**Principle 1: Earth has one big ocean with many features.**

- **Geologic Features**
  - A. Motion along the margins of lithospheric plates creates physical features on the ocean floor and land.
  - A.1. Molten along the margins of lithospheric plates are the result of the constant motion of the lithospheric plates that make up Earth’s crust.
  - A.2. Plate movement is primarily caused by the convection of hot fluids below Earth’s crust.
  - A.3. New lithospheric crust is generated at spreading centers while older, denser crust is recycled into the Earth’s interior at subduction zones, creating various physical features.
  - A.4. The continents are still in motion today.
  - A.5. Features on the ocean floor are highly varied, and include trenches, rift valleys, mid-ocean ridges, seamounts, islands, and continental shelves.

- **Properties of Ocean Water**
  - B. The size and shape of the ocean has changed over geologic time and continues to move and change.
  - B.1. During various times in Earth’s geologic history, all of the continents have been joined into one “super continent.” A giant ocean circulated around the supercontinent.
  - B.2. The supercontinent breaks apart along rift valleys to create new, smaller continents and ocean basins known as the Pacific Ocean, Atlantic Ocean, etc.
  - B.3. Many of the physical features on the ocean floor are the result of the constant motion of the lithospheric plates that make up Earth’s crust.
  - B.4. The density of ocean water increases as salinity (amount of dissolved solids) increases and as temperature decreases.

- **Ocean Circulation**
  - C. The ocean is one interconnected body of water that is integral to the water cycle and is in constant motion in a global circulation system.
  - C.1. A global ocean circulation system is generated from tides and different types of currents moving the water.
  - C.2. Tides are mainly caused by the gravitational interaction between Earth, the moon, and the sun.
  - C.3. The wind, combined with Earth’s rotation (Coriolis effect), drives surface currents in circular gyres in each ocean basin, clockwise in the Northern Hemisphere and counter-clockwise in the Southern Hemisphere.
  - C.4. Currents are especially important in moving young organisms (larvae and juveniles) where photosynthetic primary producers grow.
  - C.5. Ocean circulation is influenced by the position of landmasses, continents, and other geologic features.
  - C.6. Ocean circulation influences the position of landmasses, continents, and other geologic features.