Geography Class 10

REVISION OF THE PREVIOUS CLASSES:(9:10 AM):

- There are both direct and indirect sources of information about the Earth's interior.
- The direct sources are mining and volcanism.
- The indirect sources include the analysis of density, seismic, gravity, etc.
- The continental crust is thicker(40-50 km) but lighter.
- The oceanic crust is thinner but heavier,
- The different layers of the earth as per chemical division are the crust, mantle, and core.
- The different layers of the earth as per physical division are lithosphere, asthenosphere, mesosphere, barry sphere, etc.
- There are five discontinuities inside the Earth:
- **I. Conrad Discontinuity**: Transition zone between SIAL and SIMA.
- **II. Mohorovicic/Moho Discontinuity**: Transition zone between the Crust and Mantle.
- **III. Repiti Discontinuity**: Transition zone between Outer mantle and Inner mantle.
- **IV. Gutenberg Discontinuity**: Transition zone between Mantle and Core.
- **V. Lehman Discontinuity**: Transition zone between Outer core and Inner core.
- Natural aggregates of minerals are called rocks.
- The rock composition is dependent upon the chemical composition of the minerals and the condition of formation like the rate of cooling of magma. etc.
- **Igneous rocks** are formed due to the cooling, solidification, and crystallization of the earth's molten material.
- **Sedimentary rocks** are formed by the solidification of sediments of original igneous, metamorphic, or other sedimentary rocks.
- **Metamorphic rocks** are the results of changes in the form of rocks through physical and chemical processes.

Earth Movements:

- Various forces from the earth's interior, as well as from outside the earth's surface cause physical stress and chemical actions on the earth's material.
- These forces bring about changes in the configuration on the surface of the earth called **Geomorphic processes.**
- Geomorphic processes result from two types of forces:

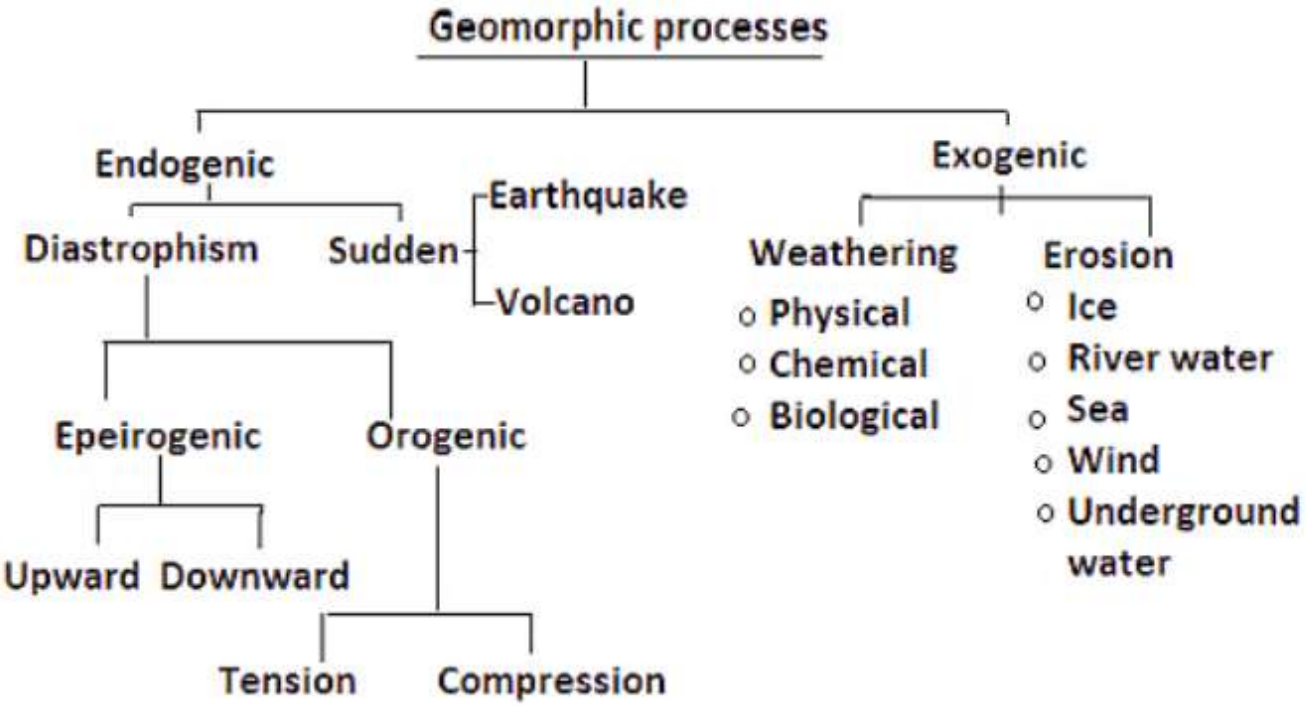
I.EXOGENETIC FORCES (9:40 AM):

- These are the forces that act on the earth's surface, from above the surface.
- They originate from outside the surface.
- Their sources of energy are sunlight and gravity.
- Wind, water, glacier, etc, are the different agents of exogenetic forces.
- Exogenetic forces cause minor topographical features like river valleys and beaches.
- Exogenetic never causes uniform movements/effects.

II.Endogenetic process:

- These are the forces that act from the earth's interior.
- The main source of energy for these processes is the **primordial heat** that is situated in the earth's interior from the time of the earth's formation.
- Another source of energy is the **radioactivity** of some radioactive minerals in the earth.
- They result in land upliftment, subsidence, folding, faulting, etc.
- They are responsible for the formation of major structural units of the earth's surface like mountains, plateaus, etc.
- Both endogenetic and exogenetic forces happen together.
- One type of process may dominate over the other for some time.

Classification of Geomorphic Processes:



Endogenetic movements:

- They are classified into dystrophic and catastrophic movements.

Catastrophic movements:

- These are unpredictable movements of shorter duration.
- **For example** Earthquakes, volcanoes, etc.

Diastrophic movements:

- These are the movements that move alleviate and build up the portions of the earth's crust.
- These movements are very slow and lead to the formation of primary landforms.
- They are of three types:
- I.Tectonic- Movements of the earth's crustal plates.
- II. Isostatic- Local rse/fall in land levels.
- III. Eustatic- Rise/Fall in seawater levels.

Tectonic movements:

- The Greek word "**Tekton** " means "to build.
- These are continent and mountain-building movements that affect the earth's surface.

The continental building movement is known as Epeirogenic movements and mountain building movements are known as Orogenic movements.

EPEIROGENIC MOVEMENTS (10:35 AM):

- These are vertical movements that cause continent formation.
- These are characterized by large-scale upliftment, subsidence, emergence, or submergence of land areas.
- These are slow movements.
- Epeirogenic forces act in **a radial** direction.
- **For example-** the upliftment of the Deccan plateau, subsidence of the northern coast of the Gulf of Mexico, etc

Orogenic movements:

- These are mountain-building movements.
- They act in a **tangential** direction.
- They involve intense folding and faulting of narrow belts.
- Orogenic forces can move toward each other.
- In this case, we will see c**ompressional forces** which will cause **folding.**
- This cause the earth's rocks to push and squeeze against each other.
- Folds are structures in which the layers are bent/distorted without the loss of continuity.
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- Orogenic movements can also act apart from each other.
- This case sees **tensional forces** which will cause **faulting.**
- Rocks are pulled apart and **faults** are made.
- Faults are the factures by which the primary rock layers are broken and displaced with the loss of continuity,
- In this case, the block mountains are formed as a result of either the rising of the block or the subsidence of the block

DIFFERENCES BETWEEN FOLD MOUNTAIN & BLOCK MOUNTAINS (11:00 AM):

Fold Mountains	Block Mountains
They are the results of folding.	They are the results of faulting
They are greater in length	They are greater in width
They are taller	They are shorter in length
Their slope is gradual	Their slope is sudden
Formed by compressional forces	Formed by both compressional and tension forces
For example the Himalayas, Aravallis. ◦ Alps in Europe. ◦ Rockies in North America. ◦ The Andes in South America. ◦ Atlas in Africa, etc.	**For example :** ◦ Black Forest in Germany, and Vosges in France.The ◦ The Rhine River rift valley is found between these two mountains. ◦ Vindhyas & Satpura mountains, and in between them lies the Narmada rift

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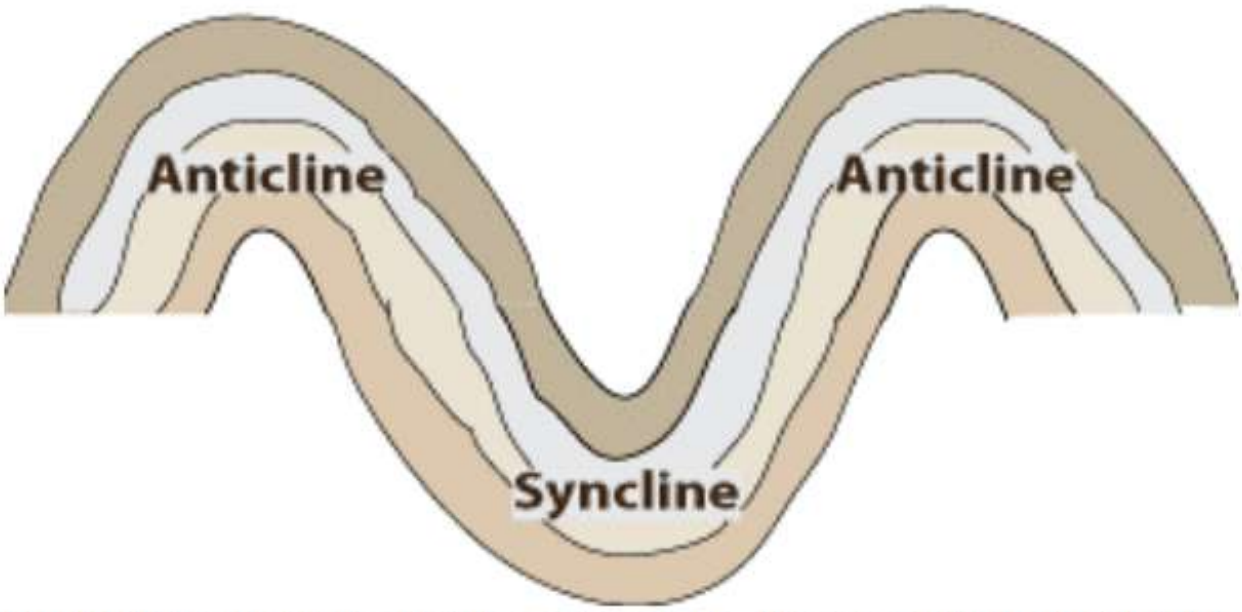
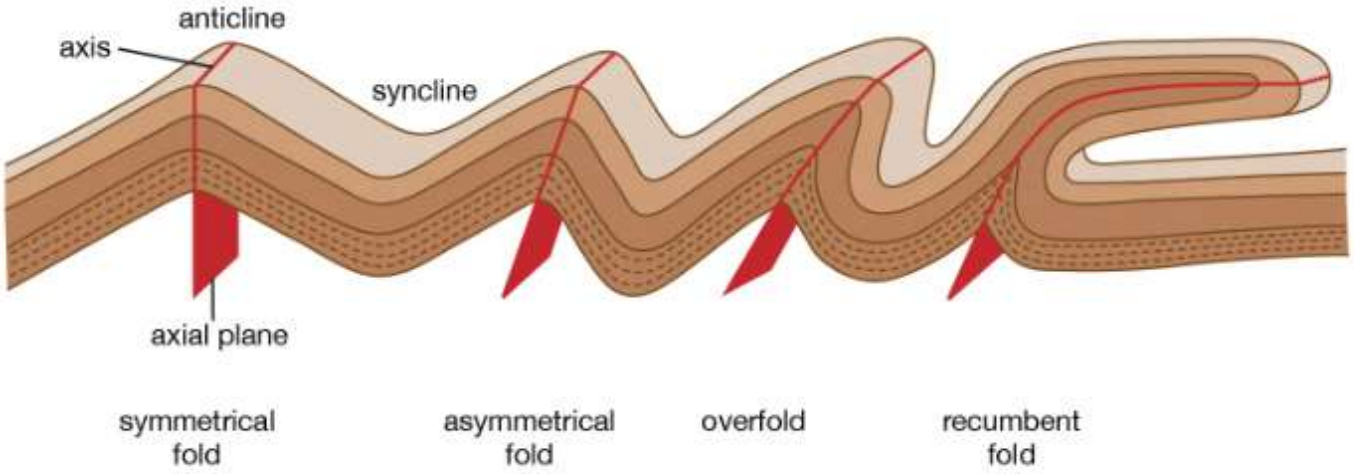
- Mountains are considered to be weak physical features because they are much more vulnerable to erosion as compared to plateaus.

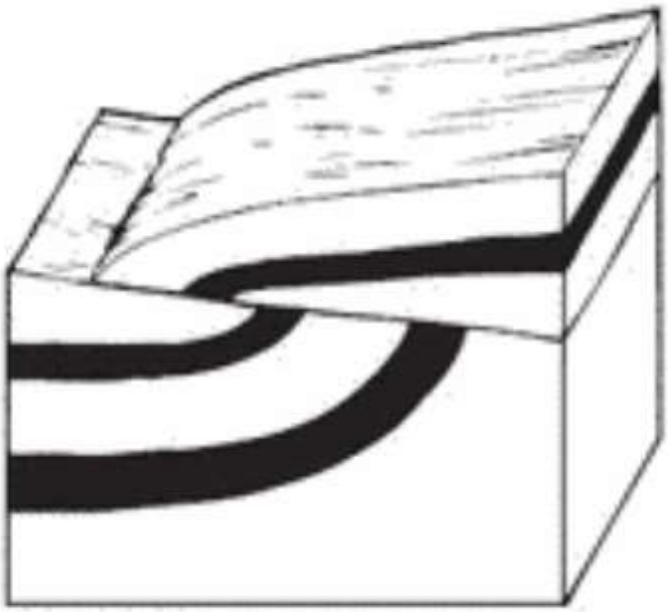
Types of Folds:

- The sides of a fold are called **limbs.**
- Upfolds are called **anticlines** which are formed when the strata(collection of rock layers) are bent upwards.
- Downfolds are called **synclines** which are formed when the strata are bent downwards.
- 

- If both limbs are inclined at the same angle, we get a **symmetrical fold.**
- If one of the limbs is inclined at an angle more than the other, it is called **asymmetrical fold.**
- When the strata in one limb are folded beyond the vertical axis, we get an **overfold.**
- A fold that is literally lying down due to the continuation of the pressure of one of the limbs is called a **recumbent fold.**

- 

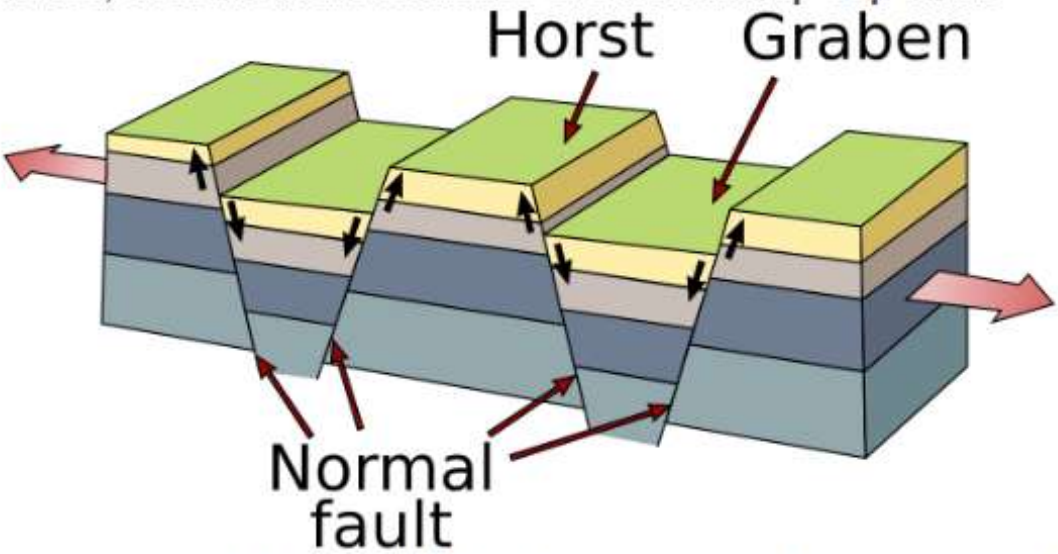
- If the pressure exerted upon the recumbent fold is sufficiently great to cause it to be torn from its roots and thrust forward, we get a **nappe.**

- 

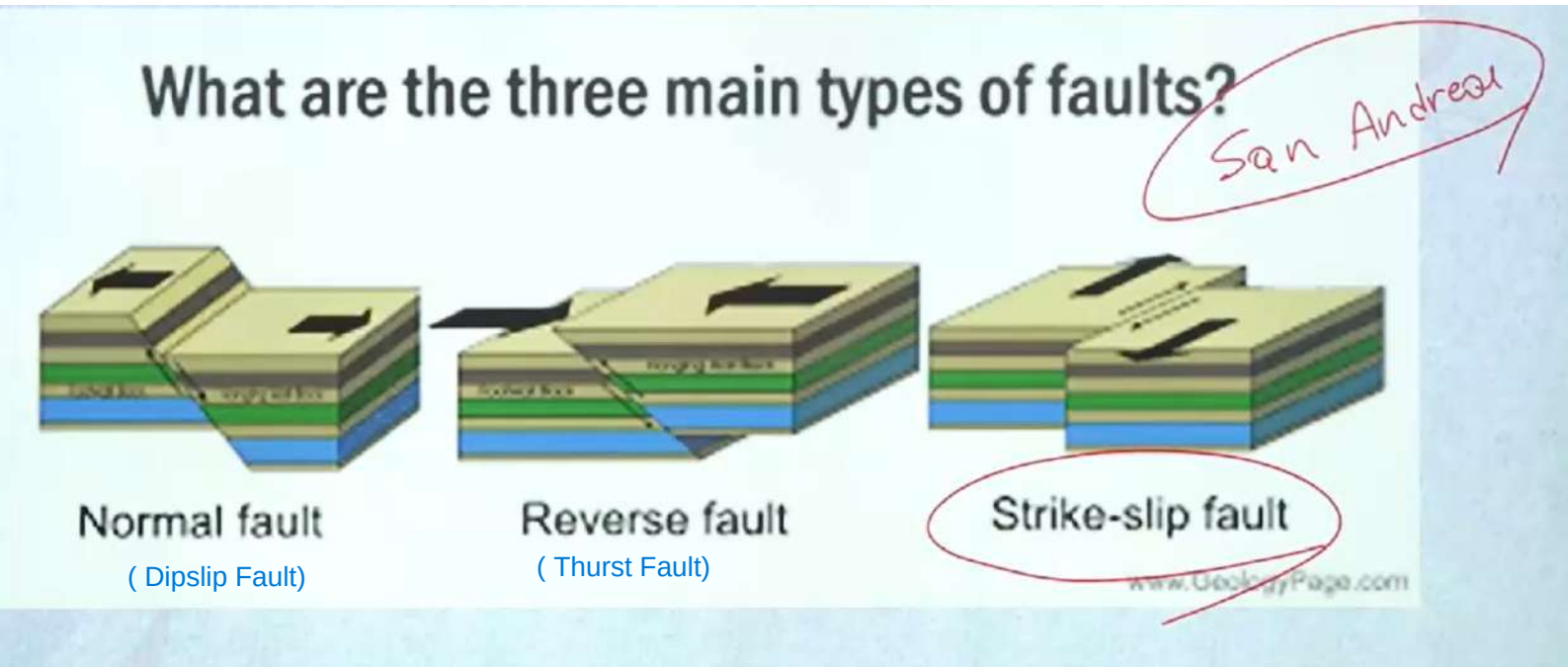
nappe

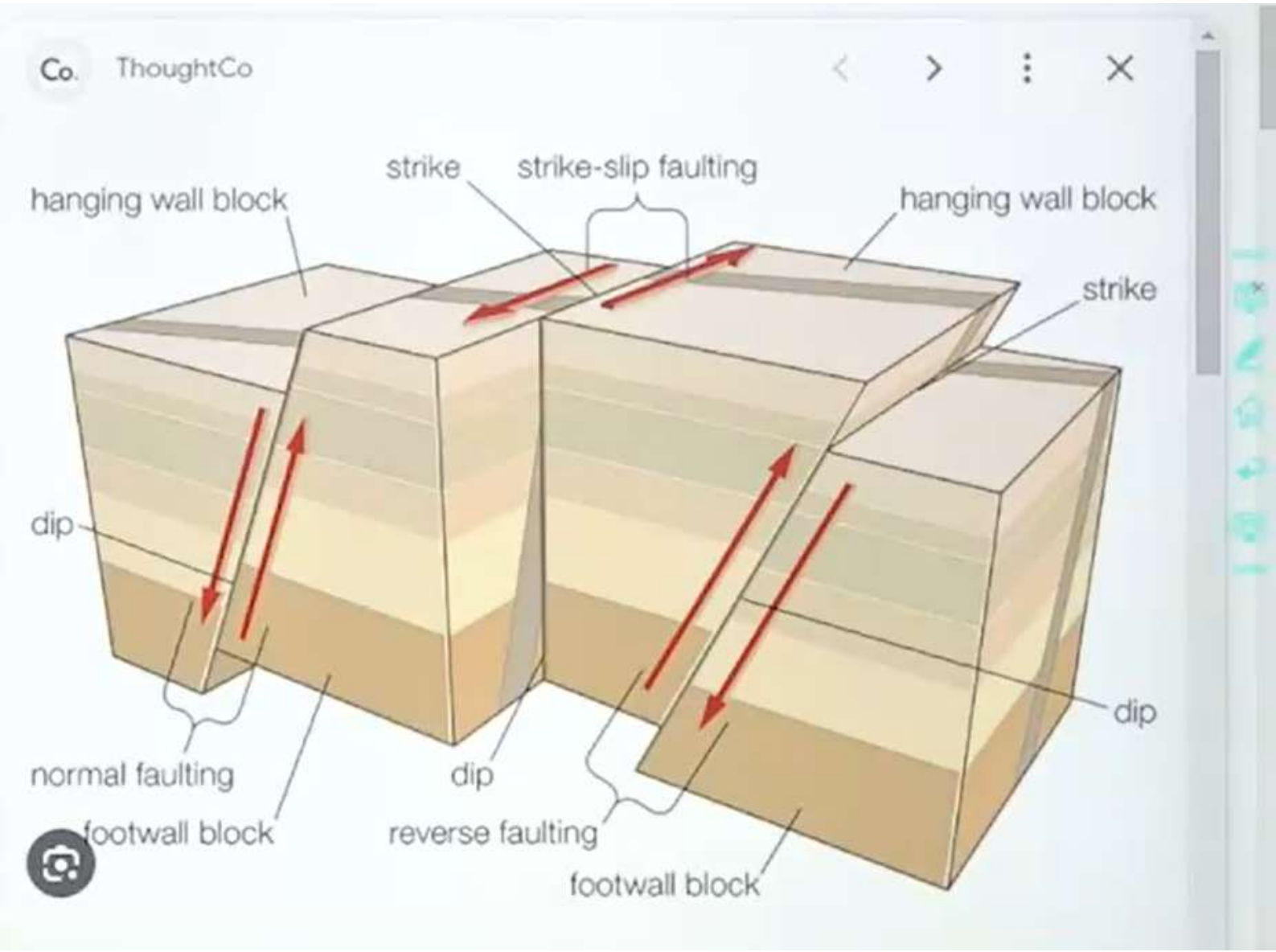
- They are well developed in the Himalayas and Alps where two continents collide.
- In such a condition, large forces are involved.

TYPES OF FAULTS(11:30 AM):

- The upstanding/upthrust block is called **Horst.**
- The down-dropped/subsided block is the **Graben**.
- When one of the blocks moves downwards relative to another one due to tensional forces, it results in the formation of a **normal/dip-slip fault.**
- 

- The normal fault generally has the tendency to create a gap in between which is called **Rift Valley**
- When one block moves up in relation to another one, it results in a **Reverse or Thrust fault.**
- It is caused due to compressional force.
- When both the blocks move across each other with no vertical movement, it is called a **Strike-Slip fault** or **Transform fault.**
- Such regions are sites of major earthquakes.
- **For example-** the San Andreas fault.


What are the three main types of faults?
San Andreas
Normal fault
(Dipslip Fault)
Reverse fault
(Thurst Fault)
Strike-slip fault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strike
strike-slip faulting
hanging wall block
hanging wall block
strike
dip
dip
normal faulting
dip
footwall block
reverse faulting
footwall block