

**TEACHING KATE
TEACHING KIDS ABOUT THE ENVIRONMENT**

PLANTS IN COMPETITION

Grade Level: 7

Time Required:

SC Science Standards

This lesson plan was correlated with only the grade level specified unless otherwise noted.

Grade 6:

- I. A. 1. a 1
- I. A. 1. b 1, 2
- I. A. 1. d 1
- I. A. 2. b, d, g, h
- I. A. 3. A.
- I. A. 7. a
- II. C. 1. b

Grade 7:

- I. A. 1. a 1
- I. A. 1. b 1, 2
- I. A. 1. d 1
- I. A. 2. b, d, g, h
- I. A. 3. a
- I. A. 7. a
- II. B. 1. a, b
- II. D. 3. a, b

Purpose

Students will gain an understanding of the conditions plants need for successful growth. They will learn that plants must compete for these needs. They will also observe the effects of insufficient light on the leaves of plants.

Skills

Describing, drawing conclusions, hypothesizing, measuring, observing.

Concepts

Light, water, nutrients and space as needs of plants, competition of plants for these needs, process of photosynthesis.

Materials Needed

Milk Cartons	Scissors
Potting Soil	Seeds
Water	Hand Lenses
Rulers	Pieces of Cardboard
Large Paper Clips	Worksheet
Pencils	Paper
Rigid or Plastic Coated Paper Plates	

Definition of Terms

<u>Chlorophyll</u>	A group of green pigments that produce the green hue of plants, essential to photosynthesis.
<u>Competition</u>	The struggle among trees and other plants for nutrients, water, light, space and other requirements for existence. Competition goes on among both the roots and crowns of trees.
<u>Conclusion</u>	An explanation on the data collected during an experiment.
<u>Germinate</u>	To begin to grow or develop, to sprout.
<u>Hypothesis</u>	A guess made after collecting information, usually subjected to testing for its validity.
<u>Photosynthesis</u>	The process by which green plants manufacture simple sugars in the presence of sunlight, carbon dioxide and water. Chlorophyll is essential to the series of complex chemical reactions involved.

Before the Session

Have students save milk cartons from their lunch for Activity 1. Also, determine how much space you have for plants to grow, in order to decide how many students to have in each group. For Activity 2, locate some plants or trees which have leaves the students can reach and that are safe for students to touch.

Background Information

In order to grow successfully, a plant's needs must be met. These needs include plenty of water, nutrients, space and food. Plants take in water and nutrients through their roots from the soil. Plants are able to make food if they receive energy from the sun. This process is called photosynthesis, which literally means "putting together with light."

In trees photosynthesis takes place in the leaves. If sunlight and chlorophyll are both present, then water from the roots and carbon dioxide from the air will combine to form glucose, a simple sugar. This sugar is used by the plant for food.

If a plant's leaf is unable to get enough light, photosynthesis will slow down or it may even stop. If the leaf receives no light, chlorophyll production will stop and the leaf will begin to turn yellow. Eventually it will turn brown and drop off.

Sometimes plants must compete for the things they need. If their needs are not met, they may grow slowly or die.

Suggested Lesson Plan

Activity 1

1. Engage class in a discussion of what seeds need to germinate and grow.
2. Have students work in groups to do the following activity:
 - a. Instruct students to cut three milk cartons so that each has a height of 3 inches.
 - b. Punch a few holes in the bottom of each carton and place them on the paper plate.
 - c. Fill each carton with 2 1/2 inches of potting soil.
 - d. Place 2 seeds in one pot, three seeds in another pot and five seeds in the third pot. Cover with a thin layer of soil and pat soil lightly.
 - e. Water all pots so that soil is moist.
 - f. Place pots in a lighted area.
 - g. On the worksheet, make a hypothesis.

3. Have students check their planters daily. The soil should be watered if the surface is dry. When seeds have germinated, have students thin to 1, 2 and 4 seedlings in the three cartons. Students should use hand lenses to examine removed seedlings and record their observations on the worksheet.
4. The day after germination takes place have students begin measuring the height of their plants from the soil surface to the uppermost point on the plant. In pots with more than one plant, have students determine the average height. Record heights on the data table found on the worksheet.
5. After sufficient time, tell the students to stop watering their plants. Record daily observations on the worksheet.

Activity 2

6. Activity 2 can be done in conjunction with activity 1.
 - a. Have students cut, from a piece of cardboard, a shape (circle, square, triangle, etc.) that is no more than an inch at its widest point.
 - b. Using a paperclip, students should attach their “patches” to the leaf of a tree as directed by the teacher.
7. Engage the class in a discussion of photosynthesis.
8. After approximately four days, take students back to their tree to remove their “patch” and make observations. Have them describe their observations on the worksheet.
9. Explain to class that after a scientist completes an experiment, he/she must then draw a conclusion. A conclusion is an explanation of the data collected during experimentation. Have students work in their groups to write a paragraph stating their conclusion.
10. Have a spokesperson from each group share the group’s conclusions with the class.

Application

In order to manage our forest resources wisely, it is important to understand how trees grow and under what conditions they are able to reach optimal size. In harvesting and replanting a forester must make decisions which will insure the future of the forest.

Extensions

Take students on a walk to look at trees and examples of competition.

Resources Available

Environmental Education Activity Guide (PLT). 1993. American Forest Foundation.

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WORKSHEET

Name:

Date:

Activity 1

I. Making a Hypothesis — complete the following sentence. If plants are grown too close together, then _____

II. Observations - In the space below draw a germinated seed.

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WORKSHEET**

Name:

Date:

IV. Table 2 - Plants Without Water

Date	Observations

Activity 2

V. Observations - In the space below describe what you saw when you removed your patch.