earth and other heavenly bodies, landmass, bodies of water, climate, vegetation and events in different places of the world. It also deals with the spatial distribution of animal and natural resources as well as human activities.

EVALUATION QUESTIONS

1. What is Geography?
2. The Greek word 'Geo' means what?
3. Explain the scope of geography.

VALUE OF GEOGRAPHY

The value of geography or its importance include the following:

1. It enables man to have a better understanding of his environment.
2. Geography raises issues, problems and solutions vital to modern society.
3. It consists of knowledge of the world around us i.e it enables us to study the ways of lives of other people in other parts of the world.

4. A well trained geographer can perform many vital roles in the politics and socio-economic sector of the society. He can use his geographical knowledge in such areas as urban, economic, rural or regional planning.
5. Geography helps us to understand some other related topics in physics, chemistry, biology, economics, history, mathematics e.t.c.
6. It enables us have a better understanding of physical things around us such as vegetation, climate, rivers, soil, oceans, mountains e.t.c.
7. It enables us to choose a career from which we can earn a living.

EVALUATION QUESTION
What are the values of Geography?

GENERAL EVALUATION
1. What is Geography?
2. Explain the scope of Geography.
3. What are the importance of Geography in our society?
4. 'Geo' in the word geography means what?
5. The capital of Lagos state is _____.

READING ASSIGNMENT
Essential Geography, O.A. Iwena, Pages 1-2.

WEEKEND ASSIGNMENT
1. _____ is defined as the description of the earth. (a) Physics (b) Agriculture(c) Geography
2. One of the following is wrong about Geography (a) It helps us to study physical things around us (b) it helps us to study temperature and rainfall of places only (c) it enables us to study the way of life of other people in other parts of the world
3. Geography is a social science subject which deals with the study of (a) plants and animals (b) man and his environment (c) crop planting and animal rearing
4. Geography cuts across the following other fields of human study except (a) Economics (b) Government (c) Music
5. The word "Geo" in Greek means (a) describe (b) power (c) earth

THEORY
1. Write the capital of the following states in Nigeria (i) Ebonyi (ii) Plateau (iii) Ogun.
2. State two importance of geography.

WEEK TWO
THE SOLAR SYSTEM
Solar system is the description of the position of the earth and other planets in relation to the sun. The solar system comprises of the sun and the nine planets. All the planets revolve round the sun in "elliptical orbits".

The Universe: The universe is made up of many heavenly bodies, group of stars form clusters which are known as galaxies or nebulas. Our local groups or galaxy i.e the earth galaxy is known as 'The Milky Way'. It contains twenty seven galaxies.
A satellite is a smaller body which moves round a planet. The moon is the natural satellite of the earth.

Below is a summary of the components of the Solar System

Planets	Number of satellites	Distance from sun in Km	Years it takes to complete revolution
Mercury	None	57,600,000	88 days
Venus	None	107,200,000	225 days
Earth	One	148,800,000	365 days
Mars	Two	227,200,000	687 days
Jupiter	Twelve	772,800,000	11.9 years
Saturn	Nine	1,417,600,000	29.5 years

Uranus	Five	2,854,400,000	84 years
Neptune	Two	4,468,800,000	164.8 years
Pluto	None	5,850,000,000	247.7 years

EVALUATION QUESTIONS:

1. What is a solar system?
2. What are Galaxy, Satellite and Orbit?

OTHER IMPORTANT SPECIFICATIONS OF THE NINE PLANETS

MERCURY

1. This is the smallest planet.
2. It is the closest planet to the sun.
3. It is the hottest planet being the closest to the sun.
4. It contains no living thing because of its high temperature.
5. It has the shortest orbit round the sun.

VENUS

1. This is the second closest planet to the sun.
2. It contains no living thing.
3. It is often referred to as THE EARTH TWIN because of their close proximity in size, mass and density.

EARTH

1. This is the only planet where life exists. This is because earth is the only planet that contains oxygen, and force of gravity.
2. It has one natural satellite known as Moon.

MARS

1. This planet is believed to have the possibility of supporting some plant's life.
2. It has two satellites.

JUPITER

1. This is the largest planet in the solar system.
2. Its surface contains gases such as hydrogen and methane with light and dark bands.

SATURN

1. This is the second largest planet after Jupiter.
2. It has three rings around it.

URANUS

1. This is the only planet that revolves round the sun in a clockwise direction.
2. It takes Uranus 84 years to complete its orbit.

NEPTUNE

1. This planet is very cold because of its distance from the Sun.
2. It has two satellites

PLUTO

1. This is the farthest planet from the sun.
2. It is the coldest planet.
3. It has the longest orbit round the sun

EVALUATION QUESTIONS

1. Describe the universe.
2. Give at least one characteristic of each of the planets.

GENERAL EVALUATION QUESTIONS

1. What is a solar system?
2. Name the first four planets and describe their characteristics.
3. State the characteristics of the last planet.

4. What is a satellite?
5. Mention the satellite of the earth.

READING ASSIGNMENT
Essential Geography, O.A. Iwena, Pages 5-7.

WEEKEND ASSIGNMENT

1 Which of the following statement is not true of the solar system? (a) The rays of the sun gives energy of the system (b) All the planets rotate around the sun (c) The planets revolve around the sun.
2 Which two planets lie between the sun and the earth? (a) Venus and Mars (b) Venus and Jupiter (c) Mercury and Venus
3 The planet with the largest orbit around the sun is (a) the Earth (b) Pluto (c) Jupiter
4 Which of the following planet has no satellite? (a) Venus (b) Uranus (c) Neptune
5 The planet often considered as the earth's twin because of their close similarity in size, mass and density is (a) Venus (b) Saturn (c) Mercury

THEORY

1 What is solar system? List the 9 planets in order of their distance from the sun.
2 State three characteristics of the planet Earth.

WEEK THREE

EARTH AS A PLANET

The shape of the earth

The earth has a spherical shape. Its shape can also be described as GEOID.
Though we walk on "flat" surface, it is almost like a sphere and it is slightly flattened at the two poles.
There are many facts to prove that the earth is spherical.

Size of the Earth

The earth is the fifth largest planet in the solar system. The surface area of the earth is approximately 443 million square kilometers (197 million square miles). The earth has a polar diameter of about 12,722km and equatorial diameter of about 12,762km. At the equator, the earth measures about 40,085km in circumference. The polar circumference is 39,955km. Its mean density is estimated to be 5.5 gram per cubic centimeters.

EVALUATION QUESTIONS

1. The shape of the earth is _____?
2. Describe the size of the earth.

PROOFS OF THE EARTH'S SPHERICITY

i. Circumnavigation of the Earth: Ferdinand Magellan and his crew sailed round the world between 1519 and 1522 and came back to their starting point. Since then, several other people have done so thereby confirming the fact that the earth is not flat but spherical. If the Earth was flat, they would have met an abrupt edge thereby falling off.
ii. Sunrise and Sunset: Different parts of the world experience sunrise and sunset at different times. If the earth were flat, the sun would rise and set at the same time for all places. Note that the Earth rotates from west to east, so places in the east see the sun first before places in the west. The sun is said to rise in the east and set at the west.
iii. Aerial Photographs: Photographs of the earth taken from high altitudes by rockets shows that the earth is spherical. This is the most recent proof of the sphericity of the earth.
iv. The Lunar Eclipse: During lunar eclipse, the earth casts a circular shadow on the moon. Only a sphere, like the earth can cast such a circular shadow.
v. Ship's Visibility: When a ship approaching a port is viewed, the top of the mast is seen first before the hull and later the rest of the ship's body. In the same way, if a ship leaves a harbour, it disappears gradually. If the earth is flat, the ship from a distant view would appear and disappear at once.
vi. Shape of other Planets/Planetary Bodies: When the sun, moon, stars and other planetary bodies are viewed from any angle, they are all circular in outline. So the earth cannot be an exception.
vii. Experimental Proof/ Engineer Surveys/Driving Poles of Equal Length: Three poles of equal length driven at the same depth in a level ground were found to have the center pole projected slightly above the poles at either side because of the curvature of the earth. If the earth was flat, all the poles would have been at the same height

EVALUATION QUESTIONS

1. Give four proofs that the earth is spherical in shape.
2. Who was the first man to travel round the world by sea?

MOVEMENT OF THE EARTH

It is the earth on which we stand that is constantly in motion. It revolves round the Sun and turns its different sides to the Sun at different times. When the sun emerges, we say the sun is rising and when the sun recedes, we say the sun is setting. Earth's movement can be grouped into two: The Rotation of the earth and The Revolution of the earth.

THE ROTATION OF THE EARTH

The rotation of the earth is the movement of the earth on its axis. By turning its axis from the west to the east, the earth makes a complete rotation i.e it rotates through 360° in every 24 hours which makes a day. We should note that the earth rotates through 15^{o} in 1 hour or through 1^{o} in 4 minutes.

EFFECTS OF EARTH ROTATION

1. DAY AND NIGTH: As the earth rotates, only one part of the earth surface facing the sun receives the rays of the sun and experiences day, while the other part of the earth backing the sun experiences darkness(night).
2. TIME DIFFERENCES FROM PLACE TO PLACE: it causes difference in local time between places as the earth rotates from west to east, it means that for every 15° we go eastward, the local time is advanced by 1hr and for every 15° westward, the local time is behind by 1hour.
3. APPARENT SUNRISE AND SUNSET: During the rotation of the earth, the part that emerges from darkness into the rays of the sun experiences sunrise, while the part moving away from the sun rays experiences sunset. It thereby causes apparent sunrise and sunset.
4. DEFLECTION OF WIND AND OCEAN CURRENT: The earth rotation causes freely moving object e.g. wind and ocean current to deflect to the right. This deflection is in a clockwise direction when the object lies in the northern hemisphere and it is an anticlockwise direction for an object lying in the southern hemisphere.
5. DAILY RISING AND FALLING OF THE TIDE: This is the rising and falling in the level of water in Seas and Oceans. This takes place twice every day.

EVALUATION QUESTIONS

1. Explain the term earth rotation.
2. Mention three effects of the earth rotation.
3. The earth rotates on its own _____.

B: EARTH REVOLUTION

The word "Revolution" refers to the movement of one body around the sun, the moon revolves around the earth while the earth revolves round the sun.

The moon revolves around the earth once a month. The earth and moon travel together making a complete trip around the sun once a year. Eclipses occur when the three bodies, the sun, the earth and the moon are in straight line.

When the moon comes in-between the earth and the sun, an eclipse of the sun occurs (solar eclipse). When the earth is in-between the sun and the moon, an eclipse of the moon occurs (lunar eclipse).

Revolution is the movement of the earth on its orbit round the sun once in approximately 365 1/4 days i.e one year. Every fourth year has 366days and this is called a leap year. All other years have 365days.

EFFECTS OF EARTH REVOLUTION

1. **It determines a year:** The time it takes a planet to complete one revolution around the sun determines one year in that planet. One year in earth is 365 ¼ days.
2. **Revolution determines the seasons.** There are two main seasons in tropical belt. These seasons are rain and dry season, while in the temperate belt, there are four distinct seasons, summer, autumn, winter and spring.
3. **Changes in the altitude of the mid-day sun:** This refers to Equinox and Solstices.
4. **Varying length of day and night at different times of the year**: The length of day and night varies depending on the position of the earth in relation to the sun.
5. **Changes in seasonal temperature:** It is observed that summers are usually warm and bright while winters are cold and dark in the arctic region.

<u>Dawn and Twilight</u>

Dawn refers to the brief period between sunrise and full daylight while twilight refers to the brief period between sunset and complete darkness.

EVALUATION QUESTIONS

1. Explain earth revolution.
2. State four effects of earth revolution.

GENERAL EVALUATION QUESTIONS

1. Describe the shape of the earth.
2. Explain three proofs to show the shape of the earth.
3. Describe the size of the earth.
4. Give two reasons to show that the shape of the earth is not flat.
5. The sun rises where?

READING ASSIGNMENT

Essential Geography, O.A. Iwena, Pages 7-9.

WEEKEND ASSIGNMENT

1. When a ship appears over the distant horizon, the (a) hull is seen before the cabin (b) hull and the mast are seen together (c) mast is seen before the hull
2. The planet earth lies between (a) mercury and venus (b) mars and Jupiter (c) venus and mars
3. Which of the following is not a proof of the earth's sphericity? (a) circumnavigation of the earth (b) deflection of wind (c) the circular horizon
4. The earth is the ……. largest planet in the solar system (a) third (b) fifth (c) sixth
5. The shape of the earth can also be described as ……. shape (a) egg (b) graph (c) geoid

THEORY

1. List five proofs of the earth sphericity.
2. Give four characteristics of the planet earth.

WEEK FOUR

LATITUDE & LONGITUDE

MEANING OF LATITUDE

Latitude is an angular distance of a point on earth's surface measured in degrees from the centre of the earth. Latitude is parallel to the equator .Equator divides the earth into two equal halves known as Northern & southern hemisphere. Lines of latitude are sometimes called parallel of latitude.

IMPORTANT LINES OF LATITUDE

i. The equator 0° (ii) North pole 90°N (iii) South pole 90°S (iv) The tropic of Cancer 23 $^{1/2}$°N (v) Tropic of Capricorn 23 1/2°S (vi) Arctic circle 66 1/2°N (vii) Antarctic circle 66 1/2°S .

USES OF LINES OF LATITUDES

1. The lines of latitude are used to determine the exact location of a place on the atlas map.
2. They are used to calculate the distance between two places on the earth surface.

LONGITUDE

Longitude is an angular distance measured in degree east and west of the Greenwich Meridian. It is an imaginary line drawn on the globe (earth) running from north to south at right angle to the parallels.

The longitude passing through London and Accra is called the Great, Prime or Greenwich meridian and it is on longitude 0°. All longitudes are called meridian.

IMPORTANT LINES OF LONGITUDE

Long 0° (Prime Meridian) , long 45°E , long 45°W long 90°E long 90°W long180°E etc.

USES OF LINES OF LONGITUDE

1. They are used to calculate local time.
2. They are used to determine the exact location of places on the atlas map.

<u>Similarities between Lines of Latitudes and Meridians</u>

1. Both are used for location of places on the map.
2. Both are numbered in degrees.
3. Both are imaginary lines drawn on the globe.
4. Both contain great circles.

EVALUATION QUESTIONS

1. What is latitude?
2. Mention the important lines of latitude and longitude

Differences between Lines of Longitude and Lines of Latitudes

Lines of latitudes	Lines of longitudes
1. Equator is the only great circle	It has many great circles as opposite parts of lines make a great circle.

2. Lines are shorter towards the pole	Lines are of the same length.
3. They run from West to East	They run from North to South.
4. Lines are parallel to each other	Lines are not parallel to each other but converge at the poles.
5. The lines are called parallels	The lines are called meridians.
6. Lines are used for measuring distance	Lines are used for calculating local time.
7. Has the equator as its reference point	Has Greenwich meridian as its reference point.
8. Latitude measures up to 180° i.e 90°N - 90°S	Longitudes measures up to 360° i.e 180°W - 180°E.

GREAT CIRCLE AND SMALL CIRCLE

A great circle is any line that divides the earth into two equal halves or hemispheres. The centre of the great circle is also the centre of the earth.

Two opposite lines of longitude make a great circle e.g long 0°, 180°W and 180°E, long.30^0W and long15°W, long110°W and 70°E, etc .

On the other hand, a small circle is any line that does not divide the earth into two equal halves or hemisphere. All lines of latitude are small circles except the Equator. Examples are lat.90°N, 90°S, Tropic of cancer, Tropic of Capricorn etc.

EVALUATION QUESTIONS

1. Differentiate between lines of latitude and lines of longitude.
2. Describe a great circle.

GENERAL EVALUATION

1. Mention two uses of lines of latitude and longitude.
2. State two similarities and four differences between longitude and latitude.
3. Describe a small circle.
4. What is a great circle?

READING ASSIGNMENT

Essential Geography, O.A. Iwena, Pages 14-17.

WEEKEND ASSIGNMENT

1. 1. Lines of longitude can best be described as (a) The angular distance of a place north or south of the equator (b) semi circle on the globe (c) imaginary lines on the earth's surface joining the north and south poles
2. The angular distance of a point on the earth's surface measured in degrees from the centre of the earth is known as (a) latitude (b) longitude (c) international date line
3. The shortest flying route between any two points on the earth surface lies along the (a) Tropic of Capricorn (b) Tropic of Cancer (c) Great circle
4. A great circle can be described as (a) a line of longitude (b) the line of latitude (c) a shortest distance between two points on the globe
5. The following are the similarities between lines of longitude and latitude except (a) both are used to calculate local time of a place (b) both are numbered in degree (c) both contain great circles

THEORY

1. State two differences between longitude and latitude.
2. List five important lines of latitude.

WEEK FIVE

CALCULATION OF DISTANCES AND LOCAL TIME

Calculation of distance using lines of latitude

Procedures:

a) locate the two places involved
b) find the latitude difference between the two places
   Note: North-North= subtract

North-South= add
South-North= add
Equator-North= add or subtract
Equator-South= add or subtract

c) multiply the latitude difference by 111km
1°=111km(1° of latitude is approx. 111km on land)

Example 1
Calculate the distance between S.Africa(30oS) and Spain(40oN)
Solution:
i) Lat.diff.=30oS+40N=70o
since 1o=111km
therefore, 111×70=7770km
The distance b/w S.Africa and Spain=7,7770km

EVALUATION QUESTIONS

1. What is the distance between place A (lat.20oS) and place B (lat.51oN)?
2. What is the distance between the Equator and Lagos (14oN)?

Calculation of Local Time using the lines of longitude
Procedures:

1. locate the places involved
2. find longitude difference
3. conversion to time
4. adjust time according to the direction of movement(west or east)

Examples:
1. If the time at town A(long.75°W) is 5.00pm on Friday, what will be the time and day at town B(long.120°E) ?
Solution:
i) Long.diff.=75°+120°=195°
ii) conversion to time=$\frac{195}{15}$ (since 15°=1hr)=13hrs

iii) adjustment of time according to direction of movt.=5pm+13hrs(add,since it is due east)=6.00am on Saturday

EVALUATION QUESTION
Explain how to use longitude to calculate local time

GENERAL EVALUATION
When it is 2.00pm at GMT; what is the time in

a) Ethiopia (45oE)?
b) Los-Angeles (75oW)?
c) Nigeria (15oE)?

READING ASSIGNMENT
Essential Geography, O.A. Iwena, Pages 17-19.

WEEKEND ASSIGNMENT

1. If the time at the Greenwich Meridian is 11.00 am, what would be the local time at a place 75^0 W? (a) 6:00am (b) 6:00pm (c) 7:00am
2. Which of the following is not a characteristic of lines of longitude? They …… (a) converge at the poles (b) run from east to west (c) run from north to south
3. Latitude 66 $1/2^0$S marks the…….. (a) Antarctic circle (b) Arctic circle (c) Tropic of cancer
4. What is the approximate distance of town X from the equator, if it is located on latitude 14^0N? (a) 1232 km (b) 1555km (c) 1675km
5. Which of the following planets has twelve satellites? (a) Jupiter (b) Mercury (c) Saturn

THEORY
Attempt questions 3(a), 3(b), and 4(b) on page 21 of Essential Geography.

WEEK SIX

STRUCTURE OF THE EARTH

The structure of the earth is grouped into two zones: The outer structure and the internal structure.

THE OUTER STRUCTURE OF THE EARTH

The outer structure of the earth is made up of four zones or layers:

(i) Lithosphere
(ii) Hydrosphere
(iii) Atmosphere
(iv) Biosphere

(A) Lithosphere: This is the solid portion of the earth. It is the outermost zone of the earth which is made up of rocks and mineral materials. It represents 30% of the earth surface.

Importance:

(a) It forms the basis for all human settlement.
(b) All mineral resources are derived here.
(c) It aids transportation through construction of roads, railways, airports, etc.
(d) It aids farming activities.
(e) Most human activities like mining, trading, etc are done here.

(B) Hydrosphere: This refers to the liquid portion of the earth. It includes the oceans, sea, rivers, streams and springs, lakes, etc. It covers 70% of the earth's crust.

Importance:

(a) Provides water for domestic uses.
(b) Provides medium for transportation.
(c) Provides water for industrial uses.
(d) Provision of food(fishes, prawns, etc)
(e) Provision of employment.
(f) Serves as tourist centre.
(g) Generation of hydro-electric power(HEP)

EVALUATION QUESTIONS

1. The layer of the earth covered with water is called…….
2. Mention any four importance of hydrosphere to man.

(C) Atmosphere: this is the gaseous portion of the earth. It contains 78% nitrogen, 21% oxygen, 0.03% carbon dioxide and 0.097% rare gases.

Importance:

(a) It is the habitat of some living organisms.
(b) It provides oxygen for respiration.
(c) It provides carbon dioxide for photosynthesis.
(d) It provides oxygen for combustion.
(e) It provides medium of transportation.
(f) It provides nitrogen for protein synthesis in plants.

(D) Biosphere: This is the zone of the earth where living things are found.

Importance:

(a) Plants provide food for man.
(b) Provision of employment.
(c) Provision of raw materials.
(d) Balancing and purification of the atmosphere.

EVALUATION QUESTIONS

1. State the four zones of the outer structure of the earth.
2. State three importance of atmosphere to man.

GENERAL EVALUATION

1. Describe the structure of the earth.
2. Explain the importance of biosphere to man.

3. State four importance of hydrosphere.
4. Mention three importance of atmosphere.
5. List three gases that can be found in the atmosphere.

READING ASSIGNMENT
Essential Geography, O.A. Iwena, Pages 21-24.

WEEKEND ASSIGNMENT
1. The part of the earth where living things are found is known as _____.
   (a) hydrosphere (b) atmosphere (c) biosphere
2. The percentage composition of oxygen in the Atmosphere is _____.
   (a) 78% (b) 21% (c) 23%
3. Which of the following minerals is found in the upper lithosphere?
   (a) Olivine (b) Magnesium (c) Aluminium
4. Human beings live in which area?
   (a) Atmosphere (b) Hydrosphere (c) Lithosphere
5. The part of the earth occupied by water is called _____.
   (a) biosphere (b) atmosphere (c) hydrosphere

THEORY
1. Draw the inner structure of the earth.
2. State two importance of hydrosphere and atmosphere.

WEEK SEVEN
INTERNAL STRUCTURE OF THE EARTH
The internal structure of the earth is made up of three concentric layers which are
(a) The crust (Lithosphere)
(b) The mantle (Mesosphere)
(c) The core (Barysphere)

The Crust: This is subdivided into upper and lower crust. The upper crust consists of granite rocks and forms the continent. The main minerals here are silica and aluminium, collectively referred to as SIAL. It has an average density of 2.7

EVALUATION QUESTIONS
1. Mention the 3 concentric layers of the internal layer of the earth.
2. SIAl is a combination of----- and -----minerals

The lower part of the earth crust consists of basalt rocks and forms the ocean floor. It contains minerals like silica, iron and magnesium, collectively referred to as SIMA. It has an average density of 3.0

The Mantle: This zone is found just beneath the crust. It is about 290km thick with a density of 3.3 Its main mineral is olivine. It is plastic and in semi- liquid form.
The Core : This is the innermost part of the earth. It is about 3500km in radius. It contains two minerals, iron and nickel, collectively referred to as NIFE. The temperature of the core is estimated to be as high as 2000^{o} C. It is in molten state.

EVALUATION QUESTIONS
1. What is the density of sial and sima?
2. A major mineral found in the mantle is called _____.

GENERAL EVALUATION
1. Iron and Nickel is found in _____.
2. State two characteristics of the crust.
3. Describe the core of the earth.
4. Which minerals make up Sial?
5. The core of the earth is made up of _____.

READING ASSIGNMENT

Essential Geography, O.A. Iwena, Pages 23-24.

WEEKEND ASSIGNMENT

1. The barysphere can also be referred to as (a) crust (b) core (c) mantle
2. The percentage composition of Nitrogen in the Atmosphere is ---------- (a)78% (b) 0.03% (c) 21%
3. Which of the following minerals is found in the lower lithosphere? (a) Olivine (b) Magnesium (c) Carbon
4. The temperature of the core is ….. (a) $200^{o}C$ (b) $2500^{0}C$ (c) $2000^{0}C$
5. The density of the mantle is ---------- (a) 3.0 (b) 2.7 (c) 3.3

THEORY

1. Draw the inner structure of the earth.
2. Write short note on the crust of the earth.

WEEK EIGHT

ROCKS OF THE EARTH

The earth crust consists of rocks. A rock is any mineral material of the earth. It may be a combination of different mineral element such as silica which contains silicon and oxygen. All the rocks differ from one another in texture, structure, colour, permeability, mode of occurrence and degree of resistance to denudation.

Types of rocks: Rocks are classified into the following; Igneous rocks, Sedimentary rocks and Metamorphic rocks.

Characteristics of Igneous rocks

1. They are crystalline in structure ie they contain crystals.
2. They do not occur in layers.
3. They do not contain fossils.
4. They are usually hard and impervious.
5. They are resistant to erosion and element of weather.

Mode of Formation

They are formed by the cooling and solidification of molten magma, ejected from beneath the earth crust.

As the magma moves towards the surface, it comes in contact with lower temperature, hence cooling and solidifying to form igneous rock.

There are two major types of Igneous rock. These are:

(A) **Plutonic (Intrusive) Igneous rocks:** These are Igneous rocks formed inside the earth crust as a result of the cooling and solidification of the molten magma inside the crust i.e before it gets to the surface. This results to rocks with large crystals. Examples include granite, gabbro and diorite.

(B) **Volcanic (Extrusive) Igneous rocks**: These rocks form outside the earth crust due to the cooling and solidification of molten magma on the surface of the earth. This results to rocks with small crystals. Examples include basalt.

EVALUATION QUESTIONS

1. Give two examples of plutonic igneous rocks.
2. Mention three characteristics of igneous rocks.

Characteristics of Sedimentary Rocks

1. They occur in layers or strata.
2. The rocks may be coarse, fine soft or hard.
3. They do not exist in crystals i.e they are not crystalline.
4. They do not contain fossils
5. They are not resistant to erosion

Mode of Formation

Sedimentary rocks are formed from sediments deposited by water, wind, or ice. These sediments are deposited in layers or strata one on top of another, and after a long period of time, they become hardened by compression to form Sedimentary rocks. Sedimentary rocks are therefore said to be stratified or layered.

There are three main types of Sedimentary rocks. This classification is based on their mode of formation.

(A) **Mechanically formed Sedimentary rocks:** These are formed from sediments of other rocks that have accumulated over a period of time. Examples include sandstone, breccia, shale, clay and conglomerates.
(B) **Organically formed Sedimentary rocks:** These are rocks formed from the remains of living organisms eg plants and animals. Those formed from plant remains are known as CARBONACEOUS Rocks e.g Coal, Peat, Lignite, Petroleum, etc while those formed from animal remains are known as CALCAREOUS Rocks eg Limestone and Chalk.
(C) **Chemically formed Sedimentary rocks:** These are rocks precipitated chemically from solutions. Examples include Potash, Sodium Chloride(Common Salt), Nitrate, Gypsum and Dolomite.

EVALUATION QUESTIONS

1. State two characteristics of sedimentary rocks.
2. Explain the mode of formation of sedimentary rocks.

GENERAL EVALUATION

1. State five importance of rocks to man.
2. Explain the mode of formation of igneous rock.
3. Describe organically formed sedimentary rock.
4. State the characteristics of igneous rock.
5. Give examples of chemically formed sedimentary rock.

READING ASSIGNMENT

Essential Geography, O.A. Iwena, Pages 24-25.

WEEKEND ASSIGNMENT

1. They are formed in layers and derived from old rocks and the remains of dead organic materials. This description refers to (a) metamorphic rocks (b) sedimentary rocks (c) igneous rocks
2. Granite and diorite are examples of (a) igneous rock (b) sedimentary rock (c) metamorphic rock
3. All the following rocks are sedimentary except (a) gneiss (b) limestone (c) chalk
4. Chalk is a good example of (a) plutonic igneous rock (b) organically formed sedimentary rock (c) mechanically formed sedimentary rock
5. Which of the following is not a rock? (a) Grit (b) Petrol (c) Micro-organisms

THEORY

1. State two characteristics of sedimentary rock.
2. Mention three importance of rock to man.

WEEK NINE

GEOGRAPHIC INFORMATION SYSTEM (GIS)

A **geographic information system** (**GIS**) is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

The acronym GIS is sometimes used for **Geographical Information Science** or **Geospatial Information Studies** to refer to the academic discipline or career of working with geographic information systems and is a large domain within the broader academic discipline of Geoinformatics.

In general, GIS describes any information system that integrates, stores, edits, analyzes, shares, and displays geographic information. GIS applications are tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data in maps, and

present the results of all these operations. Geographic information science is the science underlying geographic concepts, applications, and systems.

Data representation

GIS data represents real objects (such as roads, land use, elevation, trees, waterways, etc.). Real objects can be divided into two abstractions: discrete objects (e.g., a house) and continuous fields (such as rainfall amount, or elevations).

Traditionally, there are two broad methods used to store data in a GIS for both kinds of abstractions mapping references: raster images and vector.

GENERAL EVALUATION QUESTIONS

1. What is GIS?
2. Mention two features that can be represented with GIS.
3. State three cultural features.
4. Mention five physical features in your environment
5. Define geography.

WEEKEND ASSIGNMENT

1. Real objects can be divided into (a) continuous and circulatory (b) discrete and continuous (c) circulatory and discrete
2. Raster images are used to (a) analyse data (b) interpret data (c) store data
3. All are physical objects except (a) road (b) mountain (c) river
4. Which of these is a socio-cultural feature? (a) airport (b) trees (c) lake
5. 'Geo' refers to (a) description (b) space (c) earth

THEORY

1. State two uses of GIS.
2. Write three features within the school that can be represented with GIS.

WEEK TEN
MAJOR LANDFORMS OF THE WORLD
MOUNTAINS

Mountains are great elevated land surfaces resulting from intense action of internal forces. They have steep slopes and show distinct peaks. Mountains are classified according to **their mode of formation**, resulting in four major types of mountains. These are (i) Fold mountains (ii) Block Mountains (iii) Volcanic Mountains and
(iv) Residual mountain

(a) Fold Mountains

Characteristics: They contain old hard rocks with steep sides. They have wrinkling or folding appearance and show distinct peaks of great heights. Fold Mountains exist in layered form. They are soft, and have anticlines and synclines.
Folding shortens the earth's crust. They form most wide spread type of Mountains and are noted for active volcanoes. They form the highest Mountain ranges. Examples of Fold Mountains include **Himalayas, Rockies, Andes Alps and Atlas Mountains**

Mode of formation: They are formed by large- scale horizontal earth movement as a result of stress and compressional forces which cause expansion or contraction of some parts of the earth. Such stresses therefore subject the rocks to compressional forces.
The compressional forces produce wrinkling or folding of the crust of the earth. The up folds of the wrinkles are **anticlines** while the down folds are called **syncline.**
A fold may be **simple**, but where the compressional forces are complex, it results in **asymmetrical folding.** When pushed further, it forms an **overfold,** an overfold later forms a **recumbent fold.** In some cause, faults or cracks result in extreme folding to form **over thrust fold.**

(b) Block Mountains

Characteristics: Block Mountains are made up of old hard rocks with flat or slightly sloping surfaces. They have steep sides. They are associated with rift valleys. Examples pf Block Mountains include **Hunsruck Mountain, Voges Mountain and the Black Forest of the Rhine land**. Example of rift valley is the East African rift valley system which is about 4.800km

Mode of Formation: Block Mountains are formed when the earth cracks due to **faulting**. Faulting may result from tensional forces or compressional forces. Tensional forces are those that tend to pull the earth's crust apart and they result in a **normal fault** while the Compressional forces are those that shorten the crust to produce a **reverse or thrust fault.** Therefore, if a block of rock between two normal faults rises or the land on either sides of the block subsides, a **block mountain or Horst** is formed. At times, a block in between two faults may subside so that **rift valley or graben** is formed. The slopes and height of Block Mountains are modified by agents of denudation.

EVALUATION QUESTIONS:

1. Mention any three types of mountain
2. Block mountain is also called?.....
3. Rift valley is associated with ……. Mountain?

(c) Volcanic Mountain

Characteristics: Volcanic Mountains are made up of lava. They have irregular sides with conical shape. Materials that make up volcanic mountains include ash, volcanic bombs, and cinders etc which are arranged in layers. Examples include **Mt. Fuji (Japan), Mt. Mayon (Philippines), Mts Kilimanjaro, Kenya, Elgon, Ruwenzori and Cameroon** (all in Africa)

Mode of formation: Volcanic Mountains are formed from volcanoes which are built from materials (molten magma) ejected through fissures or vents in the earth's crust. The material also includes molten lava, volcanic bombs, cinders, ash, dust and liquid mud. They fall around the vent in successive layers, building up an extensive volcanic cone. Volcanic Mountain are also called **Mountain of accumulation**

(d) Residual Mountain

Characteristic: Residual Mountains are formed from the remains of already existing mountains. They have irregular surfaces with steep sides. They occur in varying heights and sizes and are caused by agents of denudation. Examples include **Mt Manodnock (U.S.A), Highlands of Scotland, Highlands of Scandinavia and Decon Plateau**.

Mode of formation: Residual Mountains are formed from already existing mountains which are lowered or reduces by agents of denudation such as running water, ice and wind. Residual mountains are therefore, the remains of the existing mountains. Some hard and the very resistant parts of the existing mountains remain after the lowering of the upper part. This remaining parts is called **residual mountains** which are also called **mountains of denudation**

Importance or uses of mountains

1. Sources of Minerals
2. Formation of Rainfall
3. For Transhumance
4. Climatic Barriers
5. For Defence
6. As Tourist Centers
7. Construction of Hydro-electric Power
8. As Wind-breaks

Disadvantages of Mountains

1. It causes barrier to communication
2. It prevents human habitation
3. Mountains promote soil erosion
4. Mountains occupy good land that could have been used for other useful things
5. Mountain soil is poor in nutrients.

GENERAL EVALUATION QUESTIONS:

1. Volcanic and residual mountains are also called…… and…….
2. Mention two examples of a volcanic mountain.
3. Give four importance of mountains to man.
4. What is a highland?
5. Give an example of a highland.

READING ASSIGNMENT

Essential Geography pages 31-33.

WEEKEND ASSIGNMENT

1. The unfolds of the wrinkles produced in Fold Mountain is known as
   (a) synclines (b) anticlines (c) push ups (d) push downs
2. Which of these is not a fold mountain (a) atlas mountain (b) Himalayas
   (c) mountain Kenya (d) alps
3. Which of these mountains is produced by faulting (a) fold mountain (b) residual mountain (c) block mountain (d) volcanic mountain
4. Another name for "mountain of accumulation" is (a) residual mountain (b) fold mountain (c) volcanic mountain (d) block mountain
5. Mountain Manodnock in USA is an example of (a) fold mountain (b) block mountain (c) volcanic mountain (d) residual mountain

THEORY

1. With diagram, explain the formation of any one type of mountain.
2. List three advantages and two disadvantages of mountains.