UBD Unit Design Template

Time Frame: 1 ½ quarters	**Unit Title: What causes Earth's surface to change?**	**Course Name: 6th Grade Science**

Stage 1: Desired Results

Established Goal(s)

MS-ESS1-4:
Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

MS-ESS2-2:
Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

MS-ESS2-3:
Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

MS-ESS2-1:
Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Transferable Skills

Students will be able to independently use their learning to...

- Ask questions
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Use mathematics and computational thinking
- Construct explanations
- Engage in argument from evidence
- Obtain, evaluate, and communicate information

Meaning

Understandings
Students will understand that...

Some processes build Earth up.

Some processes wear down Earth's surface.

Earth's outer layer is constantly changing due to processes happening at and below Earth's surface.

Essential Questions
These are the investigation questions that guide student work throughout the unit.

What is causing Mt. Everest and other mountains to move, grow, or shrink?

How are earthquakes related to where mountains are located?

How does what we find on and below Earth's surface compare in different places?

What is happening to Earth's surface and the material below it during an earthquake?

How does plate movement affect the land around mountains such as Mt. Everest?

How could plate movement help us explain how Mt. Everest and other locations are changing in elevation?

What happens at mountains where we see volcanic activity?

What is occurring at locations where two plates are moving away from each other?

What causes mountains to change?

Where were Africa and South America in the past?

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		Where were the other plates located in the distant past? Where did mountains that aren't at plate boundaries today, like the Appalachians and Urals, come from? What causes mountains to shrink in elevation? How is there an exposed marine fossil on Mt. Everest? And, what other remaining questions from our Driving Question Board can we now answer?
	Acquisition	
	Students will know... MS-ESS1.C • Geologic time scale interpreted from rock strata provides a way to organize Earth's history • Analysis of rock strata and fossil record provide relative dates, not absolute dates • Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches MS-ESS2.A • Energy flows and matter cycles within Earth's systems • Energy comes from Earth's interior • Flowing energy and cycling matter produce physical and chemical changes in Earth's materials • energy from the sun is the main driver of erosional forces at and above surface of Earth • magma is moving due to energy from Earth's interior • Earth's systems interact over scales from microscopic to global in size • Earth's systems interact over fractions of a second to billions of years • formation and destruction of mountains takes millions of years MS-ESS2.B • maps based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart MS-ESS2.C • Water's movements on land and underground cause weathering and erosion, which change the land's surface	*Students will be able to...* • analyze layers to determine older material is below younger material • use mathematical reasoning to determine time period from which we should gather data • analyze rock strata and fossil data to determine location of past continents from specified time period • determine energy from sun is main driver behind erosional forces above Earth's surface • determine magma moves because of heat from Earth's interior • analyze plate interactions from large spatial and temporal scales and compare them to annual rates of plate movement and erosional • determine mountains get created and destroyed over millions of years Key skills students will acquire from the lesson, unit, or course. • developing and using models • using mathematical and computational thinking • constructing explanations • engaging in argument from evidence • obtaining, communicating, and evaluating information

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	features and create underground formations Vocabulary • correlation • causation • epicenter • earthquake depth • magnitude • sediment • bedrock • plate • crust • mantle • continental crust • oceanic crust • earthquake • constructive (volcano) • destructive (volcano) • magma • lava • weathering • erosion • deposition • erosion rate • uplift rate	