Grade : 4th
Strategy : Predicting
Technique : Story Mapping
Text Type : Science

Plants and the environment

Aims of the lesson:

- To help students develop prediction skills while reading about plants and their roles in the environment.
- To engage students with the narrative through critical thinking and personal connections to nature.
- To foster a deeper understanding of plant biology and ecology.

Text for the lesson:

What are plants?

Plants are living things. They do much more than just add beauty to our world. Plants give us the food we eat and some of the clothes we wear. They even give off a gas that we breathe, called oxygen. Without plants, Earth would be an empty place. With plants, our planet is bursting with life. Plants come in all sizes, shapes, and colours. Some are so small you can barely see them. Others can be as tall as skyscrapers. The giant California redwoods are the tallest living things on Earth. Some are 112 meters (367 feet) tall. That is taller than the Statue of Liberty! In all there are about 400,000 different kinds of plants. Each one is different. Yet most plants share some basic parts. Roots anchor the plant to the ground. They also take in water and nutrients from the soil. Stems hold the plant upright. They move water and nutrients throughout the plant. Leaves connect to the stem and collect light from the Sun.

Although plants differ in their shapes and sizes, all plants are alike in one way. They make their own food in a process called photosynthesis. All organisms, or living things, need energy to grow, stay healthy, and reproduce. Reproduce means to make more of one's own kind. Plants get the energy they need from the food they make. During photosynthesis, plants take in sunlight, water, and a gas in the air called carbon dioxide. Plants use these things to make sugar, which is a plant's source of food and energy. Getting Sunlight Plants have a material called chlorophyll that helps them take in sunlight. Chlorophyll is the material that gives plants their green colour. With the help of chlorophyll, plants take in energy from the Sun and use it to produce sugar. Energy from the Sun is called solar energy.

Plants need photosynthesis to survive and grow. Did you know that you need photosynthesis too? In fact, most animals depend on plants making their own food. Why? Animals cannot make their own food the way plants can. Instead they must eat other organisms to get the energy they need. Plants provide the energy that travels from one organism to another. Plants capture energy from the Sun to make their own food. They use most of their food energy as they grow and reproduce. They also store some energy in their roots, stems, leaves, and other structures. When an animal, such as a grasshopper, eats

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a plant, stored energy passes from the plant to the animal. The animal uses most of this energy to grow and reproduce. It also stores some energy. When an animal, such as a bird, eats the grasshopper, stored energy passes to the bird. In this way, most animals depend on plants for energy. In addition to providing animals with energy, plants also provide animals with the oxygen they need. Most animals cannot survive without oxygen for more than a few minutes. They need oxygen to carry out life processes. Most of the oxygen we breathe comes from plants and plant like living things that make their own food.

Plants can be found all over Earth. They live in a variety of environments from oceans to deserts. An environment is everything that surrounds a living thing. Plants live in any environment where they can get water, carbon dioxide, sunlight, and nutrients. Plants make up most of the biomass in an environment. Biomass is a measure of the number of living things in an environment. There are more plants in most environments than any other living thing. Plants are the main source of matter and energy in an environment. The animals in an environment use plants as a source of food and energy.

Process Phase 1: Planning (Teachers' perspective)
During this stage, the teacher prepares:

- The text "Plants and the Environment" for reading.
- Prediction activities and corresponding questions.
- Materials for journaling, drawing, and group discussions.

Cognitive Stage 1 (Students' perspective)
Step 1: Initial Predictions
Activity:

- Present the opening question: *What are plants?*
- Have students make predictions based on their existing knowledge. Ask them to choose one of the following:
    1. Plants have the same size, shape, and color.
    2. The roots of plants take in water and nutrients from the soil.
    3. Plants give off oxygen, which is essential for humans.
- Students can write their predictions in their journals and be prepared to discuss them after reading.

Cognitive Stage 2 (Students' perspective)
Step 2: Vocabulary Exploration
Activity:

- Provide students with a vocabulary list: bursting, barely, skyscrapers, anchor, chlorophyll.
- Have students discuss the meanings of these words and how they relate to the context of the text, allowing them to use the words in sentences.

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Process Phase 2: Engaging with the Text
Step 3: Predicting Based on Context
Activity:

- Read the first part of the text, explaining what plants do beyond adding beauty to the world.
- Pause after the introduction of photosynthesis and ask students to use what they have learned so far to predict how plants obtain energy. Provide the prediction options:
    1. Plants do not need energy to grow.
    2. The sun can produce energy.
    3. Plants get the energy they need from the food they make.
- Have students circle their chosen option, and discuss the reasoning behind their predictions.

Cognitive Stage 3 (Students' perspective)
Step 4: Continuing Predictions
Activity:

- As the story discusses the importance of photosynthesis, ask students to predict what happens if there were no plants on Earth. Ask them to select their predictions and share:
    1. Plants do not grow in some countries and deserts.
    2. Plants produce energy in environments where they grow.
    3. There are more plants in most environments than any other living thing.

Process Phase 4: Exploring the Impact of Plants
Step 5: Environmental Connection Reflection
Activity:

- Discuss how plants influence the environment and the importance of biodiversity.
- Ask students to reflect on how their local community depends on plants. Encourage predictions on what might happen to local ecosystems if plants were removed.
- Prompt them to write short reflections in their journals about how plants contribute to their lives and the larger environment.

Ways of Communication:

- **Interpretive** - Students interpret the significance of plant life and environmental sustainability, relating it to their own experiences.
- **Interpersonal** - Students engage in collaborative discussions and reflections with their peers throughout the lesson.
- **Presentational** - Students share their predictions, reflections, and ideas about ecosystems, enhancing their communication skills.

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