Geography of Ethiopia and the Horn

Bishoftu Campus

By Kedir A

Quiz

1. Define geography?
2. Write 4 countries in the Horn of Africa
3. What are the 5 themes in geography?
4. Write the two types of maps?

Key

1. 4 countries in the Horn of Africa: Djibouti, Eritrea, Ethiopia and Somalia
2. What is geography: social or natural or both, holistic and interdisciplinary
3. 4 spheres of geography: atmosphere, biosphere, hydrosphere and lithosphere
4. Two divisions of geography: human and physical
5. Continua in geography: physical and human, topical/systematic and regional
6. 5 themes in geography: location, place, movement, human-environment interaction and region
7. 2 location (ar), 2 places (hn), 3 movement (hgsii), 3 relationship (mad)

Geography of Ethiopia and The Horn



Geography is

- a holistic and interdisciplinary field of study contributing to the understanding of the changing spatial structures from the past to the future
- A science that explains the arrangements of various natural and cultural features on the Earth surface

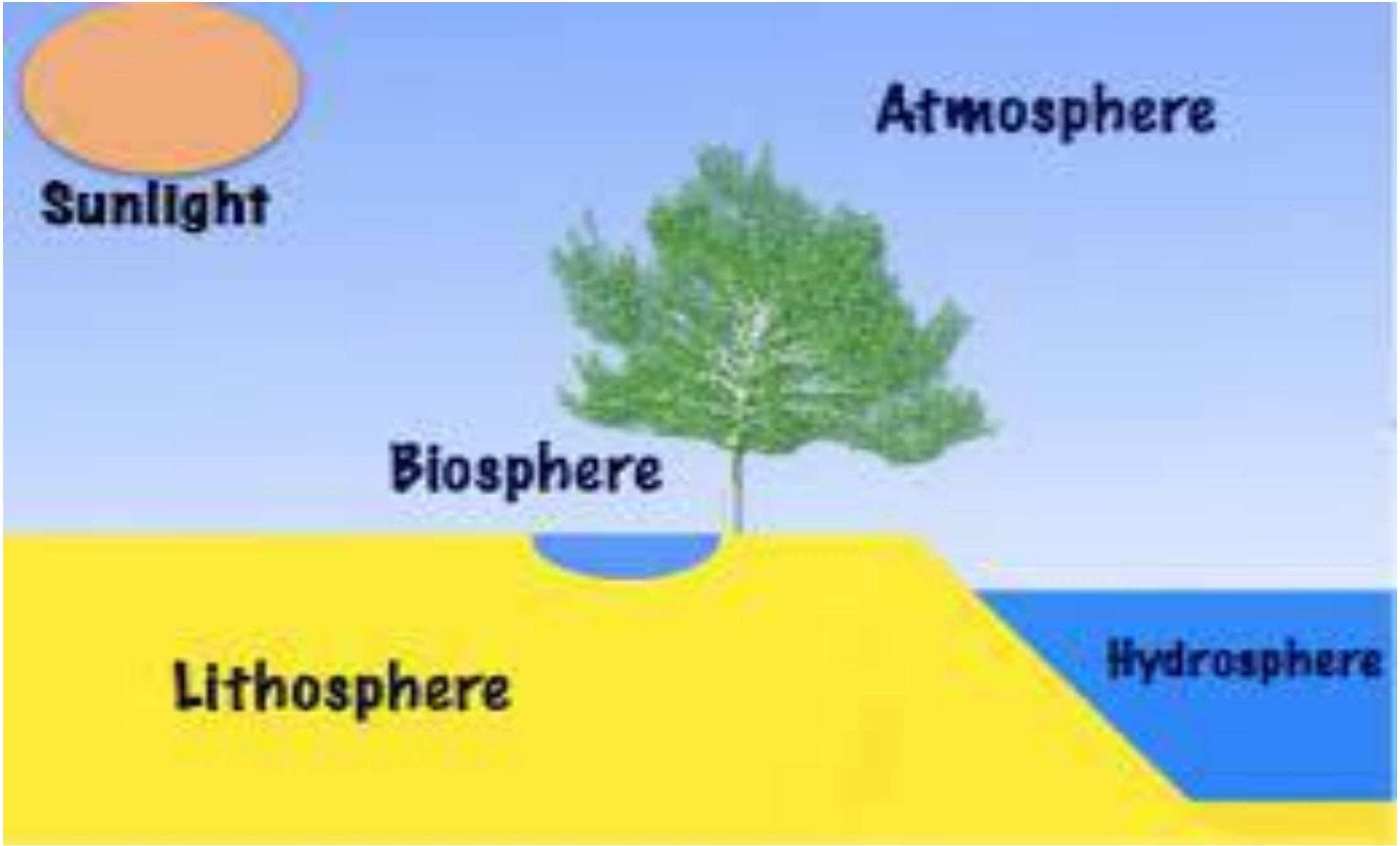
What is Geography?

- Geography is the study of the earth's landscapes, peoples, places and environments. It is, quite simply, about the world in which we live.
- Geography is unique in bridging the social sciences (human geography) with the natural sciences (physical geography).Human geography concerns the understanding of the dynamics of cultures, societies and economies, and physical geography concerns the understanding of the dynamics of physical landscapes and the environment.

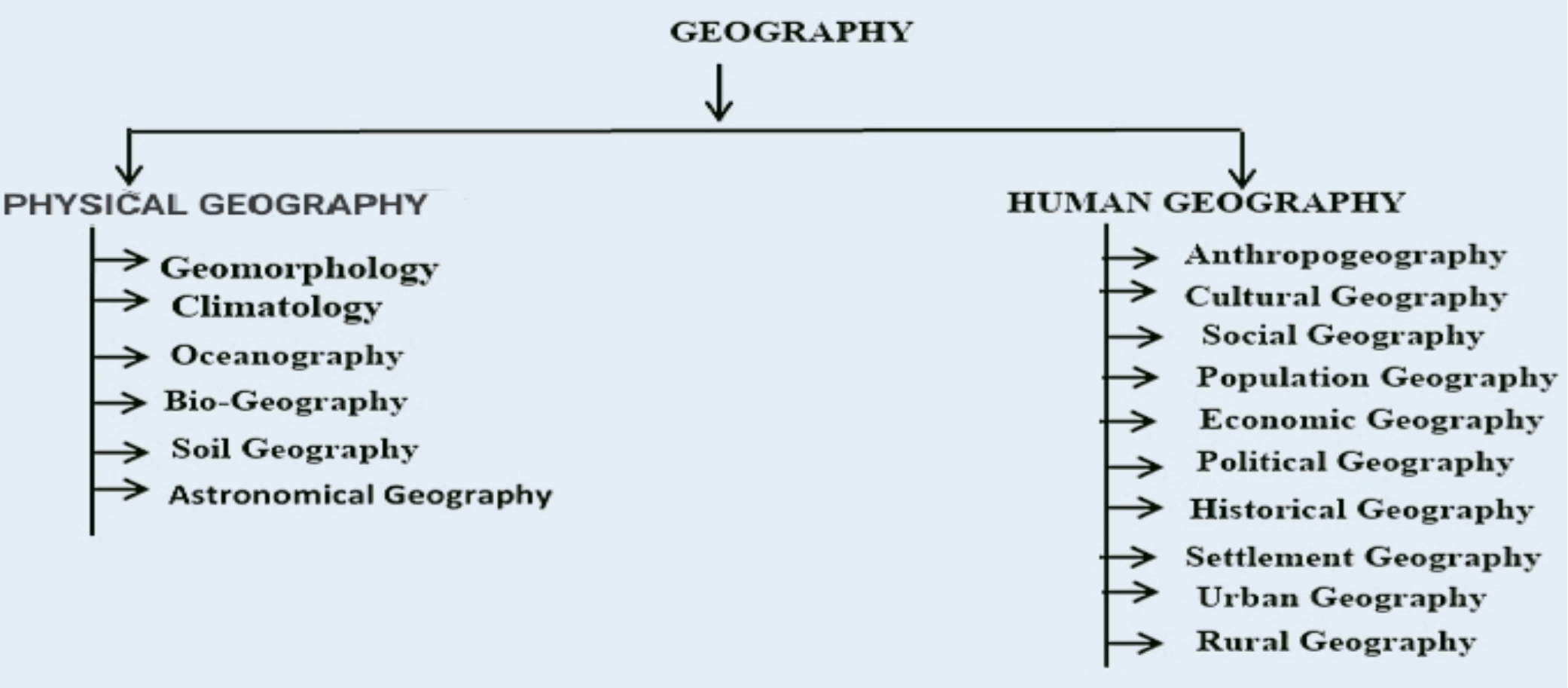
Working definition of Geography

Geo-earth graphia- to write about

Geography is the scientific study of the Earth that describes and analyses spatial and temporal variations of physical, biological and human phenomena, and their interrelationships and dynamism over the surface of the Earth.


Sunlight
Atmosphere
Biosphere
Lithosphere
Hydrosphere

Two branches of geography



Systematic vs. Regional Geography

There are two basic approaches to the study of world geography.

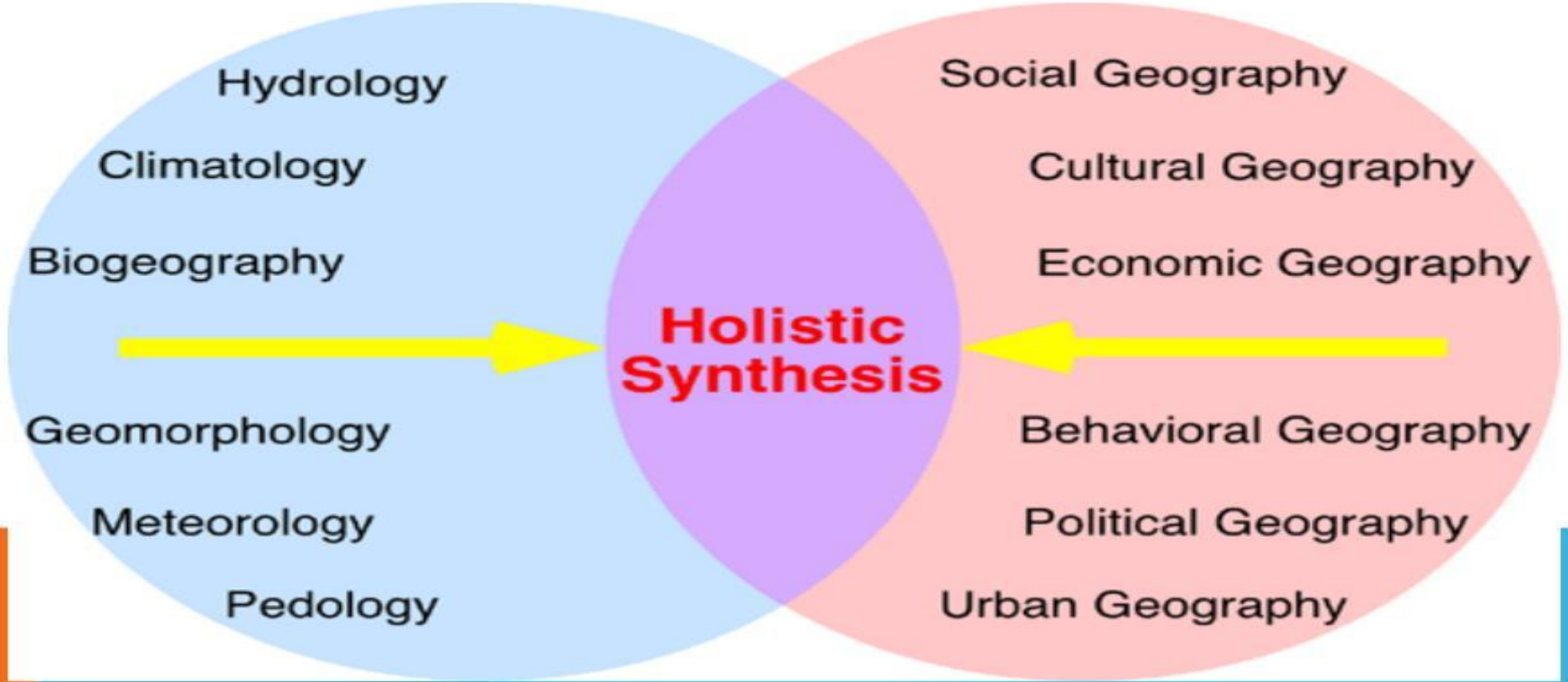
1) The regional approach studies all of the characteristics of a place that set it off from and relate it to other places in the world. This is the approach of your textbook and the main approach used in this course.

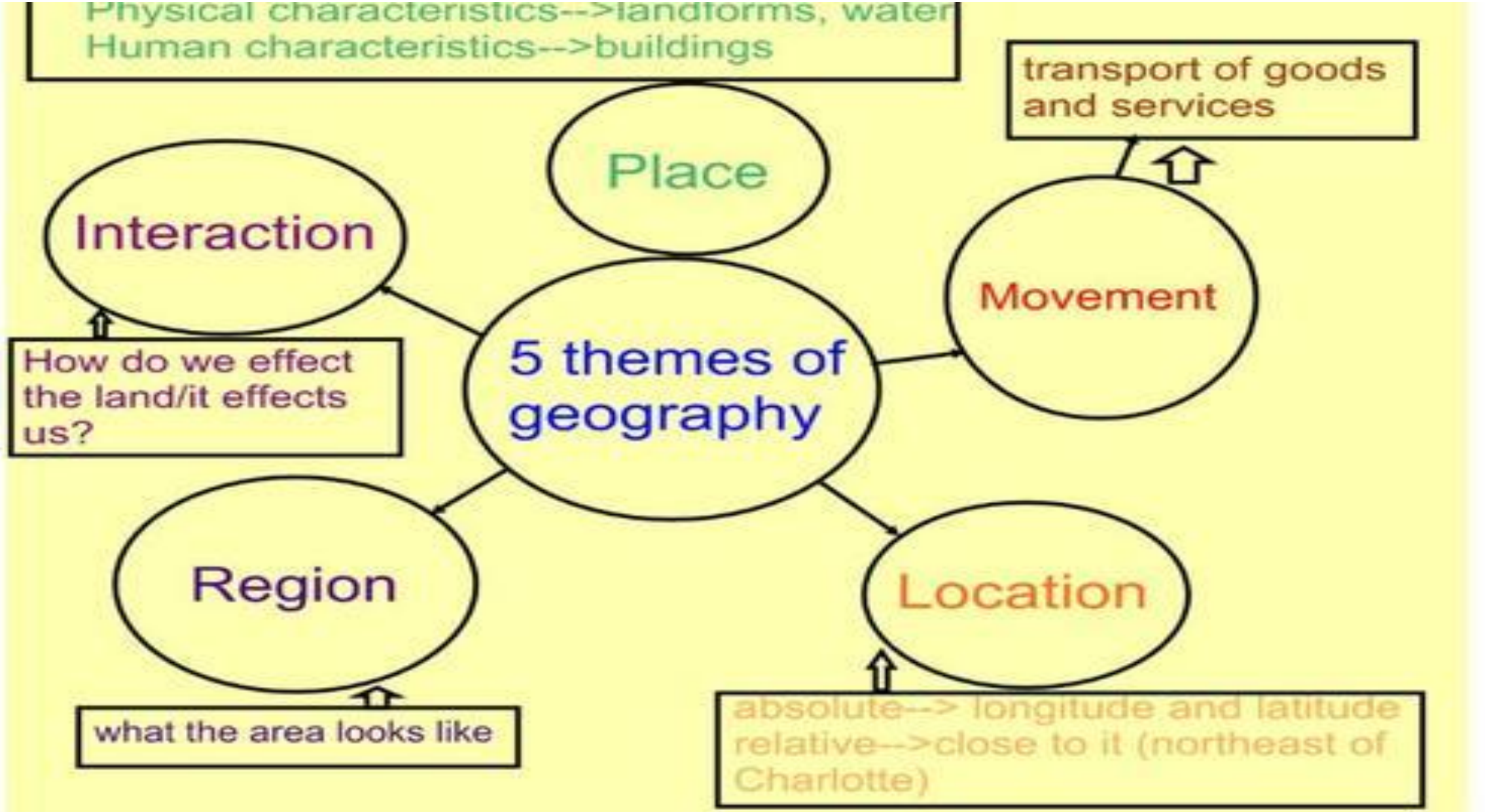
2)Systematic geography, on the other hand, studies one issue at a time and looks at its variations in all parts of the globe. College courses in systematic geography include: physical geography, geomorphology, analysis of soils, climatology, environmental studies, human geography,

Systematic vs Regional approach

- There are mainly two approaches to geography: systematic approach and regional approach.
- The systematic approach studies only one issue and continues to examine its spatial variations. That means related to different spaces, you study your location.
- Regional approach studies the multiple characteristics after dividing or segmenting the location at hand, on the basis of region. Meaning you divide your location into regions, next you study characteristics of each region.

THE CONTINUUM OF GEOGRAPHY



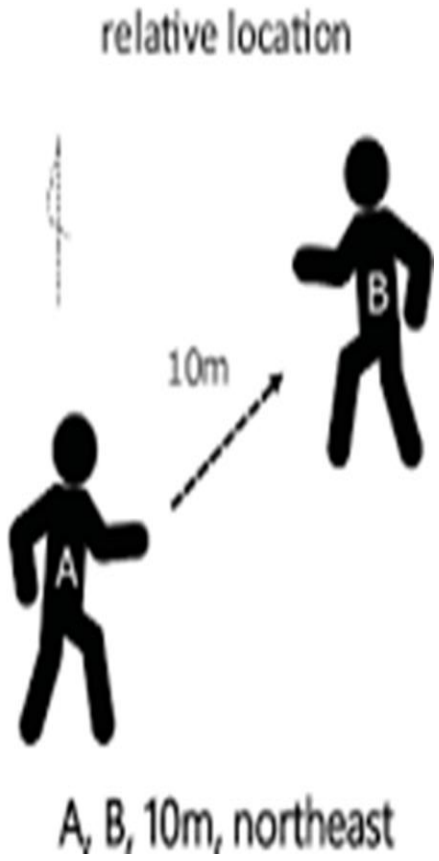

Physical characteristics-->landforms, water
Human characteristics-->buildings
Place
Interaction
How do we effect the land/it effects us?
5 themes of geography
Movement
transport of goods and services
Region
what the area looks like
Location
absolute--> longitude and latitude
relative-->close to it (northeast of Charlotte)

1. Location- particular place or position. Where are we?

Two Types of location:

- absolute location- latitude, longitude or easting and northing
- relative location- relative to another place

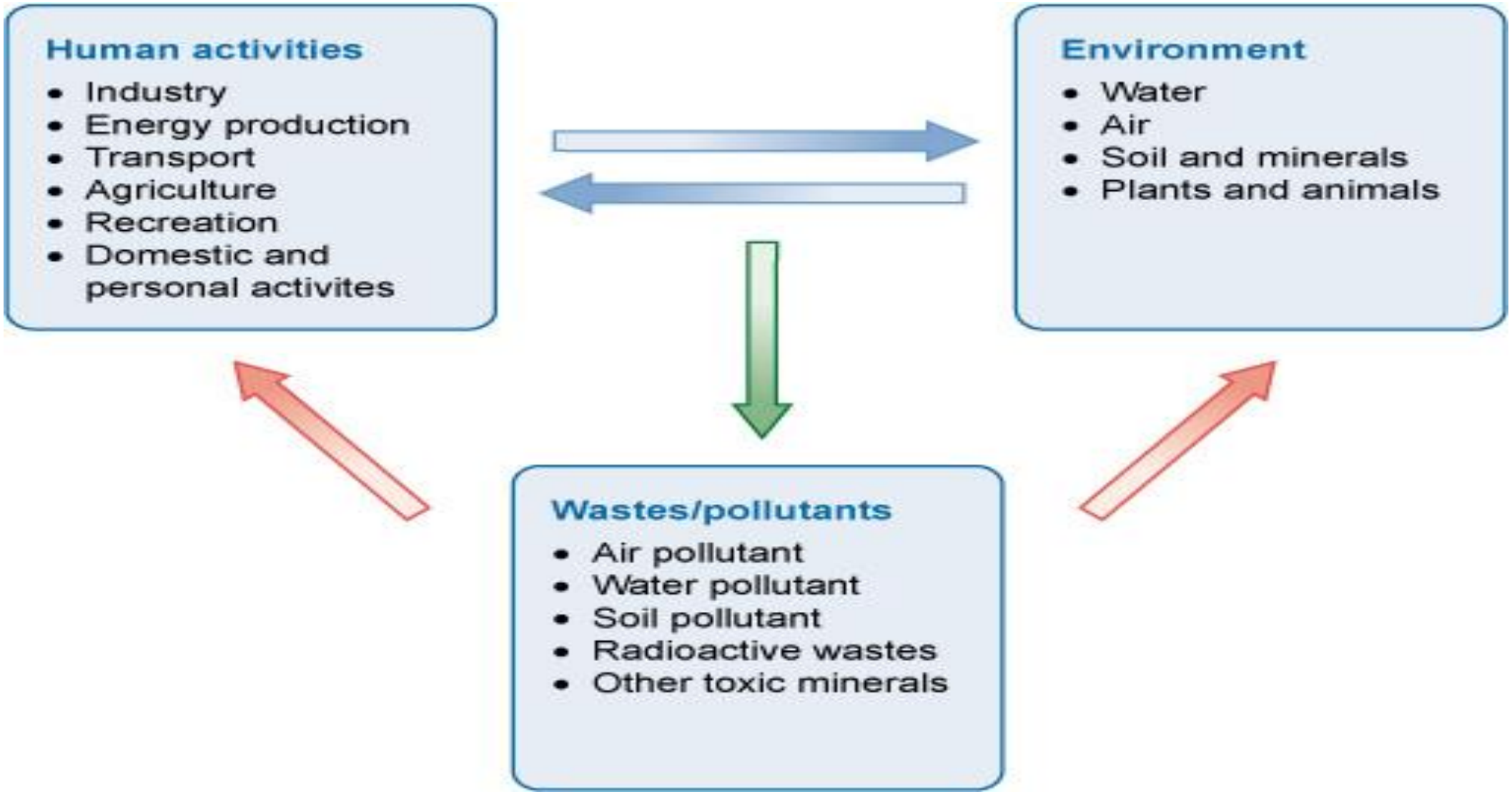




2. Place-what is it looks there? (natural & human features)

- Refers to the physical and human aspects of a location.
- This theme of geography is associated with toponym
  - (the name of a place),
  - site (the description of the features of the place),
  - situation (the environmental conditions of the place).
- Each place in the world has its unique characteristics expressed in terms of landforms, hydrology, biogeography, pedology, characteristics and size of its human population, and the distinct human cultures.

3- relationship (human – environment interaction)



3 distinct aspects of human-environment interaction (mad)

- Dependency refers to the ways in which humans are dependent on nature for a living.
- Adaptation relates to how humans modify themselves, their lifestyles and their behavior to live in a new environment with new challenges.
- Modification allowed humans to “conquer” the world for their comfortable living.

HUMAN-ENVIRONMENT INTERACTION

- How do humans and the environment affect each other?
  - We depend on it.
    - People depend on the Tennessee River for water and transportation.



  - We modify it.
    - People modify our environment by heating and cooling buildings for comfort.



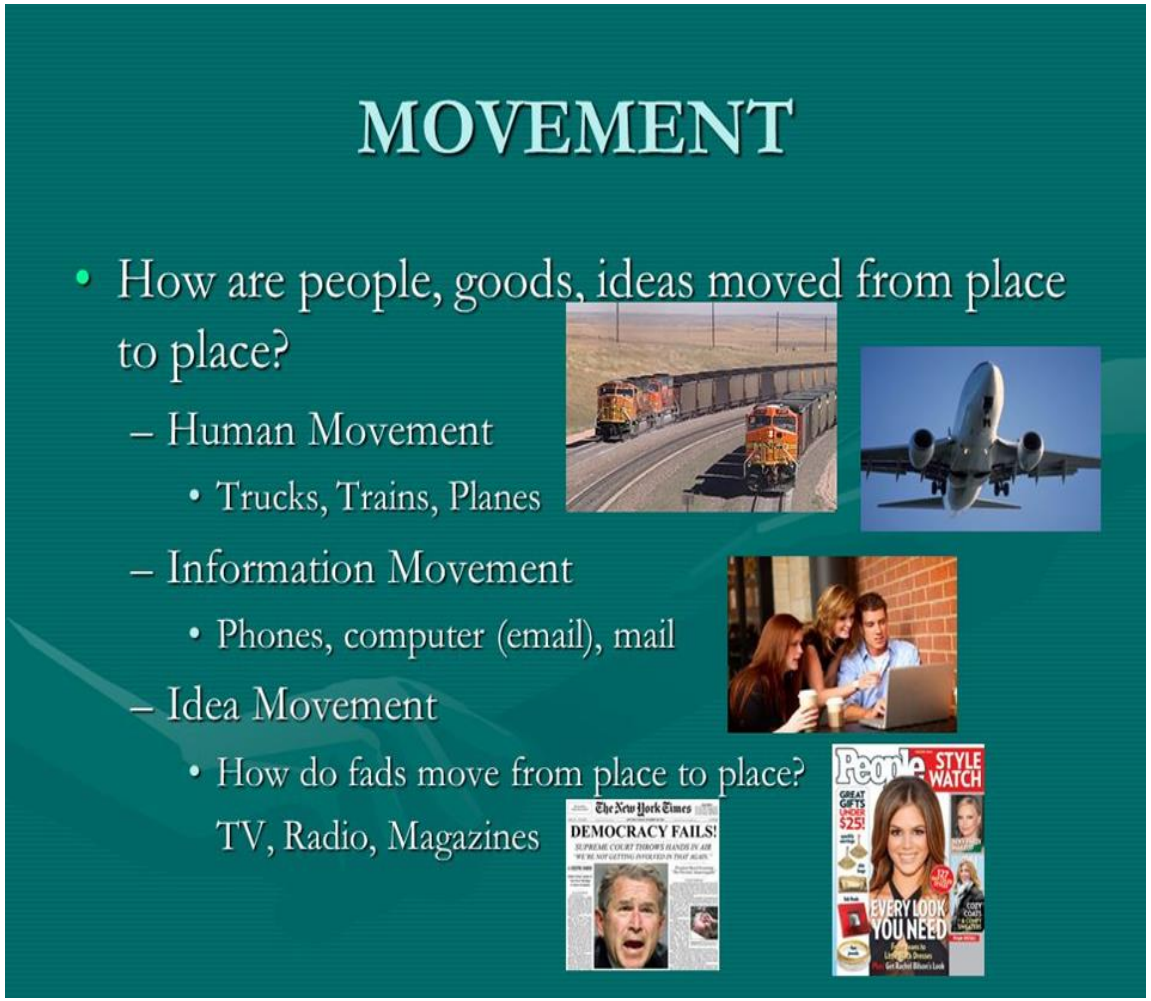
  - We adapt to it.
    - We adapt to the environment by wearing clothing suitable for summer (shorts) and winter (coats), rain and shine.



4. Movement

Movement entails to the translocation of

- human beings,
- Goods and series
- Ideas and information from one end of the planet to another.



5. Region

- is an area that is defined by certain similar characteristics. Those unifying or similar characteristics can be physical, natural, human, or cultural.

Summary https://www.youtube.com/watch?v=Y-L82sM5UOY

Theme	Questions
Location 	**Where is it?** - What is its absolute location? - What is its relative location?
Place 	**What is it like there?** - What are its natural characteristics? - What are its human characteristics?
Human/Environment Interaction 	**How do people interact with the environment?** - How have people used the environment? - How have people adapted to the environment? - How have people modified or changed the environment?
Movement 	**How is the place connected to other places?** - How and why have people, goods, and ideas moved in and out of the place?
Regions 	**How might common geographic characteristics help us understand this place?** - How can the place be divided into regions? - To what regions does the place belong?

Group Assignment(5 %)

- Location of Ethiopia and its implications- Group One
- Size of Ethiopia and its implications- Group two
- Shape of Ethiopia and its implication

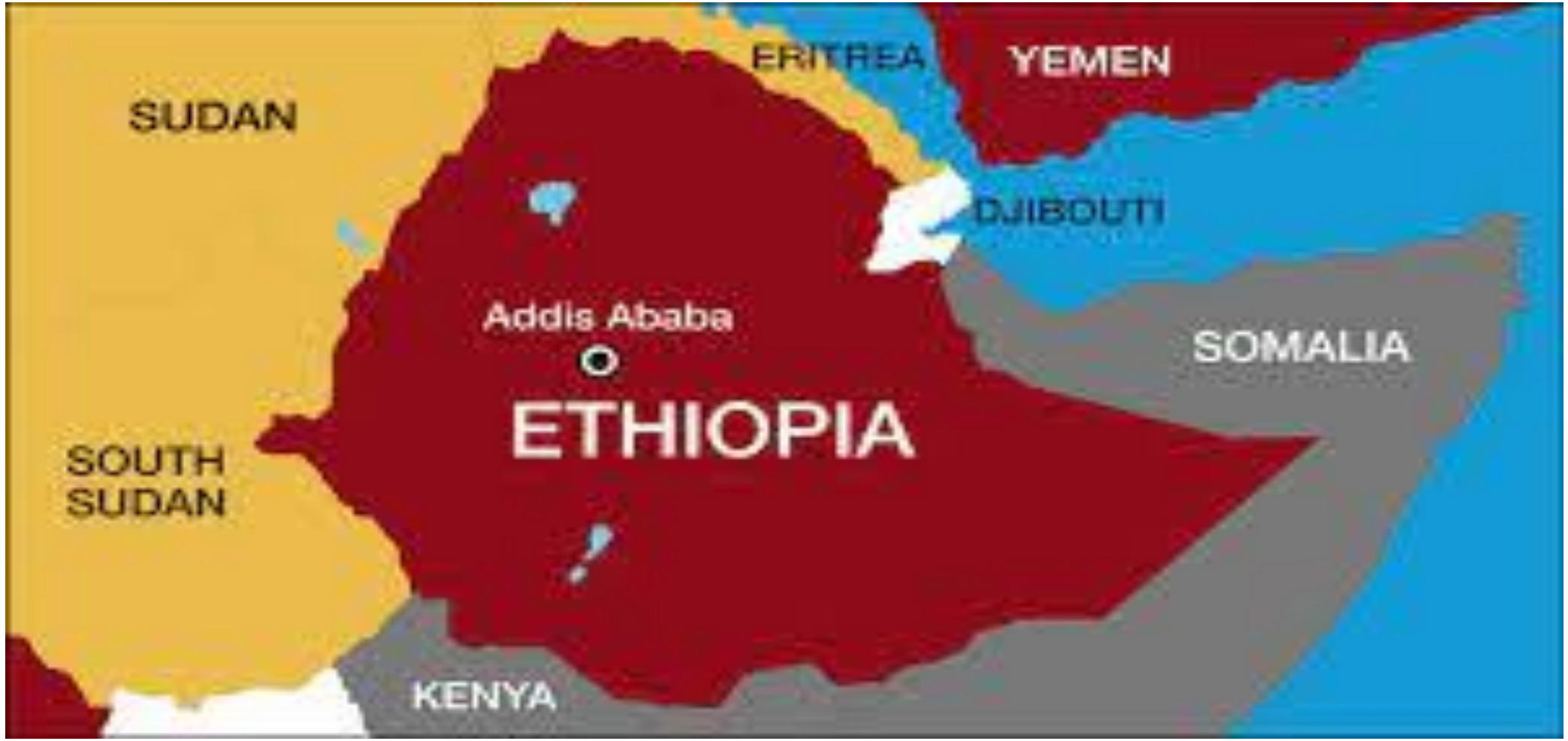
Rules

- All members must work together
- Members who did not participate will be reported
- Any member will be asked to present the group work
- Send it to kesheda@gmail.com

Horn of Africa

- **is** region of eastern Africa. It is the easternmost extension of African land
- for the purposes of this article is defined as the region that is home to the countries of Djibouti, Eritrea, Ethiopia, and Somalia,
- whose cultures have been linked throughout their long history.
- Other definitions of the Horn of Africa are more restrictive and exclude some or all of the countries of Djibouti, Eritrea, and Ethiopia.
- There are also broader definitions, the most common of which include all the countries mentioned above, as well as parts or all of Kenya, Sudan, South Sudan, and Uganda.
- Part of the Horn of Africa region is also known as the Somali peninsula

Location of Ethiopia



- Absolute

- 3N (Moyale) -15N (Bademe) - the northernmost tip of Tigray latitudes
- 33E (Akobo) to 48E (the tip of Ogaden in the east) longitudes.

- Relative

Vicinal location	In relation to water bodies & land masses
➲ Sudan to the west and northwest ➲ South Sudan to southwest ➲ Djibouti to the east ➲ Somalia to the east and southeast ➲ Eritrea to the north and northeast	➲ In the Horn of Africa ➲ Southwest of the Arabian Peninsula ➲ South of Europe ➲ Northwest of the Indian Ocean ➲ In the Nile Basin

Implications of location

A. Climate:

The fact that Ethiopia is located between 3N and 15N (between the Equator and Tropic of Cancer) implies that the country has a tropical climate, though modified by its altitude.

The location of Ethiopia relative to the Indian Ocean, the Atlantic Ocean and the African and Asian landmass has also various bearings on the climate of Ethiopia.

B. Socio-cultural:

Ethiopia is one of the earliest recipients of the major world religions namely Christianity, Islam and Judaism due to its proximity to the Middle East, which was the origin of these religions. The linguistic and other cultural relationships, which Ethiopia shares with its neighbors, reflect the influence of location.

C. Political:

- Geopolitical considerations of superpowers.
- Adjacency to the Red Sea (a major global trade route).
- The Middle East geopolitical paradigms.

Size of Ethiopia

- The country occupies an area of approximately 1,127,127 square km., which is slightly less than twice the size of Texas.
- The total land area is 1,119,683 square km
- The area occupied by water bodies is 7,444 sq. km.
- The Ethiopian border is 5,311 km long.

Why Shape of a country?

- Controls the length of its boundaries with other states.
- Shape affects the potential for communication and/or conflict with neighbors.
- Shape is part of a state’s identity.
- Shape can determine the difficulty or ease of internal administration and social unity.

Types of shape of a country

- A country's boundaries, as well as the shape of the land it encompasses, can present problems or help to unify the nation.
- The morphology of most countries can be divided into five main categories:
  - compact,
  - fragmented,
  - elongated,
  - perforated,
  - protruded.

Measures of Indices of Compactness (5%)

- Area-Area ratio
- Area- boundary ratio
- Area- Circumference (circling around) or perimeter of a circle ratio
- Boundary- Circumference ratio

Basic map reading skills

What is a map?

What are benefits of maps?

What are the types of maps?

What are marginal information in maps?

What is a map?

- A map is a two-dimensional scaled representation of part or whole of the Earth surface on a flat body such as piece of paper, black board, wood or cloth.
- Geographer use more maps than other discipline to show the spatial distribution of physical and man made features on the earth surface.
- Maps are primary tools for geographers unlike for other disciplines

IMPORTANCE OF MAP:

a) Used for strategic, tactical planning in all command.
b) Used to show the relative position on a certain given area.
c) Used to show accurate distance, location, best routes and key terrain features.
d) To avoid lost and keep alive.

Types of maps based on their purpose

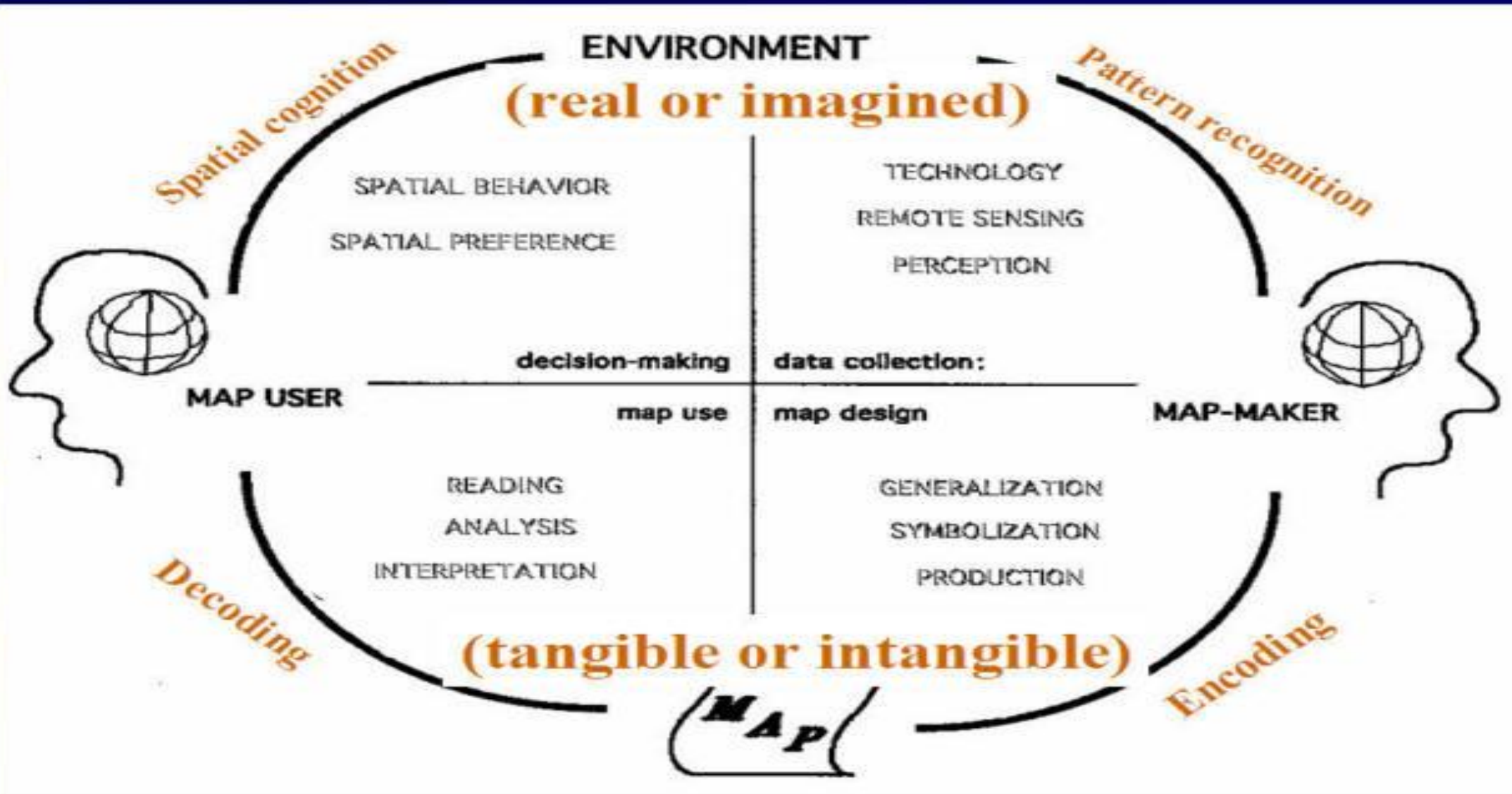
Topographical maps: Topographic maps depict one or more natural and cultural features of an area. They could be small, medium or large scale depending on the size of the area represented.

Special purpose/statistical maps: These are maps, which show distribution of different aspects such as temperature, rainfall, settlement, vegetation etc.

Marginal informations

1. Title- heading of the map
2. North direction- reference to measure other directions
3. Scale – map distance/ground distance. Indicates amount of reduction
4. Key/legend- symbols and signs shown on the map with their interpretation.
5. Margin- frame of the map
6. Date of compilation: Publication date. Recent version is preferable

Cartographic Process



Chapter Two: GEOLOGY OF ETHIOPIA AND THE HORN

- Geology is an Earth science that studies the evolution of the earth, the materials of which it is made of, and the processes acting upon them.



PERMIAN
250 million years ago



TRIASSIC
200 million years ago



JURASSIC
145 million years ago



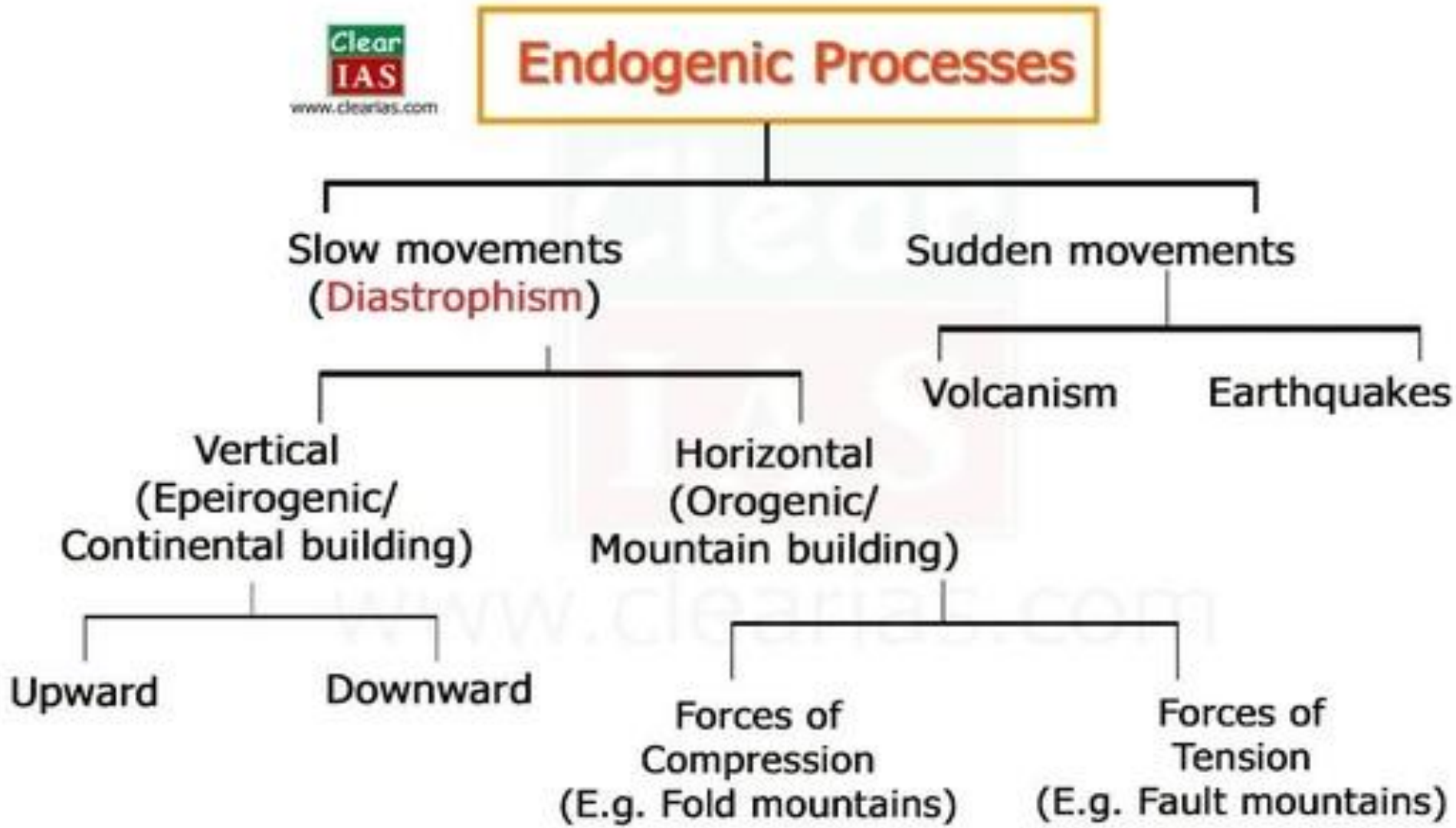
CRETACEOUS
65 million years ago



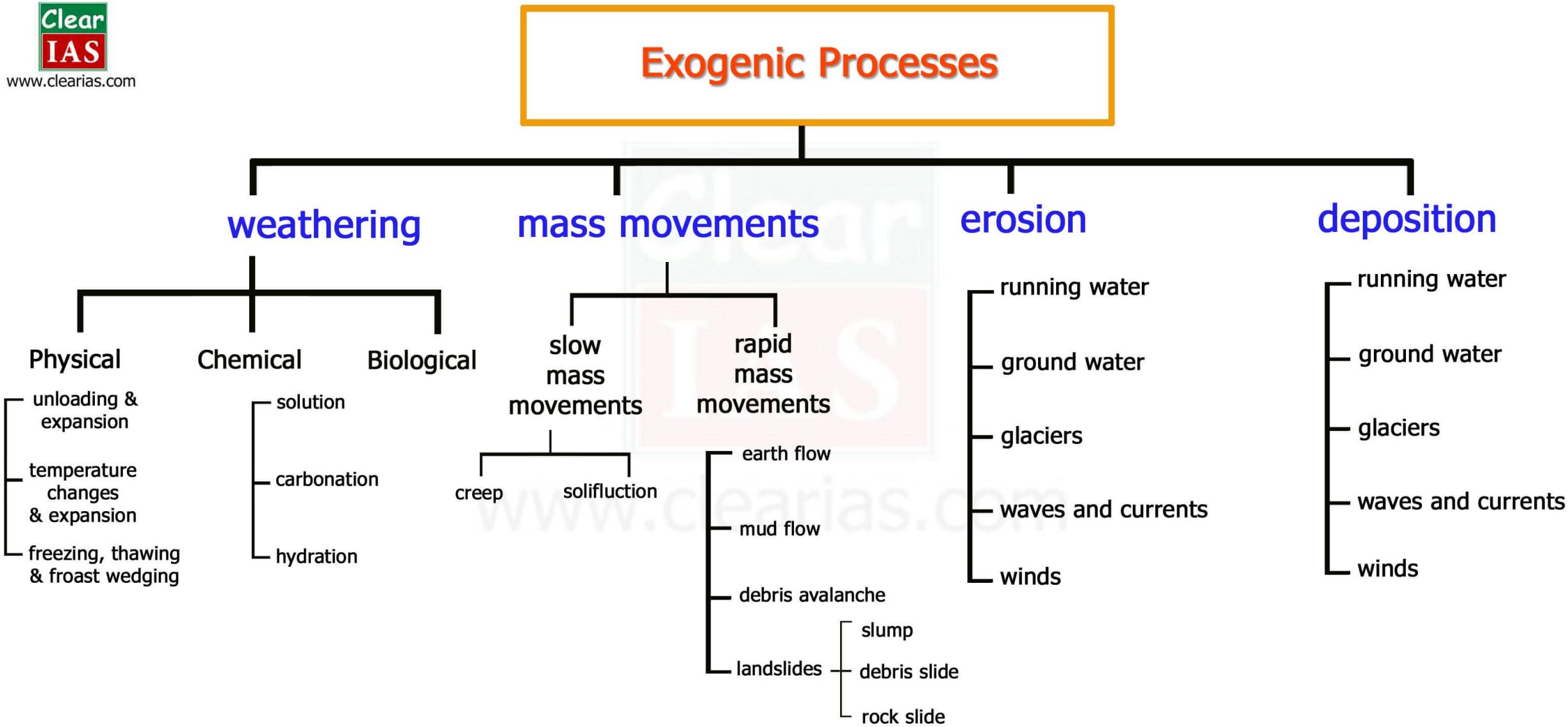
PRESENT DAY

Evidence for continental drift

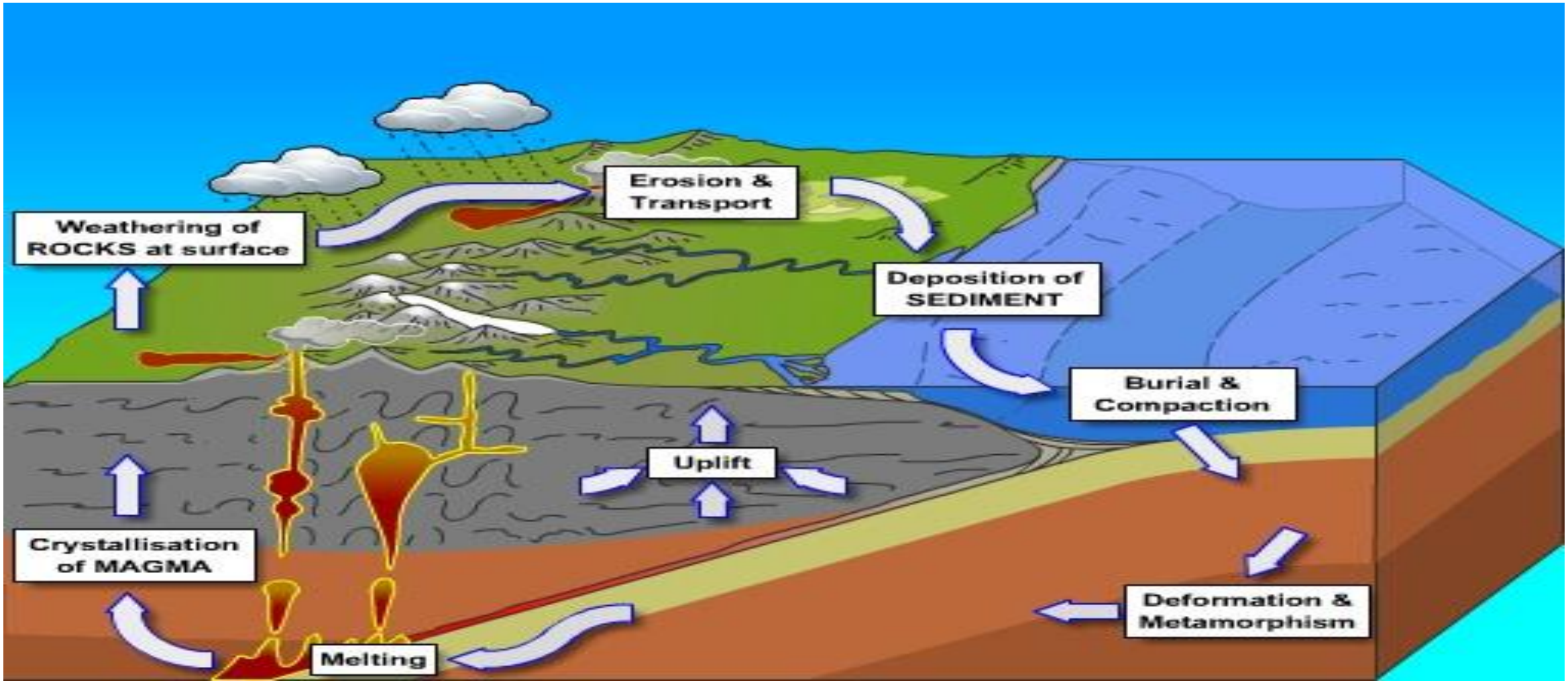
- ***Fit of the continents:*** The opposing coastlines of continents often fit together.
- ***Match of mountain belts, rock types:*** If the continents are reassembled as Pangaea, mountains in West Africa, North America, Greenland, and Western Europe match up.
- ***Distribution of fossils:*** The distribution of plants and animal fossils on separate continents forms definite linked patterns if the continents are reassembled.
- ***Paleoclimates:*** rocks formed 200 million years ago in India, Australia, South America, and southern Africa all exhibited evidence of continental glaciations


Clear IAS
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Endogenic Processes
Slow movements (Diastrophism)
Sudden movements
Volcanism
Earthquakes
Vertical (Epeirogenic/ Continental building)
Horizontal (Orogenic/ Mountain building)
Upward
Downward
Forces of Compression (E.g. Fold mountains)
Forces of Tension (E.g. Fault mountains)

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Geologic processes: endogenic and exogenic



Eras- life existed

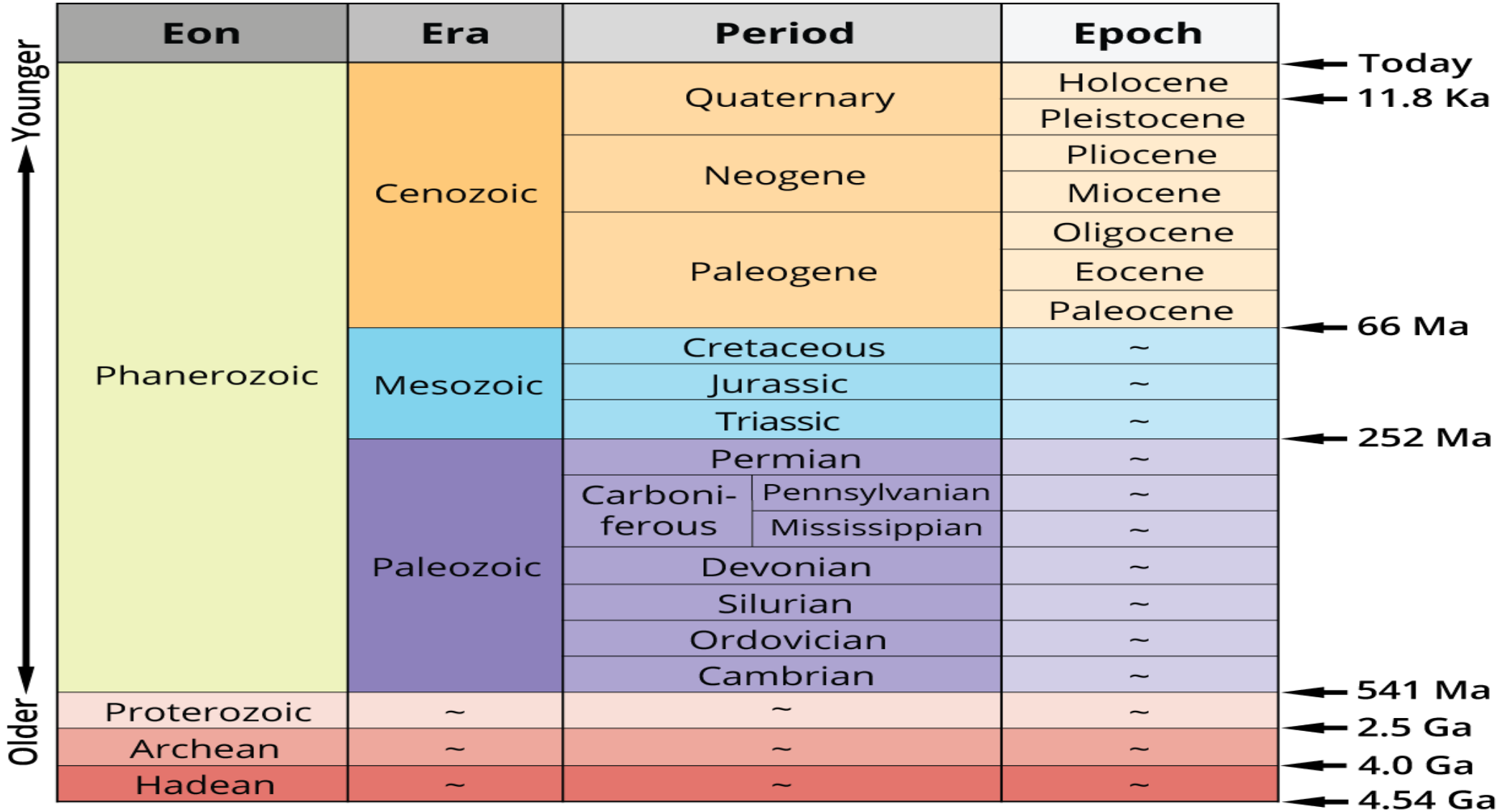
- The Cenozoic Era (recent life) is the age of mammals.
- The Mesozoic Era (the middle life) is the age of reptiles
- The Paleozoic Era (ancient life) is the age of invertebrates,

Geological time division

1. relative position of land and sea,
2. the kind of climate
3. animal and plant life that developed and existed during that Era or period. most important factor

Geological time is difficult to measure precisely.

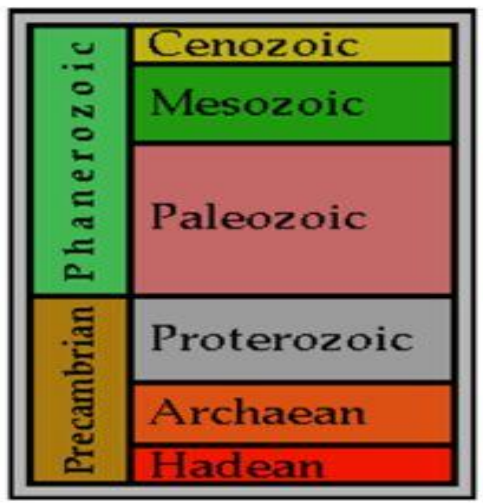
Geological Time Scale



GEOLOGIC TIME SCALE

What do the divisions of the geologic time scale signify?

Eons Eras



Divisions of Geologic Time

Eon, Era, Period, Epoch

Largest span of time

Smallest span of time

https://youtu.be/phZeE7Att_s

Radioactive Dating

- Explanation: Geologists use radioactive dating to determine the absolute ages of rocks. In radioactive dating, scientists first determine the amount of a radioactive element in a rock. Then they compare that amount with the amount of the stable element into which the radioactive element decays.



Absolute dating techniques

- *Carbon-14 Technique:* Upon the organism's death, carbon-14 begins to disintegrate at a known rate, and no further replacement of carbon from atmospheric carbon dioxide can take place. Carbon-14 has half-life of 5730 years.
- *Potassium-Argon Technique:* The decay is widely used for dating rocks. Geologists are able to date entire rock samples in this way, because potassium-40 is abundant in micas, feldspars, and hornblendes.

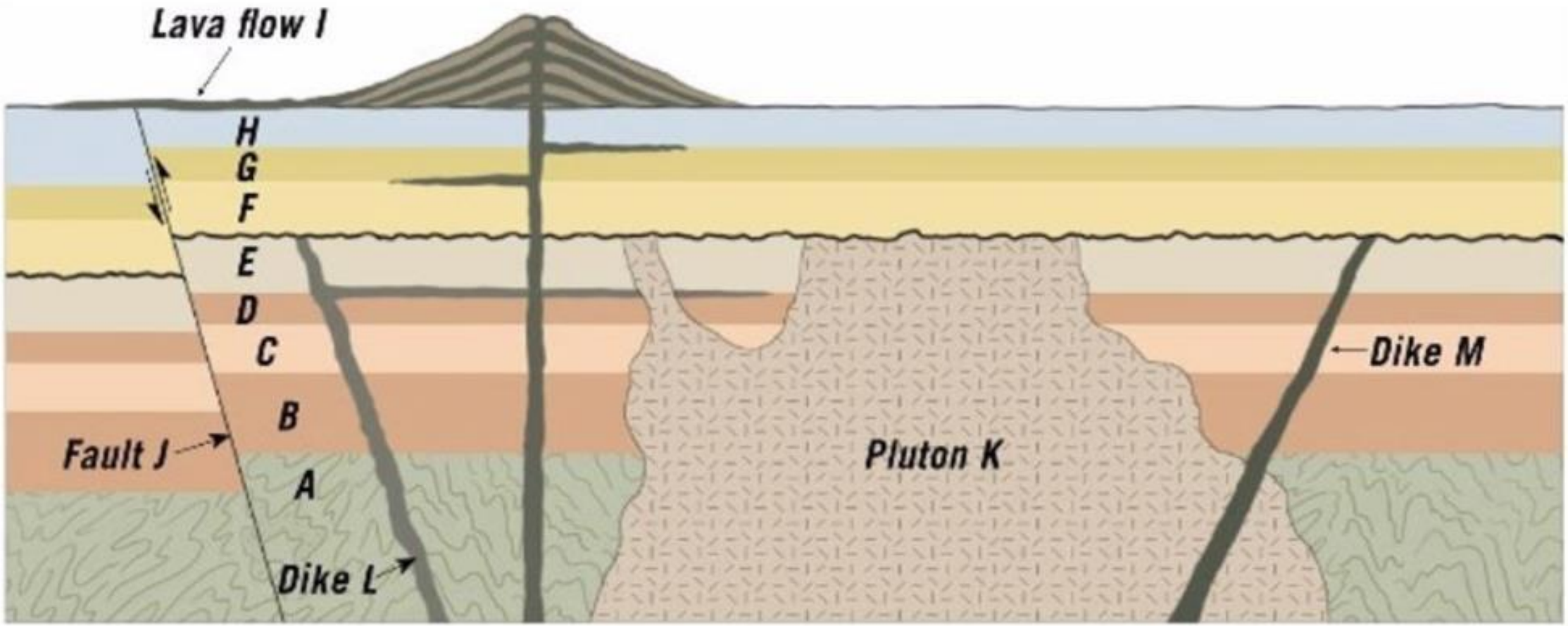
What is Geological Dating?

- It is how scientists can determine the relative age of rocks and fossils.
- They do this by looking at the strata (layers) of the rock.





From oldest to youngest, the rock sequence of this diagram is: (only one is correct)



Dating Past Geologic Events

- Relative Dating
  - Example:
    - On the way home I stopped for gas
    - First, I ate dinner
    - I drove home
    - Then I went to the store
- Absolute Dating
  - Example
    - I drove home at 5:35
    - I stopped for gas at 5:25
    - I ate dinner at 5:00
    - I went to the store at 5:15

ABSOLUTE DATING
VERSUS
RELATIVE DATING

ABSOLUTE DATING	RELATIVE DATING
A technique used to determine the exact age of the artefact or a site using methods such as carbon dating	A technique used to determine which object or item is older in comparison to the other one
Determines the numerical age	Arranges fossils in an order
Four methods are radiometric dating, amino acid dating, dendrochronology, and thermoluminescence	Involves biostratigraphy, stratigraphy, and cross dating
Precision is high	Precision is low
Quantitative measurement	Qualitative measurement
Works better for igneous and metamorphic rocks	Works better for sedimentary rocks having layered arrangement of sediments
Expensive and takes time	Less-expensive and efficient

Visit www.PEDIAA.com

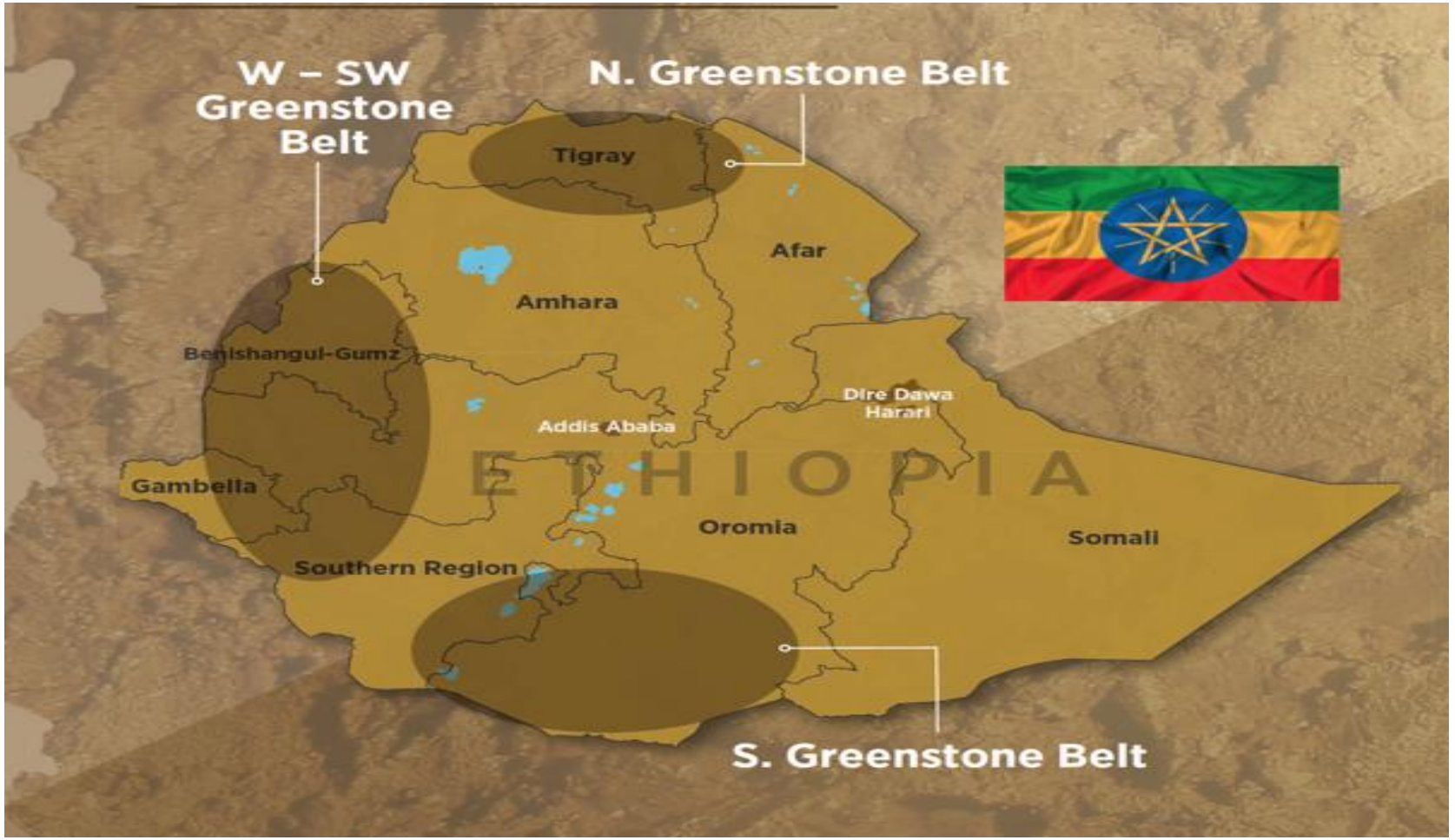
Main Minerals in Ethiopia

- Geological surveys proved that Ethiopia has abundant mineral resources of metals and precious metals, coal, and industrial minerals.
- Ethiopia, the land of Opportunity for Mining and Petroleum Investors-MoMP

Distribution of key minerals in Ethiopia

SN	Type of mineral	Major areas of its locaiton
1	Gold	Benishangul-Gumuz (Metekel) and Adola. Operating mines produce gold from primary sources in such localities as Dermi-dama, Sakoro and Lega-dembi.
2	Platinium	Yubdo area in Wellega
3	Tantalum	Southern Ethiopia- Adola area Kenticha (17,000 metric tone)
4	Gemstone	Walda Delanta in Northern Wello
5	Potash	Danakil (Dallol in Afar region
6	Gypsum and Anhydrite	Danakil Depression, Ogaden, Shewa, Gojjam, Tigray, and Hararghe.
7	Clay	Adola, Abay gorge, and the Rift Valley lakes region
8	Marble	West of Mekelle and south of Adwa in Tigray. In the east in Galetti, Soka, Ramis, Rochelle, Kumi and other valleys of Chercher Mountain in West Hararghe.Precambrian schist in Gonder, and the Dabus River and other neighboring river basins in Benishangul-Gumuz and Gojjam.
9	Construction stones	Dire Dawa, Muger Valley, Abay gorge (Dejen), Tigray (Messebo)

3 major mineral greenstone belts in Ethiopia



Chapter Three: THE TOPOGRAPHY OF ETHIOPIA AND THE HORN

- The Ethiopian landform is characterized by great diversity. There are flat-topped plateaus, high and rugged mountains, deep river gorges and vast plains.
- Altitude ranges from 125 meters below sea level (Kobar Sink) to the highest mountain in Ethiopia, Mount Ras Dashen (4,620 m.a.s.l),which is the fourth highest mountain in Africa.
- More than 50% of the Ethiopian landmass is above 1,000 meters of elevation;
- and above 1,500 meters makes 44% of the country.
- Half of this, in turn, is at more than 2,000 meters above sea level.

- Most of the Ethiopian Highlands are part of central and northern Ethiopia, and its northernmost portion extends into Eritrea.
- Most of the country consists of high plateau and mountain ranges that are sources of many rivers and streams that made the country to be described as the “Water Tower of East Africa”.
- Taking the 1,000 meters for the highland-lowland demarcation, one observes the following contrasting features between the Ethiopian highlands and lowlands:

Characteristics of Ethiopian highlands:

- These highlands make up nearly 56% of the area of the Ethiopia
- Moderate and high amount of rainfall (>600 mm per year).
- Lower mean annual temperature (<20°C).
- The climate is favorable for biotic life.
- Rain-fed agriculture is possible.
- Free from tropical diseases.
- subdivided into lower highland (1,000 - 2,000 m.a.s.l), which make up 35% and higher highland (>2,000 m.a.s.l) constituting nearly 22%.
- highlands have been significant throughout Ethiopian history in the economic, cultural and political life of the people

Characteristics of the Ethiopian low lands

- the remaining 44% of the Ethiopian lowlands are characterized by:
- Fewer amounts of rainfall and higher temperature.
- High prevalence of tropical diseases.
- Lower population densities.
- Nomadic and semi-nomadic economic life.
- Vast plain lands favorable for irrigation agriculture along the lower river basins.

Three major physiographic units can be identified in Ethiopia

Following the structural divisions brought about by the geologic processes of the Cenozoic Era,

1. The Western highlands and lowlands
   - Highland: Tigray Plateau, North Central Massifs, Shewan plateau or central highland and South Western highlands
   - Lowlands: Tekeze lowland, Abay-Dinder lowland, Baro lowland, and Ghibe lowland.

2. The Rift Valley

- It is a tectonically formed structural depression. It is bounded by two major and more or less parallel escarpments.
- Has physiographic sub-regions.
  - Afar Triangle,
  - the Main Ethiopian Rift,
  - the Chew Bahir Rift.

3. The South-eastern (Eastern) highlands and lowlands

- High lands
  - The Arsi-Bale-Sidama Highlands
  - The Hararghe Plateau
- The Southeastern Lowlands
  - Wabishebelle plain (60%)
  - Ghenale Plain (40%).

The Impacts of Relief on Biophysical and Socioeconomic Conditions

- The impacts of relief can be summarized by the following:
- Agricultural practices
- Relief influences farm size, shape, crop production and animal husbandry.
- Settlement pattern
- The highlands are characterized by sedentary life while lowlands are inhabited by pastoralists.
- Transportation and communication
- The difficult terrain makes infrastructure development and maintenance costly.

- The rugged topography rendered rivers less navigable due to the waterfalls.
- Hydroelectric power potential
- Altitude coupled with high rainfall created suitable conditions for hydroelectric power.
- Socio-cultural feeling
- The rugged terrain resulted in isolation of communities
- Impacts on climate
- Highlands have higher amount of rainfall and lower rate of evapo-transpiration than lowlands.
- Impacts on soil
- Steep mountain slopes provide unstable surface materials and subject to degradation.
- Impacts on natural vegetation
- Relief through its effect on climate and hydrology affect the type of natural vegetation