



SECOND TERM E-LEARNING NOTE

SUBJECT: GEOGRAPHY

CLASS: SS 1

SCHEME OF WORK

WEEK	TOPIC
1	REVISION / MOUNTAINS
2	PLATEAUX
3 - 4	LOWLAND (PLAINS)
5	THE ENVIRONMENT
6 - 7	WEATHER AND CLIMATE
8	COMPONENTS OF GEOGRAPHIC INFORMATION SYSTEM (GIS)
9	INTRODUCTION TO MAP READING: DEFINITION, TYPES OF MAP, AND SCALE
10	MAP DISTANCES (CONVERSION, DIRECTION AND BEARING)
11	REVISION

REFERENCE MATERIAL

Essential Geography for Senior Secondary Schools, O.A. Iwena.

WEEK ONE

TOPIC: 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 mountain (ii) Block Mountain (iii) Volcanic Mountain (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 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 **over-fold**. An over-fold later forms a **recumbent fold**. In some cases, faults or cracks result in extreme folding to form **over thrust fold**.

Evaluation Questions

1. What is a mountain?
2. State the types of mountains.



(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 of 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 withMountain?

(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 which are arranged in layers. Examples include **Mt. Fuji (Japan), Mt. Mayon (Philippines), Mt 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 materials also include 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 mountains 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 reduced by agents of denudation such as running water, ice and wind. Residual mountains are therefore, the remains of the existing mountains. Some hard and very resistant parts of the existing mountains remain after the lowering of the upper part. This remaining part is called **residual mountain** which is also called **mountain 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. Barriers to Communication.
2. Prevent Human Habitation.
3. Mountains Promote Soil Erosion.
4. Mountains Occupy good land that could have been used for other useful things.
5. Mountains soil is poor in nutrients.

Evaluation Questions:

1. Volcanic and residual mountains are also called..... and.....
2. Mention two examples of a volcanic mountain.

General Evaluation Questions

1. Mention the types of mountains.
2. Explain the mode of formation of residual mountain.
3. What is mountain of accumulation?
4. Give four importance of mountains to man.
5. State the disadvantages of mountains.

Reading Assignment

Read on mountains in Essential Geography, Pgs. 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) Mt. 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 diagrams, explain the formation of any two types of mountain.
2. List two disadvantages of mountains.

WEEK TWO

TOPIC: PLATEAUX

Plateaux are elevated uplands. They have extensive flat or level surfaces which usually descend sharply to the surrounding lowland. It has gentle slope. They are often referred to as **table lands** because of their flat or level surfaces. Plateaus are tabular in shape, steep-sided with rough and irregular surface. They have narrow valleys and sometimes used for hydrological centers. Mesas and buttes may be present.

Most Plateaux are relics of ancient mountain ranges.

Types of Plateau

(i) Tectonic Plateau (ii) Volcanic Plateau (iii) Dissected Plateau

(a) **Tectonic Plateaux**



Mode of Formation: These plateaux are formed as a result of earth movement which causes the uplift of some areas and the depression of others. Uplifted areas of level or undulating land form **tectonic plateau** and the depressed area form **basins**.

Tectonic plateau are two types (i) Table Land and Intermont. Examples of Tectonic Plateau include **Decan plateau (India)**, **Harz (Germany)**, and **Mesetal (Liberia)**. **Intermont** is formed when the uplifted areas are enclosed by fold mountains e.g. Tibetan plateau between Himalayas and Kunlun, and Bolivia plateau.

(b) Volcanic or Lava Plateau

Mode of Formation: These plateaux are formed when molten lava comes out of the earth's crust through a vent and spreads out in successive layers. The lava cools solidifies to form volcanic or lava plateau. Examples include **Antrim plateau of Northern Ireland** and **Columbia Snake Plateau**.

Evaluation Questions:

1. What is a plateau?
2. How is tectonic plateau formed?
3. Mention the two types of tectonic plateau.

(c) Dissected Plateau

Mode of Formation: These plateaux are formed due to weathering and agents of denudation such as running water, wind, ice etc which wear down large and extensive plateau into remnant structures of irregular surface called dissected plateau. They may also be formed as a result of uplift. Examples include **Jos Plateau (Nigeria)**, edges of **Fouta Djallon Plateau (Guinea)** and **Kumasi Plateau (Ghana)**.

Importance or Uses of Plateau

- (1) Some plateaux are sources of valuable mineral like tin, gold, diamond, etc. which are useful to man.
- (2) Some plateaux are centers of tourist attraction.
- (3) Some plateaux are sources of rivers.
- (4) Some plateaux like Jos plateau, have cold climate which encourages settlement of people.
- (5) Most plateaux, due to their cold climate and fertility, promote some specialization farming which gives rise to the cultivation of specific crops.
- (6) Plateaux also support the growth of pasture grasses and legumes which support the rearing of animals e.g. cattle, sheep and goat.

Disadvantages of Plateaux

- (1) Some plateaux are barriers to communication as they prevent road, railway and airport construction.
- (2) Some plateaux are associated with erosion which tends to reduce or prevent serious farming activities.

Evaluation Questions:

1. When will a plateau be regarded as dissected?
2. Give two examples of a dissected plateau.

General Evaluation

1. Mention two advantages and two disadvantages of a plateau.



2. Explain the mode of formation of a dissected plateau.
3. Explain tectonic plateau.
4. What is solar system?
5. List the nine planets.

READING ASSIGNMENT

Read on plateau in Essential Geography. Pgs 34-35.

Weekend Assignment

1. The uplifted area of the level land which is enclosed by fold mountain is known as (a) table land (b) plateau (c) intermont (d) horst
2. The type of plateau which is formed by agents of denudation is (a) volcanic plateau (b) tectonic plateau (c) residual plateau (d) dissected plateau
3. Jos Plateau in Nigeria is a good example of (a) Volcanic plateau (b) tectonic plateau (c) Dissected plateau (d) Residual plateau
4. Which of these plateaux is known as Lava plateau? (a) Volcanic plateau (b) Tectonic plateau (c) Dissected plateau (d) Residual Plateau
5. Columbia snake plateau is an example of (a) Dissected plateau (b) Volcanic plateau (c) Tectonic plateau (d) Block plateau

THEORY

1. What is intermont?
2. State four uses of plateau.

WEEK THREE AND FOUR

TOPIC: LOWLAND (PLAINS)

A plain is an extensive area of level or gentle undulating land, usually a few meters above the sea-level.

Types of Plains

(i) Structural Plain (ii) Erosional Plain (iii) Depositional Plain

(1) Structural Plains

Mode of Formation: These are relatively undisturbed horizontal surface of the earth, formed by bedded sedimentary rocks. Examples include **the Russian Platform** and **the Great Plains of the U.S.A.**

(2) Erosional Plains

Mode of Formation: These plains are formed by the agents of denudation such as river, wind, rain, glacier and ocean waves which wear out irregular rock surface and smoothen them into plain known as erosional plains. Plain, resulting from the action of these agents of denudation are called **peneplains** while those formed when wind blows and reduces a highland to a flat or level but a gentle land is called **pediplain**. Examples of erosional plains include **Canadian Shield, Reg** and **Hamada of Sahara desert**.

Evaluation Questions:

1. What is a plain?
2. State the types of plain.

(3) Depositional Plain



Mode of formation: These are plains formed by the deposition of materials or sediments transported by the various agents of transportation such as river, wind, wave and glacier.

Depositional plains are grouped into the following categories:

- | | |
|---------------------|-----------------------|
| (a) Alluvial Plains | (b) Flood Plains |
| (c) Deltaic Plains | (d) Outwash Plain |
| (e) Aeolian Plains | (f) Lacustrine Plains |
| (g) Coastal Plains | |

Importance or Uses of Plains

- (1) Plains, especially level ones are good for human habitation. Population and settlements are usually concentrated on plains.
- (2) Some plains are rich sources of minerals like petroleum and coal.
- (3) Plains, especially depositional plains are rich fertile soils which favour intensive agriculture.
- (4) Plains generally favour construction of roads, railway and airport.
- (5) In areas of low rainfall, rearing of animals are carried out in plains as they favour the growth of pasture.
- (6) Rivers in plains provide water for drinking and transportation.
- (7) Rivers in plains provide jobs e.g. fishing.

Disadvantages of Plain

- (1) Some plains, especially in delta areas may be flooded with water and this reduces human activities.
- (2) Some may pose serious barrier to communication, especially water either from river or after rain. It therefore increases the cost of developing such areas e.g. construction of flyovers.

Evaluation Questions:

1. Explain depositional plain.
2. State the uses of plain.

General Evaluation Questions:

1. What is a plain?
2. Mention the major types of plains.
3. Mention any five types of depositional plains.
4. Differentiate between structural plain and erosional plain.
5. Explain effects of earth rotation.

Reading Assignment

Read on plains in Essential Geography, Pgs. 35-36.

Weekend Assignment

1. An extensive area of level or gentle undulating land which is usually a few meters above the sea level is known as (a) Plain (b) Mountain (c) Valley (d) Plateau
2. Which of these plain is associated with glacier (a) Deltaic Plain (b) Flood Plain (c) Outwash Plains (d) Lacustrine Plains
3. Plains formed by agents of denudation are known as (a) Dissected Plain (b) Residual Plain (c) Erosional Plains (d) Structural Plain
4. Which of the following is not a depositional plain (a) Outwash Plains (b) Piedmont Plain (c) Deltaic Plain (d) Flood Plain



5. Great plains of USA is a good example of (a) Volcanic Plains (b) Structural Plains (c) Erosional Plains (d) Depositional Plains

THEORY

1. Explain briefly the difference between Pene Plain and Pedi Plain.
2. State four disadvantages of plains.

WEEK FIVE

TOPIC: THE ENVIRONMENT

Environment is defined as the total surrounding or medium of any organism in a given area. This include the physical surroundings, climatic factors and other living organisms in that surrounding.

SPHERES OF THE ENVIRONMENT

The earth as an environment is grouped into four spheres:

- i. Lithosphere: The solid portion of the environment which contains rocks, sand, soil, minerals etc.
 - ii. Hydrosphere: This is the liquid portion of the environment like rivers, lakes and oceans.
 - iii. Atmosphere: This is the gaseous portion of the environment where gases like oxygen, nitrogen, carbon-dioxide, ozone are found.
 - iv. Biosphere: This is the portion of the environment where plants and animals are found.
- These four spheres of the environment are interrelated and interdependent on each other.

EVALUATION:

1. What is an environment?
2. State the components of the environment.

ECOSYSTEM

Ecosystem: An ecosystem is defined as the community of plants and animals living together in harmony and interacting with their physical environment.

In other word, an ecosystem can be defined as the relationship that exists between living things and their non-living environment.

Components of Ecosystem

The ecosystem is made up of two main components. These are:

- (a) Abiotic (non-living) component: These are the components like soil, water, gases, sunlight etc in the environment.
- (b) Biotic component: This is the living component of the ecosystem. It includes plants and animals.

Biotic components can be grouped into three:

- (1) Autotrophs: These are also called the producers. They include the green plants which manufacture their own food through a process known as photosynthesis.
- (2) Heterotrophs: These are called primary and secondary consumers. These organisms cannot manufacture their own food but depend directly or indirectly on plants for their food e.g. man, parasites, saprophytes.
- (3) Decomposers: These are micro – organisms that decompose dead organic matter in order to release nutrients required by producers to prepare their food e.g. Fungi and bacteria.



INTERDEPENDENCE WITHIN THE ECOSYSTEM

Interdependence is used to describe the relationship between the components of the ecosystem. This is because components in an ecosystem depend on one another and they cannot exist in isolation. A state of inter-dependence within the ecosystem is best achieved where the components are undisturbed.

Inter-dependence in an ecosystem exist in three ways:

- (1) Interdependence within Abiotic components e.g. The weathering of rock to form soil or the evaporation of water to form cloud etc.
- (2) Interdependence within Biotic components e.g. Animals depend on plants for food or the exchange of oxygen and carbondioxide by plants and animals.
- (3) Interdependence between the biotic and abiotic components e.g. plants depend on soil for support and nutrients, Autotrophs convert sunlight to energy, water and carbon dioxide during photosynthesis to produce food etc.

EVALUATION

1. Define an ecosystem.
2. State the components of an ecosystem.
3. Explain the interdependence within an ecosystem.

ENVIRONMENTAL BALANCE

Environmental balance refers to the ways of recycling matter and the flow of energy within an ecosystem in order to ensure continuous supply or availability of energy.

Environmental balance is achieved through the following processes:

- (i) Hydrological (water) Cycle
- (ii) Carbon Cycle
- (iii) Nitrogen Cycle
- (iv) Mineral or Nutrient Cycle
- (v) Food Chain and Food Web.

GENERAL EVALUATION QUESTIONS

1. What does the word 'Interdependence' mean?
2. What is environmental balance and how is it achieved?
3. What is an environment?
4. State the spheres of the environment.
5. Explain the lithosphere.

WEEKEND ASSIGNMENT

1. The liquid portion of the earth is called _____
(a) Hydrosphere (b) Biosphere (c) Atmosphere
2. Animals, man and parasites are grouped as _____
(a) Decomposers (b) Heterotrophs (c) Autotrophs
3. The relationship between organisms and its physical environment is called _____
(a) Environment (b) Ecosystem (c) Community
4. The best example of autotrophs are _____
(a) Animals (b) Man (c) plants
5. One of these is not a way an environmental balance is achieved
(a) Food chain (b) Water cycle (c) Sand cycle



THEORY

1. What is an ecosystem?
2. Mention four importance of the environment.

WEEK SIX AND SEVEN

TOPIC: WEATHER AND CLIMATE

Weather is defined as the condition of the atmosphere of a place at a certain time or within a short period. The weather of a place is always very brief and changes regularly e.g. the weather of a day could be sunny, rainy or cloudy etc.

Climate is defined as the average atmospheric condition of an area over a **long period** of time. Unlike weather, climate of a place lasts for a very long time before it can change.

Elements of Weather and Climate

The elements of weather and climate include:

- | | |
|-----------------------|------------------|
| (i) Temperature | (ii) Rainfall |
| (iii) Wind | (iv) Pressure |
| (v) Relative humidity | (vi) Cloud cover |
| (vii) Sunshine | |

Climate varies from one part of the world to another due to the effects of the following factors:

- | | |
|-------------------------------------------|--------------------------------|
| 1. Latitude | 2. Altitude |
| 3. Continentally or distance from the sea | 4. Ocean currents |
| 5. Planetary winds and pressure belts | 6. Slope and aspect |
| 7. Cloud cover | 8. Natural vegetation and soil |

Evaluation Questions:

1. What is weather?
2. Differentiate between weather and climate.

Importance of weather and climate to man

1. Human settlement: Weather and climate affect the rate at which human being live in a place.
2. Health: Humid or damp environment encourage the growth of micro-organisms which cause diseases hence, death rate is higher in the tropical region than in the temperate countries.
3. Environment hazards: Hazards like soil erosion, rain storm, flood and drought are caused by differences in weather and climate.
4. Vegetation: Temperature and rainfall are the major determinant of the type of vegetation in an area which could be light or thick.
5. Clothing: The type and nature of clothing worn by different people in different part of the world is due to the differences in climate. Cold climate requires black and thick dresses while hot climate requires light dresses.
6. Housing: The type and nature of houses built in different places is also influenced by differences in climate. E.g. hot region requires air-condition houses whereas, polar region do not.



7. Agriculture: Rainfall and temperature are important elements that determine the type of crops to be cultivated in an area.
8. Soil Formation: Soil is formed from parent rocks which have been broken by elements of weather and climate. The rate of disintegration of rocks to form soil is principally a factor of climate.
9. Communication and Transportation: The type of transportation used in an area is greatly influenced by weather and climate.
10. Occupation: The climate of a place does determine the occupation of the people in that particular region. E.g. People living in equatorial type of climate are more likely to be involved in cash crop farming and lumbering of hardwood.
11. Cultural Activities: The climate of a place can also affect the cultural activities of some people e.g. winter or summer sports.
12. Health: The health status of a particular area can be determined by the type of climate. The sub –tropical climate is said to favour the breeding of mosquitoes, which causes malaria fever.

Evaluation Questions:

1. Mention any four elements of weather and climate.
2. State any three importance of weather and climate to man.

KEEPING WEATHER RECORDS AND INSTRUMENTS

Measurement of Rainfall

An instrument called **Rain-gauge is used in** measuring rainfall.

Description: A rain gauge consists of a metal funnel that leads to a glass bottle enclosed within a copper cylinder .The gauge is usually erected high above the ground to avoid splashing and it is sited far away from buildings and tall trees that might shelter it. The rain gauge must be examined every day and daily records taken. Record is taken by removing the funnel and the contents of the glass bottle are emptied into the measuring cylinder.

Formula

- (1) Mean monthly rainfall =
$$\frac{\text{Add total rainfall for the month}}{\text{No of days in the month}}$$
- (2) Annual rainfall = Add the total rainfall (Jan-Dec)
- (3) Annual range of rainfall
 = Month with highest rainfall - month with lowest rainfall
- (4) Mean annual rainfall =
$$\frac{\text{Total rainfall (Jan- Dec)}}{12}$$
- (5) Highest rainfall = Month with the highest rainfall
- (6) Lowest rainfall = Month with the lowest rainfall

Example: Calculate (i) month with the lowest rainfall (ii) month with the highest rainfall (iii) annual rainfall (iv) annual range of rainfall (v) mean annual rainfall using the table below:

Month	J	F	M	A	M	J	J	A	S	O	N	D
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Rainfall	10	80	20	18	5	50	45	40	90	20	50	40
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Solutions

- Month with the lowest rainfall = May (5cm)
- Month with the highest rainfall = September (90 cm)
- Annual rainfall = Total rainfall for 12 months.
= 10 + 80 + 20 + 18 ... + 50 + 40 = 468 cm
- Annual range of rainfall = 90 - 5 = 85 cm
- Mean annual rainfall =

$$\frac{\text{Total rainfall for 12 months}}{12} = \frac{468}{12} = 39 \text{ cm}$$

Measurement of Temperature

An instrument called **Thermometer** measures the temperature of a place.

Description: The thermometer is a narrow glass tube filled with mercury or alcohol. It works on the principle that mercury and alcohol expand when heated and contract when cooled. Temperature is commonly recorded in centigrade ($^{\circ}\text{C}$) or Fahrenheit ($^{\circ}\text{F}$) scale. The freezing (lowest) point for centigrade scale is 0°C while Fahrenheit is 32°F . The boiling (or highest) point for centigrade scale is 100°C while that of the Fahrenheit is 212°F . It is possible to convert from one scale to another.

Geographers are interested in shade temperatures which is the temperature of the air to exclude the intensity of the sun's radiant heat. To get accurate records, thermometers are kept in a standard shelter called **Stevenson Screen** to protect it from the effects of radiant heat of the sun and rain. The Stevenson screen is a wooden box raised above the ground to a height of 4ft or 1.2m. To measure the maximum and minimum temperatures of the day, a combined **maximum and minimum thermometers** are used.

Calculations:

Formulae

- Mean daily temperature = $\frac{\text{Max. temp.} + \text{Mini temp. for a day}}{2}$
- Diurnal range of temperature = Max. temp – Mini. Temp that day
- Monthly range of temperature = Difference between the hottest and the coldest daily temperature for the month.
- Annual temperature = temperature of the hottest month - temperature of the coldest month.
- Annual temperature = Total temperature (Jan – Dec)
- Mean Annual Temperature = $\frac{\text{total temp (Jan – Dec)}}{12}$

Example: Calculate using the table below

- The month with the highest temperature
- The month with the lowest temperature
- Annual range of temperature
- Annual temperature
- Mean annual temperature

Month	J	F	M	A	M	J	J	A	S	O	N	D
Tem.($^{\circ}$)	40	30	21	25	10	40	48	30	25	30	20	15



Solutions

- (i) Month with the highest temperature = July (48°C)
(ii) Month with the lowest temperature = May (10°C)
(iii) Annual range of temperature = temp of the hottest month – Temp of coldest
 $= 48^{\circ}\text{C} - 10^{\circ}\text{C}$
 $= 38^{\circ}\text{C}$
(iv) Annual temperature = $\frac{\text{Total temp. (Jan - Dec)} = 40 + 30 + 21}{+ \dots + 30 + 20 + 15}$
 $= 334^{\circ}\text{C}$
(v) Mean annual temperature = $\frac{\text{Total temp. (Jan - Dec)}}{12}$
 $= \frac{334}{12}$
 $= 27.8^{\circ}\text{C}$

Measurement of Wind

Wind has **direction and speed**. The **direction** of wind is measured by an instrument called **Wind Vane** while the **speed** of the wind is measured by a different instrument called **Anemometer**.

Description: (a) Wind vane: wind vane is made up of two parts – one part is the arrow or vane on the top, which is free to move with the prevailing wind. The other part is stationary and consists of a frame and four compass points. The vane or arrow points to the direction from which the wind is blowing so that wind is named from the direction it blows eg South West Wind blows from South West direction. Wind vane is located in an exposed position so that tall buildings and trees do not deflect the wind direction.

(b) Anemometer: This consists of three or four semi-circular cups attached to the ends of horizontal spokes mounted on a high vertical spindle. As the wind blows, the cups rotate. The higher the speed of the wind, the greater the speed of the cups and vice versa.

Measurement of pressure

The instrument used in measuring atmospheric pressure is called **Barometer**. Pressure is measured in unit of force called millibars A normal atmospheric pressure shows a reading of 760mm (76cm) or 1013 millibars. Mercury barometer consists of a beaker in which a glass tube is dipped and both contain mercury. Another instrument used for measuring pressure is the **aneroid barometer**. But a modified aneroid barometer used in aeroplanes is called **Altimeter**.

Measurement of Relative Humidity

The instrument used for measuring relative humidity is called **Hygrometer**.

Description: The hygrometer consists of **wet and dry-bulb thermometers** placed side by side in the **stevenson screen**. The dry bulb is an ordinary thermometer that measures the shade temperature. The wet-bulb is kept by a wick that is dipped in a container of distilled water. When the air is not saturated, evaporation, which produces a cooling effect, takes place from the moist wick. The wet bulb always shows a lower reading than the dry bulb. The difference in the two readings, **if high, indicates low humidity** and **if low, indicates high humidity**. If there is **no difference** in their readings, **it means that the air is saturated** and therefore, the relative humidity would be 100 %.

Evaluation Questions:

How do we calculate:

1. Annual range of temperature?



2. Mean annual range of temperature?
3. Mean monthly rainfall?

General Evaluation Questions:

1. What is weather and climate?
2. Explain the importance of weather and climate.
3. Mention the instrument used for measuring rainfall.
4. Mention the three types of rock.
5. Explain the mode of formation of igneous rock.

Reading Assignment

Read on weather and climate in Essential Geography Pgs. 75-77

Weekend Assignment

1. The height of a place above the sea level is known as (a) Latitude (b) Altitude (c) Lapse rate (d) Spot height
2. Which of these factors does not affect weather and climate (a) Cloud cover (b) Humidity (c) Latitude (d) Natural Vegetation
3. The instrument used for measuring wind direction is (a) Wind vane (b) Thermometer (c) Anemometer (d) Rain guage
4. Wet and dry bulb thermometer could be used for measuring (a) Rainfall (b) Relative humidity (c) Temperature (d) Wind speed
5. Which of the following weather elements is paired with the wrong instrument? (a) Wind direction and wind vane (b) Humidity and anemometer (c) Rainfall and rain guage (d) Atmospheric pressure and barometer

Theory

1. What is Climate?
2. Highlight four importance of weather and climate to man.

WEEK EIGHT

TOPIC: COMPONENTS 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 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.

SOURCES OF GEOGRAPHIC DATA

1. Satellite images
2. Existing maps
3. Land survey



4. Socio-economic statistical records
5. Aerial photographs
6. Field work or survey

COMPONENTS OF GIS

Geographic Information System has five key components which are:

- Hardware e.g keyboard, CPU, mouse, hard disk e.t.c
- Software e.g Microsoft word, corel draw, Microsoft excel, computer games e.t.c
- Data
- People: these are the people who design and maintain the system and they also develop plans for applying it.
- Method: A successful GIS operates according to a well-designed plan and business rules.

GENERAL EVALUATION QUESTIONS

1. What is GIS?
2. Mention two features that can be represented with GIS.
3. Give examples of hardware.
4. What is software?
5. Define geography.

WEEKEND ASSIGNMENT

1. Real objects can be divide 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 NINE

TOPIC: INTRODUCTION TO MAP READING

Map reading aspect of geography is often referred to as Practical Geography. Map work or map reading involves the ability to recognize conventional signs on a map and using the signs to interpret the map.

A map is a representation of the earth's surface as it is seen from above on a paper. A large area of land e.g. town, village or even a whole country can be represented on one page of paper.

Maps are of different types. They include (i) Topographical Maps (ii) Atlas Maps (iii) Plan Maps and (iv) Sketch Maps

MAP SCALE:

The Scale of a map indicates the relationship between the distance of two points on a map and the actual distance on the ground. That is, map scale is the ratio, proportion or relationship between measurement on the map and the actual measurement on the ground. If



the scale of a map is 2cm to 1km, it means that two centimeters on a map represent one kilometer on the ground.

TYPES OF SCALE: We have three types of scale. They include Statement scale, Linear scale and Representative scale.

A) Statement Scale

This is a scale that is given in form of a statement and figures e.g 1cm to 2km (means 1cm on the map represents 2km on ground), 2cm to 1km (means 2cm on map is equal to 1km on ground).

Question: If the scale of a map is 2cm to 1km, what is the ground distance if the distance between two towns, on the map is 10cm?

Solution

Map distance = 10cm

Ground distance =?

Map scale = 2cm to 1km

Since 2 cm = 1km

$10 \times 1 = ?$

$10 \times 1 = 2 \times x$ (cross multiply)

$10 = 2x$

$\therefore x = \frac{10}{2} = 5\text{km}$

Evaluaton Questions:

1. Explain map work.
2. What is a scale?
3. State the types of scale.

B) Linear Scale: This is a line drawn to represent the relationship between the distances on the map and that of the actual distance on the ground. Linear scale is divided into two parts: primary divisions and secondary divisions. The primary division is the major division on the right side while the secondary division is the minor division on the left.

HOW TO USE LINEAR SCALE

- (i) Measure the distance between the two places requested on the map either with a ruler or a thread.
- (ii) Take the distance measured in cm or inches to the scale and begin the measurement from the Origin marked zero (0) and stretch it to the right (Primary division). Where it ends represents the distance on the ground either in km or in miles.
- (iii) If the length is longer than the scale, first record the distance where the scale ends and then measure the remaining part again starting from zero (0) to the right and finally mark where the distance ends. Later add the first measurement with the last one.
- (iv) If any fraction is left which is far smaller than the major division, such fraction is taken to the Secondary division starting from zero (0) to the left. This length is finally added to the first.

C) Representative Fraction: Here, the scale is expressed in form of a fraction or ratio. Thus, the distance on the map is the numerator and is always one (1) while the denominator stands for the distance on the ground. Both the numerator and the denominator are in the same unit.



E.g. 1: 100,000 1: 50,000 1: 200,000 etc

Note: 1: 100,000 is the same as 1 cm to 1km while 1:50,000 is the same as 2cm to 1km or 1cm to $\frac{1}{2}$ km

How to use Representative Fraction

- (i) Note the two places involved
- (ii) Measure the distance between the two places
- (iii) Relate the distance measured to the scale

Question: If the scale of a map is 1:50,000, What is the ground distance if the distance between two towns on the map is 10cm?

Solution

Map distance = 10cm

Ground distance = ?

Map scale = 1:50,000

= 1cm = $\frac{1}{2}$ km

: 10cm = 5km

Ans = 5km

SIZE OF A SCALE

The size of a scale may be large or small

A) Small Scale Map: This shows a large area but cannot include a great amount of details. Only very important features are shown.

The larger the denominator of a scale, the smaller the scale E.g. 1:1,000,000 1:2,000,000,

1:250,000 etc

B) Large Scale Map: This shows a small area but with more details of the area and also important features are shown. The smaller the denominator of a scale, the larger the scale e.g. 1:5,000, 1:250 and 1: 20 etc

Evaluaton Question

Arrange the following scales in descending order: 1: 50,000 1:20,000 1: 200
1:3 000,000 1:500,000

General Evaluation Questions:

1. What is a map scale?
2. Mention the three types of scale.
3. Scale: 1:25,000 in R.F is equal to..... in statement?
4. Explain the mode of formation of sedimentary rocks.
5. Give two examples of sedimentary rock.

Reading Assignment

Read on introduction to map work in Essential Geography Pgs. 157-160.

WEEKEND ASSIGNMENT

1. Another name for map reading is___ (a) Map job (b) map work (c) map assignment (d) map shadow
2. One of these is very vital in map reading (a) paper (b) atlas (c) conventional signs (d) pencil
3. 6km to 10km is a type of _____ (a) statement scale (b) representative scale (c) linear scale (d) representative fraction



4. If the scale of a map is 5cm to 2km, what is the ground distance if the distance between two towns on the map is 15cm?(a) 5km (b) 6km (c) 7km (d) 8km
5. Which of these scales is the smallest? (a) 1: 50,000 (b) 1: 25,000 (c) 1: 10,000 (d) 1 : 100,000

THEORY

Convert (1) 1: 50,000 and (2) 1: 150,000 to statement scales.

WEEK TEN

TOPIC: MAP DISTANCES

Distance on a map is the interval between two points on a map. It can either be straight or curved.

MEASUREMENT OF STRAIGHT DISTANCES

- (i) Locate the places involved on the map.
- (ii) Use long ruler to measure the distance between the two points or places.
- (iii) Relate the distance measured on the map to the scale given and get the ground distance.

MEASUREMENT OF CURVE DISTANCES

This can be done through three methods:

- (i) The use of a pair of divider.
- (ii) The use of a piece of thread.
- (iii) The use of straight edge of a paper.

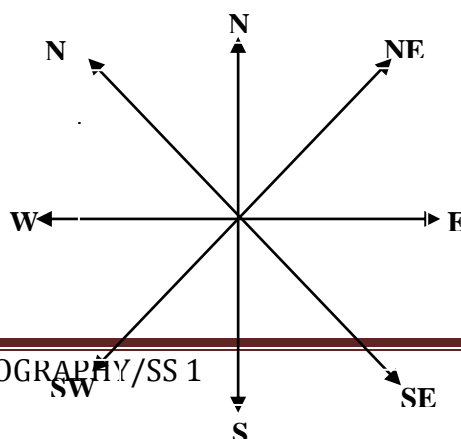
Among the three methods, the easiest and the best is the use of thread.

Use of a piece of thread: Stretch a piece of white thread along the route or curve that is to be measured gradually, carefully and accurately. Carefully follow the curve and do not allow the thread to move out of the curve. Mark the end of the distance on the thread with a biro or a pencil and transfer it to the linear scale or calculate the distance in statement or R.F Scale.

Evaluation Questions:

1. What is a distance?
2. How do we measure distance on map?

DIRECTION: The direction of one place or object from another is expressed by means of compass points or cardinal points. There are 4 cardinal points namely: North, South, East and West. But for better accuracy in the measurement of direction, eight cardinal points are used. These include North, North-East, North-West, South, South-East, South-West, East and West.





PROCEDURES FOR MEASURING DIRECTION

- (i) Locate the two places involved on the map.
- (ii) Place your four cardinal points at the location or places given.
- (iii) Use your ruler to join the place you wish to find its direction from the location or reference point.
- (iv) The cardinal point on that line or near it is the direction.

BEARING: The location of one place from another is described as its bearing.

Bearing is expressed in degrees using a protractor, measured from North in a clockwise direction.

Procedures for Measuring Bearing

- (i) Locate the two places involved on the map.
- (ii) Place your four cardinal points at the reference point because you are looking for the bearing of the other town.
- (iii) Use your ruler to join the two places.
- (iv) Place your protractor on the side of the line and the degrees which falls on that line represents the bearing.

Evaluation Questions

1. Differentiate between location and bearing.
2. Explain the method of measuring bearing.

General Evaluation Questions:

1. What is bearing?
2. How can you measure a curved distance?
3. Draw the four cardinal points.
4. Describe the shape of the earth.
5. State four proofs of earth sphericity.

Reading Assignment

Read on measurement of direction and bearing in Essential Geography Pgs. 163-164

WEEKEND ASSIGNMENT

1. The interval between two points on the map is known as (a) bearing (b) distance (c) grid system (d) cardinal points
2. One of these is not used for measuring distance (a) straight edge of a paper (b) ruler (c) nylon (d) thread
3. The first step in the calculation of straight distance is? (a) locate the places involved on the map (b) use a ruler to measure the distance between the two points or places (c) relate the distance measured on the map to the scale given and get the ground distance (d) use a thread to get the distance
4. The cardinal interval between North and East is (a) North – South (b) North – West (c) West – South (d) North – East
5. The cardinal interval between East and South is (a) North – South (b) East – South (c) South - East (d) North – East



THEORY

1. State the procedures for measuring bearing.
2. Draw the four cardinal points.