**GEOGRAPHY SS 1**

**FIRST TERM**

**SCHEME OF WORK**

WEEK ONE

**Introduction to Geography: Meaning, Nature, Scope and Value of Geography**

**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 to the different peoples of the world, their occupations, cultures, ways of dressing, religion, etc.

Besides, Geography involves the study of physical things within the earth such as rocks, mountains, plains, valleys, rivers, oceans, weather, rainfall, soils, vegetation, etc.n

**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.

**Self-evaluation:**

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 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 etc.
6. It enables us to have a better understanding of physical things around us such as vegetation, climate, rivers, soil, oceans, mountains etc.
7. It enables us to choose a career from which we can earn a living.

**Self-evaluation:**

What are the values of Geography?

**General self-evaluation**

1. What is Geography?
2. Explain the scope of Geography.
3. What is the importance of Geography in our society?
4. ‘Geo’ in the word geography means what?
5. The capital of Lagos state is \_\_\_\_\_\_.

**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

The 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

It 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 the 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**

1. What is a solar system?
2. Define

* Galaxy
* Satellite
* 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**

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

###### General evaluation

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.

**Theory**

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

WEEK THREE

# The 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 kilometres (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 centimetres.

**Evaluation**

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

##### Proofs of the earth’s sphericity

1. **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 were flat, they would have met an abrupt edge, thereby falling off.
2. **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.
3. **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.
4. **The lunar eclipse:** During a lunar eclipse, the earth casts a circular shadow on the moon. Only a sphere, like the earth, can cast such a circular shadow.
5. **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.
6. **The 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.
7. **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 centre 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**

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 15o in 1 hour or through 1o in 4 minutes.

##### Effects of earth rotation

1. **Day and night:** 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 a 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 rising and falling in the level of water in Seas and Oceans. This takes place twice every day.

**Evaluation**

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

##### 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 a 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 on that planet. One year on earth is 365 ¼ days.
2. **Revolution determines the seasons:** There are two main seasons in the 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. **The 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.

##### Dawn and twilight

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

**Evaluation**

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

###### General evaluation

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?

**Theory**

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

WEEK FOUR

# Latitude and Longitude

#### 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. The Equator divides the earth into two halves known as Northern & southern hemisphere. Lines of latitude are sometimes called parallel of latitude.

##### Important lines of latitude

1. The equator 0°
2. North pole 90°N
3. South pole 90°S
4. The tropic of Cancer  23 1/2°N
5. Tropic of Capricorn  23 1/2°S
6. Arctic circle  66 1/2°N
7. 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 a 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 the meridian.

##### Important lines of longitude

1. Long  0° (Prime Meridian)
2. Long  45°E
3. Long 45°W
4. Long 90°E
5. Long 90°W
6. 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.

###### Similarities between lines of latitudes and meridians

1. Both are used for the 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**

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** |
| * The Equator is the only great circle | It has many great circles as opposite parts of lines make a great circle. |
| * Lines are shorter towards the pole | Lines are of the same length |
| * They run from West to East | They run from North to South |
| * Lines are parallel to each other | Lines are not parallel to each other but converge at the poles. |
| * The lines are called parallels | The lines are called meridians |
| * Lines are used for measuring distance | Lines are used for calculating local time |
| * Has the equator as its reference point | Has Greenwich meridian as its reference point. |
| * Latitude measures up to 180° i.e. 90°N – 90°S | Longitudes measure up to 360° i.e. 180°W – 180°E |

#### Great circle and the small circle

A great circle is any line that divides the earth into two 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 300W and long 15°W, long 110°W and 70°E, etc.

On the other hand, a small circle is any line that does not divide the earth into two 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**

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?

**Theory**

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

WEEK FIVE

# Latitude and Longitude II

#### Calculation of distances and local time

The distance between one line of the latitude and another is 111km. Two points lying North or South of the equator are subtracted to get the latitude difference.

**Example:**

Calculate the appropriate distance in a straight line between Tama (lat 60N) and London (lat 520 N).

**Solution**

Latitude difference = 520 – 60 = 460  
Average distance = 111km  
460 = 46 x 111km = 5, 106km

#### Calculation of local time and longitude

The earth rotates at an angle of 10 in 4minutes; 150 in 1 hour and 3600 in 24 hours.

**Example:**

If the time in Cameroon 300E is 3:00 pm. What time will it be in London?

**Solution**

300 = 30 x 1 x 4minutes = 120 minutes = 2 hours

Time in London = 3:00pm – 2 hours

15 hours – 2 hours

Time in London = 13hours

Time in London = 1:00 pm

#### International dateline

##### Time and time zones:

Time zones are based on the fact that Earth moves through 15 degrees of longitude (imaginary vertical lines drawn on the globe) each hour. Therefore, there are 24 standard time zones (24 hours x 15º=360º), which is the sum of angles in a circle.

Time zones are counted from the **Prime Meridian** (0º longitude), which runs through Greenwich, England. Each time zone is based on a central meridian, counted at 15º intervals from the Prime Meridian, and extends 7½º to either side of the central meridian.

For example, Nigeria lies between the longitudes 3° and 14° E of the Greenwich Meridian, much of which is in the zone of the 15ºE central meridian (GMT+1), and the time zone for this meridian includes all locations between 7½ºE and 22½ºE.

Lagos though lies at longitude 3° 27′ E and falls under the time zone for the Greenwich Meridian ( 7½°W – 7½°E), but for the sake of simplicity, and so that all parts of the country will operate at one time, it has been grafted into the GMT+1 time zone.

The need for standard time zones emerged with the spread of high-speed transportation systems – first, trains and later, aeroplanes. The system of time zones that is in use till date was agreed upon by delegates from 27 countries who met in Washington DC in 1884.

Countries like the United States operate at 4 time zones – while it is 9 am (GMT -5), Wednesday in New York; it is 6 am (GMT -8), Wednesday in Los Angeles – because the country spans about 3,000 miles (over 4,800 km) from East to West. But China, though spanning over 3,000 miles (over 5,000 km) from East to West operates at just one-time zone (GMT+8).

Countries like New Zealand start the day first, followed by Japan, Australia, Russia, China and India, followed by countries in Europe and Africa, followed by countries in North and South America, and ending on islands out in the Pacific Ocean, like Hawaii and finally Samoa.

##### Calculation of distance using lines of latitude

**Procedures:**

1. locate the two places involved
2. 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
* Multiply the latitude difference by 111km

1°=111km (1° of latitude is approx. 111km on land)

**Example 1:**

Calculate the distance between S. Africa (30°S) and Spain (40°N)

**Solution**

Lat. diff. =30°S+40°N=70°

since 1°=111km

therefore,     111×70=7770km

The distance b/w S. Africa and Spain=7,7770km

**Evaluation**

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

##### 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 5.00 pm on Friday, what will be the time and day at town B(long.120°E)?

**Solution**

i) Longitude difference = 75°+120°=195°

ii) conversion to time = 195 (since 15°=1hr)=13hrs \* 15

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

**Evaluation**

Explain how to use longitude to calculate local time

###### General evaluation

When it is 2.00 pm in GMT; what is the time in

1. Ethiopia (45oE)?
2. Los-Angeles (75oW)?
3. Nigeria (15oE)?

**Theory**

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

WEEK SIX

# The Structure of the Earth- the Outer Zone

#### The outer zone

The structure of the earth is grouped into two zones:

1. The outer structure and
2. The internal structure.

Earth is unique among the known planets: it has an abundance of water. Other worlds — including a few moons — have atmospheres, ice, and even oceans, but only Earth has the right combination to sustain life.

Earth’s oceans cover about 70 percent of the planet’s surface with an average depth of 2.5 miles (4 kilometres). Freshwater exists in liquid form in lakes and rivers and as water vapour in the atmosphere, which causes much of Earth’s weather.

The interior structure of the Earth is layered in spherical shells, like an onion. These layers can be defined by their chemical and their rheological properties. Earth has an outer silicate solid crust, a highly viscous **mantle**, a liquid outer core that is much less viscous than the **mantle**, and a solid inner core. The earth’s structure is divided into two groups, namely Outer structure and Inner structure.

#### The outer structure of the earth

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

1. Lithosphere
2. Hydrosphere
3. Atmosphere
4. Biosphere

##### 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

1. It forms the basis for all human settlement.
2. All mineral resources are derived here.
3. It aids transportation through the construction of roads, railways, airports, etc.
4. It aids farming activities.
5. Most human activities like mining, trading, etc are done here.

##### 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

1. Provides water for domestic uses.
2. Provides medium for transportation.
3. Provides water for industrial uses.
4. Provision of food(fishes, prawns, etc)
5. Provision of employment.
6. Serves as a tourist centre.
7. Generation of hydro-electric power(HEP)

**Evaluation**

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

##### 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

1. It is the habitat of some living organisms.
2. It provides oxygen for respiration.
3. It provides carbon dioxide for photosynthesis.
4. It provides oxygen for combustion.
5. It provides a medium of transportation.
6. It provides nitrogen for protein synthesis in plants.

##### Biosphere:

This is the zone of the earth where living things are found.

###### Importance

1. Plants provide food for man.
2. Provision of employment.
3. Provision of raw materials.
4. Balancing and purification of the atmosphere.

**Evaluation**

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.

**Theory**

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

WEEK SEVEN

# The Structure of the Earth- the Interior Zone

**INTERNAL**

#### Structure of the earth

The Earth is made up of four distinct layers:

The inner core is in the centre and is the hottest part of the Earth. It is solid and made up of iron and nickel with temperatures of up to 5,500°C. With its immense heat energy, the inner core is like the engine room of the Earth.

The outer core is the layer surrounding the inner core. It is a liquid layer, also made up of iron and nickel. It is still extremely hot, with temperatures similar to the inner core.

The mantle is the widest section of the Earth. It has a thickness of approximately 2,900 km. The mantle is made up of semi-molten rock called magma. In the upper parts of the mantle, the rock is hard, but lower down the rock is soft and beginning to melt.

The crust is the outer layer of the earth. It is a thin layer between 0-60 km thick. The crust is the solid rock layer upon which we live.

There are two different types of crust: continental crust, which carries land, and oceanic crust, which carries water.

##### Mantle:

Earth’s mantle extends to a depth of 2,890 km, making it the thickest layer of Earth. The mantle is divided into the upper and lower mantle. The upper and lower mantle are separated by the transition zone

##### Earth crust:

Earth’s crust is made up of several elements: oxygen, 47 percent; silicon, 27 percent; aluminium, 8 percent; iron, 5 percent; calcium, 4 percent; magnesium, potassium and sodium, 2 percent. The crust ranges from 5–70 km (~3–44 miles) in depth and is the outermost layer. The thin parts are the oceanic crust, which underlies the ocean basins (5–10 km) and is composed of dense (mafic) iron magnesium silicate igneous rocks, like basalt.

The thicker crust is the continental crust, which is less dense and composed of (felsic) sodium potassium aluminium silicate rocks, like granite. The rocks of the crust fall into two major categories – sial and sima.

##### Earth core:

At the centre of the Earth is the core, which has two parts. The solid, inner core of iron has a radius of about 760 miles (about 1,220 km). It is surrounded by a liquid, outer core composed of a nickel-iron alloy. It is about 1,355 miles (2,180 km) thick.

The inner core spins at a different speed than the rest of the planet. This is thought to cause Earth’s magnetic field. When charged particles from the solar wind collide with air molecules above Earth’s magnetic poles, it causes the air molecules to glow, causing the auroras — the northern and southern lights.

**Evaluation**

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 \_\_\_\_\_\_.

**Theory**

1. Draw the inner structure of the earth.
2. Write a 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 elements 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;

1. Igneous rocks
2. Sedimentary rocks and
3. Metamorphic rocks.

##### Igneous 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:

1. **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 in rocks with large crystals. Examples include granite, gabbro and diorite.
2. **Volcanic (Extrusive) Igneous rocks**: These rocks from outside the earth crust due to the cooling and solidification of molten magma on the surface of the earth. This results in rocks with small crystals. Examples include basalt.

**Evaluation**

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

##### Sedimentary 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, 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.

1. **Mechanically formed sedimentary rocks:** These are formed from sediments of other rocks that have accumulated over some time. Examples include sandstone, breccia, shale, clay and conglomerates.
2. **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.
3. **Chemically formed sedimentary rocks:** These are rocks precipitated chemically from solutions. Examples include Potash, Sodium Chloride(Common Salt), Nitrate, Gypsum and Dolomite.

**Evaluation**

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.

**Theory**

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

WEEK NINE

# Basic Concept of 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](http://en.wikipedia.org/wiki/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](http://en.wikipedia.org/wiki/Information_system) and is a large domain within the broader academic discipline of [Geoinformatics](http://en.wikipedia.org/wiki/Geoinformatics).

In general, GIS describes any [information system](http://en.wikipedia.org/wiki/Information_systems) that integrates, stores, edits, analyzes, shares, and displays [geographic](http://en.wikipedia.org/wiki/Georeference) information. [GIS applications](http://en.wikipedia.org/wiki/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](http://en.wikipedia.org/wiki/Raster_images) and [vector](http://en.wikipedia.org/wiki/Vector_graphics).

##### General evaluation

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.

**Theory**

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

WEEK TEN

# Major Landform Features

#### Mountains

Mountains are greatly elevated land surfaces resulting from the 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

1. Fold mountains
2. Block Mountains
3. Volcanic Mountains and
4. Residual mountain

###### 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 the most widespread type of  Mountains and are noted for active volcanoes. They form the highest Mountain ranges. Examples of Fold Mountains include the **Himalayas, Rockies, Andes Alps and the 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 a **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.**

###### 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 the 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 side 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**

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

###### Characteristics

Volcanic Mountains are made up of lava. They have irregular sides with a 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 is also called **Mountain of accumulation**

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

###### General evaluation

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.

**Theory**

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