

Ecology 2; Cycles in Nature

7th Gr. Life Science

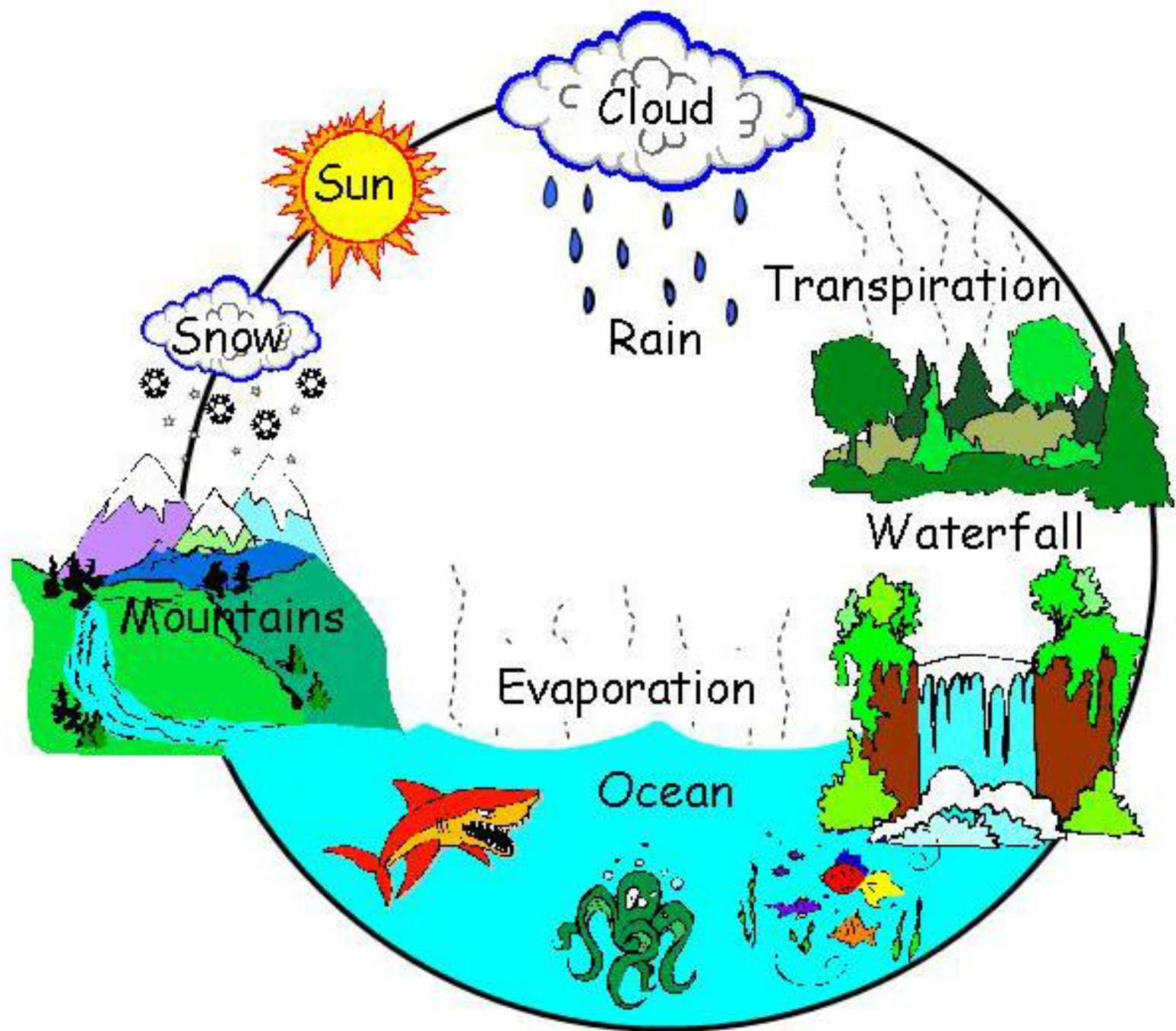


Earth Cycles

- Earth's biosphere contains a fixed amount of **water, carbon, nitrogen, oxygen**, and other materials that cycle through the environment and are **reused** by different organisms.
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Water Cycle

- How water moves from the Earth's surface to the atmosphere and back to the surface again
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Components of the Water Cycle

- Evaporation: when liquid water changes into water vapor and enters the atmosphere
- Condensation: the process of changing water from a gas to a liquid
- Precipitation: when water drops become large enough and fall to the ground as rain, snow, sleet, etc.
- Transpiration: Transpiration is the process by which plants lose water out of their leaves. Transpiration gives evaporation a bit of a hand in getting the water vapor back up into the air.

Nitrogen cycle

- The transfer of nitrogen from the atmosphere to the soil, to living organisms, and back to the atmosphere
- The growth of all organisms depends on the availability of mineral nutrients, and none is more important than nitrogen.
- It is required in large amounts as an important part of proteins, nucleic acids and other cellular parts.

Nitrogen Cycle (cont.)

- There is an abundant supply of nitrogen in the earth's atmosphere - nearly 79% in the form of N₂ gas. However, N₂ is unavailable for use by most organisms because there is a triple bond between the two nitrogen atoms, making the molecule very unreactive.



Nitrogen Fixation

- In order for nitrogen to be used for growth it must be "fixed" (combined) in the form of ammonium (NH_3) or nitrate (NO_3) ions.
- Some bacteria can convert N_2 into ammonia by the process termed **nitrogen fixation**; these bacteria are either free-living or form symbiotic associations with plants or other organisms (e.g. termites, soybeans)
- Nitrogen-fixing bacteria can be found in the soil as well as on submerged objects in lakes and ponds. These are called blue-green algae.

Legume symbioses

- The most familiar examples of nitrogen-fixing symbioses are the **root nodules of legumes** (peas, beans, clover, etc.).



Carbon Cycle

- How carbon molecules move between the living and nonliving world
- The same carbon atoms in your body today have been used in countless other molecules since time began.
- Plants absorb carbon dioxide from the atmosphere and use it, combined with water they get from the soil, to make the substances they need for growth.

Carbon Cycle (cont.)

- Animals, like rabbits, eat the plants and use the carbon to build their own tissues.
 - Other animals, such as the fox, eat the rabbit and then use the carbon for their own needs.
 - These animals return carbon dioxide into the air when they breathe, and when they die, since the carbon is returned to the soil during decomposition.
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Carbon cycle (cont.)

- The carbon atoms in soil may then be used in a new plant or small microorganisms.
- Ultimately, the same carbon atom can move through many organisms and even end in the same place where it began.

