

Every Tree For Itself



Objective: Students will simulate how trees compete for their essential needs and describe how varying amounts of light, water, and nutrients affect a tree's growth.

Illinois State Goals: 11.A.2d; 11.A.2e; 11.A.1f; 12.A.2a; 12.A.3a; 12.B.3a

Assessment Frameworks: 11.4.03; 12.4.04; 12.7.26; 12.7.27

Suggested Reading:

IAITC Tree Ag Mag

Farmer George Plants a Nation by Peggy Thomas (ISBN-13: 978-1590784600)

I Can Name 50 Trees Today! by Bonnie Worth (ISBN-13: 978-0375822773)

The Tree Farmer by Chuck Leavell & Nicholas Cravotta (ISBN 1-893-622-16-19)

Materials Needed:

Tree trunk or branch cross-sections

Three colors of poker chips (red, white, blue)

Pieces of paper or paper plates

Background:

What do trees need so they can grow? Some of their needs are the same as those of people and other animals. For example, trees need plenty of water. They also need plenty of nutrients, which they get from food. But trees and people don't get food in the same way. Plants make their own food by using energy from the sun.

If trees don't get enough water, nutrients, or sunlight, they may grow slowly or die. Growth rings show this graphically. In general, wide rings indicate good conditions for growth (plenty of nutrients, water, and sunshine) while narrow rings often indicate less favorable conditions for growth (drought, insect damage, lack of nutrients, competition.)

Directions:

1. Pass out cross-sections from several trunks or branches (tree cookies), and have your students examine the growth rings. (If you don't have an actual cross-section, draw a big one on the chalkboard.) Explain that the number of rings indicates a tree's age.
2. Give a large piece of paper or a white paper plate to each student.
3. Tell students to imagine that they are trees.
4. Have students stand about three feet apart on their cross-sections. Students must stand in place and must keep one foot planted on their cross-section at all times.
5. Equally distribute the poker chips on the floor around the students so that the chips are about two feet apart.

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Activity Continued

6. Tell students that they'll be playing a game called "Every Tree for Itself." The object of the game is for the "trees" to gather as many poker chips as they can. Explain that each colored chip represents a tree requirement. Blue represents water, white represents air, and red represents nutrients (such as nitrogen, oxygen, or carbon dioxide.)
7. Give a signal to start the first round. Have student "trees" reach with their roots and branches (arms and legs) to gather their requirements. Tell students that one foot (their tap root) must remain planted on their cross-section at all times. They are not allowed to slide their cross-section along the floor or step off it; they will be disqualified for doing so.
8. Allow student trees to gather these requirements for one 30-second round. (They can either collect all types of requirements at once or one type of requirement each round.) Have students use a notebook to record how many of each color requirement they gathered. Use the following questions to discuss the results of the first round.
 - How many requirements did each tree get?
 - Does any tree lack a particular requirement?
 - a. What might happen to a real tree that lacked one of its requirements?

It might grow slowly or eventually die.
 - b. Is there such a thing as too much water, sunlight, or nutrients?

Yes, every species has optimum levels beyond which the tree becomes stressed.
9. Have students stand on their cross sections in groups of three to five. Gather the colored chips and spread them around the room again. Play another round and have student trees record their results.
10. Compare results of this round with those of the first. In most cases, students will notice that each tree gathered fewer requirements. Ask if they can reach any conclusions about trees that grow close to each other. Ask if any trees "died" because they couldn't get a particular requirement.

Lesson Extender:

Try several more rounds, comparing results each time. Suggestions for rounds include:

Have all students stand closer together

Use fewer water chips, representing drought.

Use fewer sunlight chips, representing lack of sunlight due to overcrowding

Use fewer nutrient chips, representing poor soil quality

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