

Unit 3

Physical Oceanography

UEQ: What geological processes are responsible for the physical features of the Earth.

Concept 1: Physical features of the Earth

- Lesson Essential Questions:
 1. What is the Big Bang Theory?
 2. What are the layers of the Earth?
 3. What geological activities are involved in seismic activity?

LEQ 1: What is the Big Bang Theory?

- The Big Bang Theory is the scientific theory of how the universe formed.
 - The universe is expanding, continually getting larger in all directions.
 - 13.7 billion years ago all the matter in the universe was compacted into a small dense space (the size of the head of a pin) and an explosion (the Big Bang) caused all of that matter to spread outward from that point eventually creating stars and planets and the universe we know today.
 - [The Big Bang Theory](#)

LEQ 2: What are the layers of Earth?

- Earth is divided into layers moving from Earth's center to the outermost border with space.
 - These layers are divided by what they are made out of and what characteristics they have.
 - For example are they solid, liquid, or gas?

LEQ 2: What are the layers of Earth?

- Inner Core
 - The very center of Earth.
 - Solid and dense because of the pressure from the upper layers.
 - Made of iron with small amounts of nickel, oxygen, silicon, and sulfur.

LEQ 2: What are the layers of Earth?

- Outer Core
 - Surrounds the inner core.
 - Liquid due to the intense heat from the surrounding layers.
 - Also made of mostly iron.

LEQ 2: What are the layers of Earth?

- Mantle
 - Surrounds the outer core.
 - The largest layer inside of Earth.
 - Made of silicon, oxygen, magnesium, and iron.
 - Most of the mantle is solid, however the top most portion of the mantle is considered a fluid solid because it can flow.

LEQ 2: What are the layers of Earth?

- Crust

- The crust is the outermost portion of solid Earth and it surrounds the mantle.
- The thickness of the crust varies depending on where it is located.
 - Thickest in mountain ranges and thinnest under the ocean.
- The crust is made of silicon, aluminum, magnesium, and iron.
- The crust is solid and less dense than the mantle.

LEQ 2: What are the layers of Earth?

- Atmosphere
 - The outermost layer of Earth.
 - A thin layer of gas around the planet.
 - Protects the planet from extreme temperature changes like a blanket.
 - Protects life on Earth from some of the Sun's harmful UV rays.
 - Made of Nitrogen, carbon, oxygen, and other gases.

LEQ 3: What geologic activities are involved in seismic activity?

- Geologic activity: any activity that involves the solid portion of Earth.
 - Include earthquakes, volcanoes, erosion, and weathering.
- Seismic activity is any motion of the plates that make up Earth's crust and cause seismic waves.
 - Waves of energy that travel through solid Earth.

LEQ 3: What geologic activities are involved in seismic activity?

- Earthquakes are caused when Earth's crust moves along breaks called faults.
 - Energy is released when the rocks break and travels through Earth from the point of the break outward (seismic waves).

LEQ 3: What geologic activities are involved in seismic activity?

- Volcanoes are formed when liquid rock from under the crust (magma) pushes up through the crust and erupts onto Earth's surface.
 - This eruption causes an earthquake as it breaks the crust and therefore seismic activity.