



Science Unit: *Forest Ecosystem*

Lesson 2: *Producers – Focus on Trees*

School year: 2006/2007
Developed for: Southlands Elementary School, Vancouver School District
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Grade level: Presented to grades 1 - 2; appropriate for grades 1-4 with age appropriate modifications.
Duration of lesson: 1 hour and 15 minutes
Notes: Seedlings will need to be obtained or grown beforehand.

Objectives

1. Examine tree seedlings and identify their main parts.
2. Using the seedlings as a focus, identify the essential needs of trees and other plants (water, nutrients light and oxygen).
3. Discuss the consequences that occur when these needs are not adequately met.

Background Information

Trees are the most obvious producers in the temperate rainforest. Temperate rainforests contain both conifers (narrow-leaf) and broad-leaf trees. Conifers have small, modified leaves known as needles and are generally evergreen, that is they retain their leaves year round. Conifers in B.C's temperate rainforest include Douglas fir, western red cedar, western hemlock and sitka spruce. Broad-leaf trees are usually deciduous, that is they tend to lose their leaves in the fall and regrow new leaves in the spring. Deciduous trees lose their leaves as a way of saving energy. In the winter the energy gained from the sun is not enough to balance the energy cost of maintaining leaves. Deciduous trees found in the temperate rainforest of B.C. include red alder, big leaf maple, vine maple and black cottonwood.

Vocabulary

Conifer: A tree that possesses narrow, modified leaves known as needles and produces seeds in cones.
Broad-leaf tree: A tree that possesses wide leaves.
Nutrients: Substances that organisms require in order to grow and survive.

Materials

- Conifer seedlings and cones
- Broad leaf seedlings and seeds (maple keys, acorns, etc.)
- Magnifying glasses, microscope(s) if available

In the Classroom

Introductory Discussion

1. What are producers (review).



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2. What are the main parts of a plant (leaves, stem/trunk, roots, students may also say seeds).
3. What are the major types of producers we find in the forest? (trees)
4. Short description of other items to discuss or review.
 - Discuss respect for living plants. Review how to use a magnifying glass.
5. Summary of instructions for science experiment/activity.
 - Give each student a tree seedling.
 - Have them point out the major anatomical structures (leaves/needles, stem, roots)
 - Ask them to draw each structure on their worksheet using 2-3 words to describe each part.
 - As part of the activity have them use the magnifying glass or microscope to examine the root structure. (set up microscope slide(s) for them).
 - When they are finished examining one type of plant they can switch seedling with their neighbor and examine the second type of plant.

Closure Discussion

1. Discuss the needs of plants (air, water, sunlight, and nutrients).
2. How do leaves, roots, and stems help plants meet these needs?

Leaves – use the sun's energy to make food. Using the sun's energy chlorophyll in the leaves is able to turn CO₂ and water into carbohydrates which the plant can then convert into other foodstuffs as needed (aka Photosynthesis). Plants also release oxygen as a byproduct of photosynthesis.

Roots – obtain water and nutrients from the soil. Anchor the plant.

Stem/trunk – transport nutrients and water from the roots to the rest of the plant and also transport food from the leaves to the roots. Stems support the leaves so they can get sunlight.

Seeds/flowers/fruit/cones – Flowers are the reproductive structures of the plant. They produce seeds which can grow into new plants. Seeds may be free or contained in fruits or cones.

3. Ask students what they think would happen to their tree seedlings if their requirements for air, water nutrients, and light were not met? For example what would happen they didn't water their seedling or if they put it into a box?

References

1. Varner, Collin. 2002. Plants of Vancouver and the Lower Mainland. Raincoast Books.
2. Pojar, Jim and Andy MacKinnon. 1994. Plants of Coastal British Columbia. Lone Pine Publishing.
3. British Columbia Ministry of Forests. 1999. Forests in Focus.

Extension of Lesson Plan

1. Plant seeds to determine the consequences of what happens if their needs for water, light or nutrients are not met.
2. Form a human tree. See "How does a tree work?" in Forests in Focus.
3. Leaf and bark rubbings.



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Phone: (604) 465-5411; www.prtgroup.com.


Scientist: _____

Date: _____

Producers

Leaves

Conifer



Broad-leaf tree

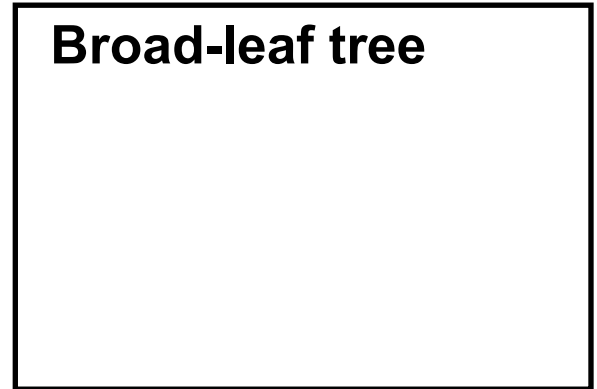


Bark

Conifer



Broad-leaf tree



Roots

Conifer



Broad-leaf tree



**Tree
shape**

Conifer

Broad-leaf tree

Fill in the blanks.

1. Producers use the _____ to make food.

2. Conifer trees have special leaves called _____

3. Broad-leaf trees have _____ leaves.

4. _____ keep their leaves all year.

5. _____ lose their leaves in the _____

They grow new leaves in the _____

deciduous trees	fall	wide	evergreen trees
sun	needles	spring	