

<p>Important Concepts</p> <p>Forces That Shape the Earth</p> <p>6-8 Level</p>	<p>Alaska Science Content Standard <b>D2</b> Students develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth.</p>
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Grade Level Expectations:

The student demonstrates an understanding of the forces that shape Earth by:

[6] **SD2.1** describing the formation and composition (i.e., sand, silt, clay, organics) of soils

[6] **SD2.2** identifying and describing its layers (i.e., crust, mantle, core)

[6] **SD2.3** describing how the surface can change rapidly as a result of geological activities (i.e., earthquakes, tsunamis, volcanoes, floods, landslides, avalanches)

[7] **SD2.1** identifying strategies (e.g., reforestation, dikes, wind breaks, off road activity guidelines) for minimizing erosion

[7] **SD2.2** describing how the movement of the tectonic plates results in both slow changes (e.g., formation of mountains, ocean floors, and basins) and short-term events (e.g., volcanic eruptions, seismic waves, and earthquakes) on the surface

[8] **SD2.1** interpreting topographical maps to identify features (i.e., rivers, lakes, mountains, valleys, islands, and tundra)

[8] **SD2.2** using models to show the relationship between convection currents within the mantle and the large-scale movement of the surface (L)

According to AAAS's Benchmarks for Science Literacy\*, some of the things that students should know and understand by the end of eighth grade are:

The interior of the earth is hot. Heat flow and movement of material within the earth cause earthquakes and volcanic eruptions and create mountains and ocean basins. Gas and dust from large volcanoes can change the atmosphere.

Some changes in the earth's surface are abrupt (such as earthquakes and volcanic eruptions) while other changes happen very slowly (such as uplift and wearing down of mountains).

The earth's surface is shaped in part by the motion of water (including ice) and wind over very long times, which acts to level mountain ranges. Rivers and glacial ice carry off soil and break down rock, eventually depositing the material in sediments or carrying it in solution to the sea. Thousands of layers of sedimentary rock confirm the long history of the changing surface of the earth and the changing life forms whose remains are found in successive layers. The youngest layers are not always found on top, because of folding, breaking, and uplift of layers.

Human activities, such as reducing the amount of forest cover, increasing the amount and variety of chemicals released into the atmosphere, and intensive farming, have changed the earth's land, oceans, and atmosphere. Some of these changes have decreased the capacity of the environment to support some life forms.

There are a variety of different landforms on the earth's surface (such as coastlines, rivers, mountains, deltas, and canyons).

\*Project 2061, American Association for the Advancement of Science, Benchmarks for Science Literacy. New York: Oxford University Press, 1993.

Matching coastlines and similarities in rock types and life forms suggest that today's continents are separated parts of what was long ago a single continent.

The earth first formed in a molten state and then the surface cooled into solid rock.

The outer layer of the earth—including both the continents and the ocean basins—consists of separate plates.

The earth's plates sit on a dense, hot, somewhat melted layer of the earth. The plates move very slowly, pressing against one another in some places and pulling apart in other places, sometimes scraping alongside each other as they do. Mountains form as two continental plates, or an ocean plate and a continental plate, press together.

There are worldwide patterns to major geological events (such as earthquakes, volcanic eruptions, and mountain building) that coincide with plate boundaries.