

Quarter 1 Divider: Land Beneath Our Feet

Standards: 6.E.2 Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and understand the effects of the lithosphere on humans.

6.E.2.1 Summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density.

6.E.2.2 Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth.

6.E.2.3 Explain how the formation of soil is related to the parent rock type and the environment in which it develops.

6.E.2.4 Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship.

Essential Questions:

- * Why are the Earth's layers in the order that they are?
- * How does the inside of Earth affect the outer layer of Earth (crust)?
- * What is the relationship between rocks, soil, and the environment?
- * What can humans do to preserve and protect our soil and lithosphere?

Understandings-Students will understand:

- the Earth is composed of layers that are stacked on top of one another because they are made of different materials with different densities.
- forces within the Earth form and move crustal plates and ocean basins.
- crustal plates interact with one another due to forces within the Earth.
- there is a process of soil formation which is dependent on parent rock type and environmental factors.
- the health of humans requires monitoring the lithosphere, soil quality and being stewards of the Earth.

Knowledge-Students will know:

- ~ the layers of the Earth
- ~ why the layers are separated how they are
- ~ the difference between conduction currents and other ways heat flows
- ~ how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow, and volcanoes to reflect forces within the earth
- ~ the rock cycle
- ~ which type of rock creates different soil types
- ~ different environmental factors that create soil from parent rock
- ~ technologies available to monitor the lithosphere and soil
- ~ connections between technologies and human health
- ~ key vocabulary associated with the lithosphere

Skills-Students will be able to:

- Compare and contrast the layers of the earth based on density, composition, and position.
- Describe how the interactions between plate movements can cause a variety of lithospheric actions including the formation of ocean basins, the creation of mountains and volcanoes, and the occurrence of earthquakes.
- Explain how convection currents are responsible for the lithospheric actions.

Skills Continued-Students will be able to:

- Understand the rock cycle and how continuous environmental actions of the lithosphere can change rocks over time.
- Explain how soil is formed from parent rock and that weathering over time creates different soil layers.
- Compare and contrast soil formation in different types of environments.
- Conclude that human actions can impact the lithosphere and soil formation and understand the conservation methods of maintaining good soil quality and stewardship.

Essential Vocabulary:

Earthquakes - a sudden and violent shaking of the ground as a result of movements within the earth's crust or volcanic action.

Rock Cycle - cycle of processes undergone by rocks in the earth's crust, involving igneous intrusion, uplift, erosion, transportation, deposition as sedimentary rock, metamorphism, remelting, and further igneous intrusion

Soil - the upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles

Plate Tectonics - a theory explaining the structure of the earth's crust and many associated phenomena as resulting from the interaction of rigid lithospheric plates that move slowly over the underlying mantle

Rock Groups - rocks can be categorized into 3 groups based on how they were formed (igneous, metamorphic, sedimentary)

Soil Stewardship - taking care of the land

Layers of the Earth - layers of the earth are defined by their composition and density which impacts their position in the earth (crust, mantle, outer core, inner core)

Volcano - a mountain or hill that has a crater or vent through which lava, rock fragments, hot vapor, and gas are being or have been erupted from the earth's crust

Convection Currents - the movement caused within a fluid by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat

Geology - the study of Earth's physical structure and substance

Asthenosphere - a layer of the earth that includes the upper part of the mantle (below the lithosphere) which has the ability to flow due to convection currents and is responsible for plate movement.

Lithosphere - a layer of the earth that includes the crust and the upper mantle

Tectonic Plates - large pieces of the lithosphere

Subduction Zone - an area where one plate sinks beneath another plate due to density

Seismic Waves - energy that is produced by the vibrations of the earth's crust (primary waves, secondary waves, surface waves)

Continental Drift - a theory that all the continents were once joined together as the supercontinent, Pangaea.

Ring of Fire - the area surrounding the Pacific Plate that has a large amount of volcanoes and earthquakes

Convergent Boundary - where tectonic plates move towards each other

Divergent Boundary - where plates move away from each other

Transform Boundary - where plates slide past each other

Magma - molten rock found inside the earth

Lava - molten rock that reaches the earth's surface

Extrusive - igneous rocks that were formed from lava cooling and hardening

Intrusive - igneous rocks that were formed from magma cooling and hardening

Mechanical Weathering - the process of breaking down rock by physical means (ex. Ice wedging)

Chemical Weathering - the process of breaking down rock through chemical reactions (ex. oxidation)

Horizon - a layer of soil in a deep soil sample

Decomposers - organisms that breaks down wastes and dead organisms

Weathering - the chemical and physical processes that break down rock at Earth's surface

Erosion - the process that moves soil and weathered rock by water, ice, wind or gravity

Deposition - the process of sediment settling out of the water, wind, or whatever is carrying it

Compaction - the process of sediments pressing together under their own weight

Cementation - the process of how dissolved minerals form crystals and glue particles of sediment together

Fungi - more than 1 fungus; a fungus; a type of decomposer that includes: molds, yeast, mushrooms and toadstools

Core-the layer of the Earth that is below the mantle (talking about the Inner Core and Outer Core Combined

Crust-outermost layer of the Earth and is solid

Mantle-solid layer of the Earth that is under the crust

Outer Core- liquid layer of the Earth that is below the mantle

Inner Core-solid layer of the Earth that is below the outer core and is the deepest layer

Continental Crust- the part of Earth's crust that is land; it makes up the continents

Oceanic Crust-the part of Earth's crust that makes up the ocean floor; it is under the oceans

Mass- the amount of matter in an object and is measured on a scale

Volume-the amount of space an object takes up and is measured by displacement or by LxWxH

Density-the amount of matter of an object in a specific amount of space and is calculated

Pangaea-the name given to the supercontinent that was believed to have existed millions of years ago

Meniscus-the lowest part of the liquid level when you are measuring volume with a graduated cylinder