

What's in the box? (Modified from "The Life Box" pgs 76-8 of the Project WET Curriculum and Activity Guide, 1995)

Standards

K-2 Science Standards

Standard 3: Life Science

Benchmark 1: All students will develop an understanding of the characteristics of living things.

K-2 Geography Standards

Benchmark 3: Physical Systems: The learner understands Earth's physical systems and how physical processes shape the environment.

3-4 Science Standards

Standard 1: Science as an Inquiry

Benchmark 1: All students will develop the skills necessary to do full inquiry. Full inquiry involves asking a simple question, completing an investigation, answering the question, and sharing the results with others.

Purpose

The purpose of this activity is to understand that there are four factors necessary for life to exist.

Objectives

1. Students will identify, examine, and discuss the four factors necessary for life

Vocabulary

- Soil: the top layer of Earth's surface, containing unconsolidated rock and mineral particles mixed with organic matter
- Water: an odorless, tasteless, colorless liquid made up of a combination of hydrogen and oxygen
- Photosynthesis: the process through which green plants (and certain other organisms) produce simple sugars by combining carbon dioxide and water using light as an energy source and producing oxygen as a by-product

Activity

- Pass around a box containing soil (in a coffee filter) and water (in a bottle). Have each student open the box and write down what is inside or tell the class, and pass the box on to the next student. Ask students what they found in the box. When they respond soil and water, tell them there are two more things in the box. Have students brainstorm before telling them air and light are also in the box. Tell students that these four things are necessary for most life. Discuss importance of each object.

Soil

Soil is the result of rock that has been broken down by physical and/or chemical processes called weathering. Soil contains organic matter from decomposed plants and animals. Soil provides plants with minerals and nutrients, and it helps transport water to plants' roots.

Sunlight

Radiant energy from the sun illuminates and warms Earth's surface. Plants use the sun's energy to make sugar from carbon dioxide and water—a process called photosynthesis.

*Sunlight and soil are used directly by plants and indirectly by animals. Plants get minerals from the soil. Animals get their nutrients and energy from plants (or animals that eat plants).

Air

Air is a mixture of numerous gases that make up Earth's atmosphere, including nitrogen, oxygen, hydrogen, carbon dioxide, argon, neon, helium, and others. During plant photosynthesis, carbon dioxide is used to build sugar. Oxygen helps many plants and animals metabolize sugar in their cells. This burning of sugar, or respiration, supplies energy to living things.

Water

Water is the combination of two colorless and odorless gases—hydrogen and oxygen. It is needed to dissolve and carry nutrients in solution for transport of food and waste within organisms. The process of photosynthesis also requires water.

*Soil erosion and air or water pollution compromise the life-supporting properties of these resources. Through awareness of our dependence on clean water, soil, and air, perhaps through more direct use of sunlight for energy resources, we can learn to sustain the quality of our resources for future generations.

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