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Earth movements: Endogenic & Exogenic Forces

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Geomorphic processes are the processes that cause changes in the land area or crust of the earth. Exogenic and endogenic processes are the two types of processes. Exogenic forces or external forces are forces that take their power from the earth's surface or originate within the earth's atmosphere.The term "endogenic forces," sometimes known as "internal forces," refers to the pressure that comes from within the ground.

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Exo- Outside
Genic- Origin

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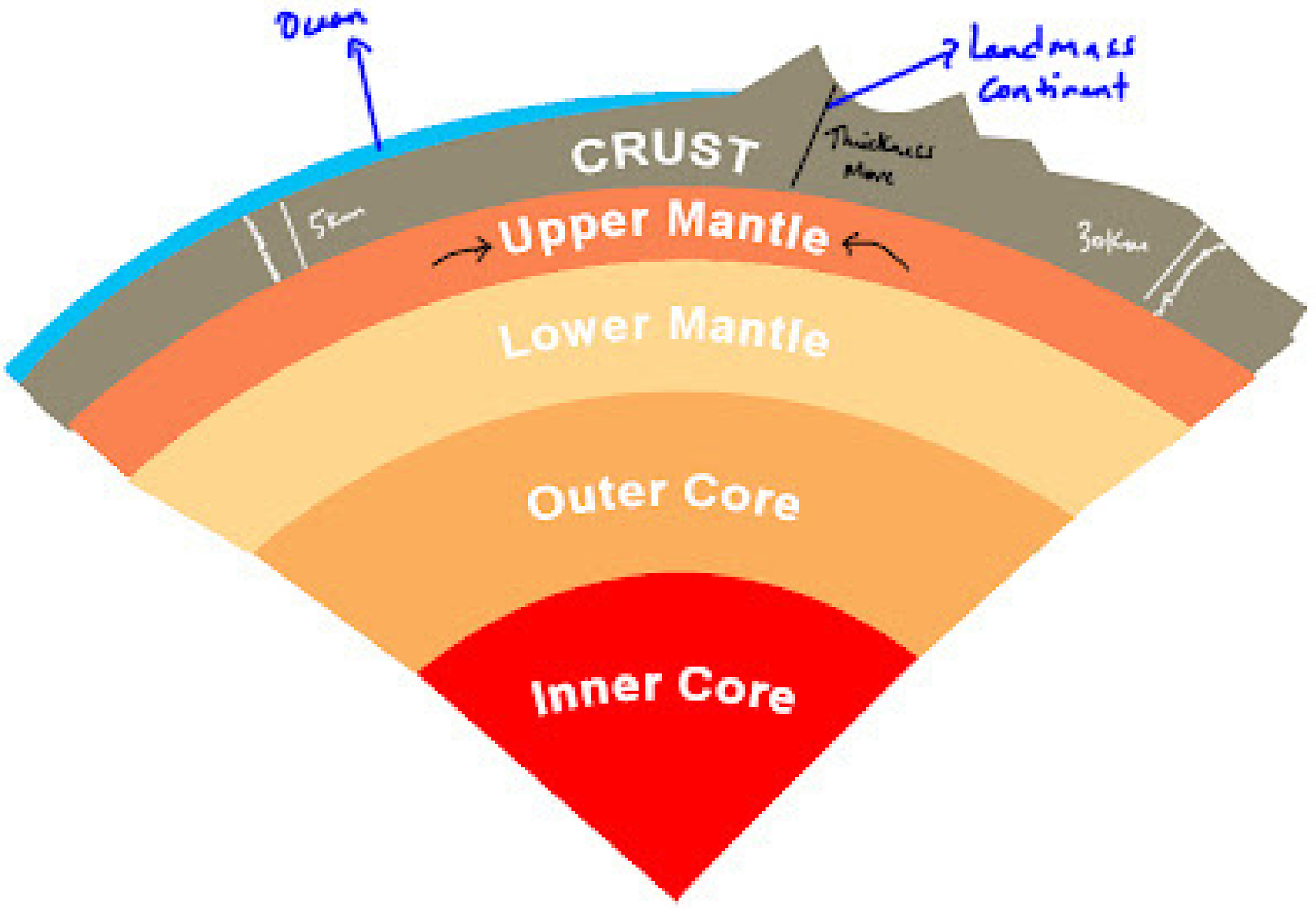
Exogenic Forces:

Exogenic forces are natural processes that occur on or near the Earth's surface, driven by external agents like wind, water, and ice, primarily influenced by gravity and solar energy. These forces play a crucial role in shaping the Earth's landscape through various geological activities, including weathering, erosion, transportation, and deposition.


Ocean
Landmass
Continent
CRUST
Upper Mantle
Lower Mantle
Outer Core
Inner Core

1. Weathering

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Weathering is the breakdown of rocks and minerals at the Earth's surface through physical, chemical, and biological processes.

- Physical Weathering: Also known as mechanical weathering, it involves the physical breakdown of rocks without any change in their chemical composition. Examples include freeze-thaw cycles, thermal expansion, and abrasion.
- Chemical Weathering: This involves the chemical alteration of minerals within the rock, leading to its disintegration. Common processes include hydrolysis, oxidation, and carbonation.
- Biological Weathering: Living organisms contribute to weathering. Plant roots can grow into cracks in rocks and break them apart, while organisms like lichens produce acids that chemically weather rocks.

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2. Erosion

Erosion is the process by which weathered rock and soil are moved from one location to another by natural forces such as water, wind, and ice.

- Water Erosion: Running water from rivers and streams is a powerful agent of erosion, carving valleys and transporting sediments downstream. Rainfall can also cause erosion through surface runoff.
- Wind Erosion: In arid and semi-arid regions, wind can transport fine particles over large distances, leading to the formation of features like sand dunes.
- Glacial Erosion: Glaciers erode the land by plucking and abrasion as they move, carving out U-shaped valleys and transporting large amounts of debris.

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3. Transportation

Transportation involves the movement of eroded materials from their original location to new sites. The agents of transportation include:

- Rivers and Streams: Transport sediments from higher to lower elevations.
- Wind: Carries fine particles across vast distances.
- Glaciers: Move debris along with ice flow.
- Ocean Currents: Distribute sediments along coastlines and across ocean basins.

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4. Deposition

Deposition occurs when the agents of erosion lose energy and drop the sediments they were carrying.

- River Deposition: Sediments are deposited in river beds, floodplains, and deltas.
- Wind Deposition: Leads to the formation of loess plains and sand dunes.
- Glacial Deposition: Deposits moraines and drumlins.
- Marine Deposition: Forms beaches, spits, and barrier islands.

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5. Mass Wasting

Mass wasting refers to the downslope movement of soil and rock under the influence of gravity. It includes landslides, rockfalls, and mudflows.

Importance of Exogenic Forces

Exogenic forces are vital for the continuous reshaping of the Earth's surface, contributing to the rock cycle and creating diverse landforms. They influence soil formation, sedimentary rock creation, and landscape development, playing a critical role in maintaining ecological balance and supporting various life forms.

Understanding exogenic forces helps geologists and environmental scientists predict geological hazards, manage natural resources, and plan sustainable development strategies.