

Principle 2: The ocean and life in the ocean shape the features of the Earth.

All matter on Earth cycles through various reservoirs: the atmosphere, hydrosphere, biosphere and lithosphere.

Rock Cycle and Plate Tectonics

A.
All the rocks around us will end up in the ocean due to weathering and erosion. The continual formation and breakdown of rocks constitutes the rock cycle.

A.1.
Rocks are constantly being broken down and recycled through weathering, erosion and processes associated with plate tectonics, such as subduction and uplift.

A.7.
Rocks are constantly being formed through accretion, sedimentation, volcanism and igneous processes.

A.2.
Many products of weathering and erosion enter the ocean via rivers and atmospheric deposition. All matter remains in the ocean for different lengths of time (residence times).

A.3.
Oceanic plates are more dense than continental plates and are subducted beneath continental plates when the two collide, causing the continental plates to be lifted.

A.8.
Accretion is the process by which material is added to a tectonic plate through subduction and uplift, sea level change and wave action.

A.9.
Sedimentation in the ocean can occur by the process of material settling out of the water by gravity so it accumulates on the sea floor, or by the process of currents or waves moving material along the seafloor.

A.10.
Volcanism at plate boundaries and within plates, as well as uplift and exposure of igneous and sedimentary rocks, creates new rock formations.

A.4.
Subduction can result in the addition of oceanic rocks and sediments to the upper mantle or to the edge of the continent.

A.5.
Ocean trenches, island arcs, and some mountain ranges (e.g., Andean) are examples of geologic features associated with subduction.

A.16.
Some parts of the ocean, (e.g., the Pacific Rim) are dominated by subducted plate boundaries.