

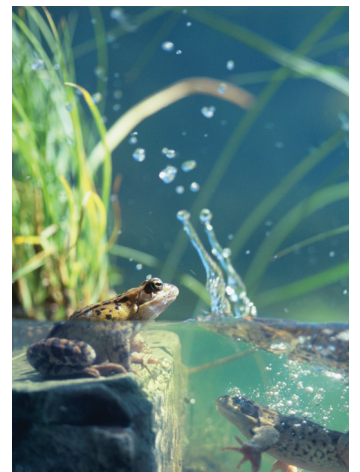
Ponds and lakes are places of wonder. Perhaps you have searched for frogs and turtles in the mud or looked for salamanders under rocks. The murky bank of a neighborhood pond is a great place to begin a lifelong discovery of God's creation.

Ponds and lakes contain standing or slowly moving water and are surrounded by land. Generally, ponds are smaller and shallower than lakes. However, this is not always true. Echo Lake in New Hampshire has a water surface area of about 5.6 hectares and is 3.35 meters deep. In contrast, the water in Island Pond in Vermont covers an area of 202.3 hectares and is 18.29 meters deep. Lakes and ponds can be found in a variety of sizes and depths.

Ponds and lakes are unique habitats, separate from the surrounding meadows or forests. Their ecosystems consist of freshwater organisms that depend on each other and the environment to survive. Algae, flagellates, plants, invertebrates, fungi, and fish are examples of the producers, consumers, and decomposers in these ecosystems. These organisms reside in one of the following four habitats: the shore, surface film, open water, or bottom water. The most plants and animals are found in the shallow depths of ponds and lakes where sunlight can penetrate.

OBJECTIVES

- Compare features of ponds and lakes.
- Determine how sunlight infiltration affects pond and lake ecosystems.
- Explain how ponds and lakes form.



The temperatures of lakes and ponds are affected by the depth of sunlight infiltration. If a pond is very shallow, the sun's rays can reach to the bottom, enabling rooted plant growth throughout the pond. Without sunlight, rooted plant growth does not occur on the floors of ponds or lakes. Plant growth is further inhibited on lake shorelines that experience excessive wind and wave erosion.

Pond temperatures are relatively uniform throughout, but deep ponds or lakes can contain multiple thermal layers during the summer months in temperate regions. This layering, called *thermal stratification*, happens because the water's density changes with the temperature. Warm water is less dense than cold water. Spring winds help circulate lake water. As summer's heat warms a lake from the surface down, three layers of water form. The temperature of each water layer decreases moving downward. Wind circulates the less dense surface water, but the deeper water is relatively unmixed. Since water circulation moves oxygen through the water, the lake bottom has less oxygen in summer. Algae grows, preventing sunlight from reaching the lower layers in deep bodies of water. As temperatures cool in fall, the pond or lake water begins circulating again.

Thermal Stratification

