

<p>Important Concepts</p> <p>Water Cycle, Rock Cycle, Weather</p> <p>6-8 Level</p>	<p>Alaska Science Content Standard D1: Students develop an understanding of Earth's geochemical cycles.</p> <p>Alaska Science Content Standard D3: Students develop an understanding of the cyclical changes controlled by energy from the sun and by Earth's position and motion in our solar system. (Partially addressed)</p>
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Grade Level Expectations:

The student demonstrates an understanding of geochemical cycles by:

[6] SD1.1 exploring the rock cycle and its relationship to igneous, metamorphic, and sedimentary rocks (L)

[6] SD1.2 identifying the physical properties of water within the stages of the water cycle

[7] SD1.1 describing the rock cycle and its relationship to igneous, metamorphic, and sedimentary rocks

[7] SD1.2 explaining the water cycle's connection to changes in the Earth's surface

[8] SD1.1 making connections between components of the locally observable geologic environment and the rock cycle (L)

[8] SD1.2 applying knowledge of the water cycle to explain changes in the Earth's surface

The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by

[6] SD3.1 connecting the water cycle to weather phenomena

[6] SD3.2 identifying that energy transfer is affected by surface conditions (e.g., snow cover, asphalt, vegetation) and that this affects weather

[7] SD3.1 describing the weather using accepted meteorological terms (e.g., pressure systems, fronts, precipitation)

[8] SD3.2 recognizing types of energy transfer (convection, conduction, and radiation) and how they affect weather

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

The Earth is mostly rock.

A relatively thin layer of water, some of which is frozen, covers three-fourths of the Earth's surface.

A relatively thin layer of air surrounds the entire planet.

Water evaporates from the surface of the earth, rises and cools, condenses into rain or snow, and falls again to the surface.

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

The water falling on land collects in rivers and lakes, soil, and porous layers of rock, and much of it flows back into the oceans. The cycling of water in and out of the atmosphere is a significant aspect of the weather patterns on Earth.

Thermal energy carried by ocean currents has a strong influence on climates around the world. Areas near oceans tend to have more moderate temperatures than if they were farther inland but at the same latitude because water in the oceans can hold a large amount of thermal energy.

The earth has a variety of climates, defined by average temperature, precipitation, humidity, air pressure, and wind, over time in a particular place.

The atmosphere is a mixture of nitrogen, oxygen, and trace amounts of water vapor, carbon dioxide, and other gases.

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.

Sediments of sand and smaller particles (sometimes containing the remains of organisms) are gradually buried and are cemented together by dissolved minerals to form solid rock again.

Sedimentary rock buried deep enough may be re-formed by pressure and heat, perhaps melting and re-crystallizing into different kinds of rock. These re-formed rock layers may be forced up again to become land surface and even mountains. Subsequently, this new rock too will erode.

Rock bears evidence of the minerals, temperatures, and forces that created it.

Although weathered rock is the basic component of soil, the composition and texture of soil and its fertility and resistance to erosion are greatly influenced by plant roots and debris, bacteria, fungi, worms, insects, rodents, and other organisms.