

Trees Have Needs Too!

Essential Question(s):

*What do trees need to grow?
How can competition or human development interfere with tree growth?*



At a Glance:

Learners will play an interactive, competitive game of sticker tag to learn about what trees need to grow: water, nutrients/food, and sun.

Background Information:

Review *How a Tree Works* for additional background information.

Trees have certain needs for growth and survival just like other living organisms. Like humans, trees need water and nutrients from food to grow. Trees also require sunlight to make their food through the process of photosynthesis. If trees lack any of these three necessities, water, nutrients, and sun, they may slow their growth or eventually die.

The number of rings on the cross-section of a tree relates to the tree's age. Each set of rings represents one year. The light colored, or 'early wood' signifies the wet spring and summer seasons, when growth is accelerated. The dark, or 'late wood' shows the slower growth period during the dryer fall and winter months.

Examining tree rings is a good way to study the conditions of past years' growth. Wide rings usually indicate plenty of nutrients, water, and sun – good conditions. Narrower rings usually indicate that conditions were not so favorable that year or season. This could mean that there was a drought, insect damage, lack of nutrients, competition from other trees, or some type of human-induced impact (i.e. development, pollution, etc).

Trees and other plants are not able to move to find their resources like many other living organisms. They are limited to the water, nutrients, and sunlight available to them. Drought, insect damage, lack of nutrients, competition from other trees (succession of taller trees compete for sunlight), or human impacts can affect the growth and survival of trees. When conditions are poor, trees will slow their growth and may not produce as many seeds to compensate for lack of water, nutrients, or sunlight. If these needs are not met, the tree will eventually die. When conditions are good, trees grow taller and wider, they produce many seeds (mast), and are healthy members of the ecosystem.

Location: Indoors or outdoors

Objectives: Learners will

- 1) state three things trees need to grow and survive.
- 2) determine the age of a tree by counting growth rings
- 3) interpret the relationship between tree growth and environmental factors such as rainfall, soil quality and sunlight.
- 4) relate competition and human development to tree survival.

Skills: cause and effect, relationships, interpretation

Supplies:

- tree cookie or diagram of a cross-section of a tree
- paper plate
- markers, crayons, or colored pencils
- 1-2" green, yellow, and blue circles or dot stickers

Subjects: science, physical education

Procedure:**Part 1: Tree Cookies** (Part 1 is not a necessary precursor for Part 2, but is a good introduction)

1. Discuss how trees need water, nutrients, and sun to grow and survive. Without any of these, the tree's growth will slow, and it may eventually die.
2. Show learners a tree cookie or diagram of a cross-section of a tree. If available, pass a few tree cookies around for close inspection. Tell learners that each set of tree rings (light and dark) represents one year of life. Discuss the growing seasons and impacts that may affect growth (drought, insect damage, lack of nutrients, competition from other trees, or some type of human-induced impact).
3. Pass out a paper plate to each learner along with coloring utensils. Have learners imagine they are trees. They are to draw a cross-section of a tree, representing how old they are in annual rings.

Part 2: What a Tree Needs

1. Go outside or to an indoor open area where the kids have room to run around. Set boundaries for the game.
2. Explain to the learners that they are going to be trees and will be trying to obtain all their tree needs: water, nutrients, and sun. These needs will be represented by colored stickers: blue for water, green for nutrients, and yellow for sun.
3. Place 2 or 3 stickers on each learner's back (try to divide the colors up somewhat evenly for the first round).
4. The object of the game is for each learner (or tree) to have one sticker of each color, representing the tree-needs, on the front of their shirts at the end of the round. Learners are to run around and try to take the stickers off other learners' backs. When a sticker is taken, they are to place it on the front of their shirt and it cannot be taken off. If all three needs are obtained, the learner may stand 'majestic' with their arms spread overhead like a tree. If they still have a sticker on their back, it may not be taken at this point. End the game when most learners have obtained their needs and are standing 'majestic'.
5. Discuss how trees have to compete for limited resources. Why may it be harder for trees to get all the resources they need? (They can't move!)
6. Other rounds may be played by reducing the number of one color sticker to represent different environmental conditions: less blue=drought; less green=pollution, invasive species, or overcrowding; yellow=succession of taller trees, buildings that block the sun (human development). Less learners/trees will be able to meet all their needs and stand 'majestic'. Discuss how trees will slow their growth when there are poor conditions, but will eventually die if conditions don't improve.

Discussion/Assessment:

What do the rings in a tree's cross-section represent?

What do trees need to survive?

How do trees compensate in years with poor growing conditions?

What type of human impacts can interfere with tree growth and survival?