



Table Rocks Curriculum

Forest Health

Objective: Students will understand the essential components of a healthy forest. Sunlight, nutrients, and water will be discussed with emphasis on space and why it is necessary for a healthy forest.

Benchmarks Targeted: 1, 2 and 3 (1-8)

Oregon Standards:

Subject Area: Life Science

Common Curriculum Goals: Diversity/Interdependence: Understand the relationships among living things and between living things and their environments.

Benchmark 1: Describe the basic needs of living things.

Benchmark 2: Describe the relationship between characteristics of specific habitats and the organisms that live there.

Benchmark 3: Identify and describe the factors that influence or change the balance of populations in their environment.

Length of Lesson: 15-30 minutes

Materials Needed:

- ✓ A space large enough to fit the whole class comfortably
- ✓ Method to form two circles, one inside the other, in which the class can fit, for example:
 - Use sidewalk chalk and draw two circles on the pavement
 - Use two long ropes or string
- ✓ Poker Chips (red, blue, and white)
 - Mark at least two chips with an "x" using a marker
 - Have at least one chip of each color per student, plus some extra

Key Vocabulary: *competition, dormant, lateral root, resources, tap root*

Procedure:

Preparation:

Outline two circles, one within the other, with both circles big enough to fit the entire class. Have the students stand in the smaller circle first.

Activity:

Ask students what *resources* trees need to grow (sunlight, water, nutrients). Explain to them that their right foot is their *tap root* and cannot move from its position. This root provides them with stability. Their left foot is their *lateral root*, which soaks up nutrients and water from the soil; it can move. Their arms are their branches, soaking up sunlight and gathering food from the leaves. Have students start as *dormant* seeds, sleeping in a crouched position.

Walk through the students with a box of poker chips (red= sun, white= nutrients (oxygen, carbon dioxide, sugar, etc), blue=water), dispersing them evenly throughout the circle, including outside the circle but within reach of the border. Once all poker chips are dispersed, allow students (trees) to wake up and gather as many poker chips as they can from wherever they are standing without moving their *tap root* (right foot). Once they have gathered all they can, ask the trees who did not gather at least one of each color to sit down where they are standing; these trees did not get enough nutrients to survive. Take note of who did survive. Usually it is the less crowded trees and trees on the boundary of the circle that have less *competition* for available *resources*. Talk about *competition* and how real trees compete to reach the sunlight and to soak up sufficient nutrients and water.

Ask the students, including the dead trees, to look at their poker chips and see how many have one with an “x” on it. Explain that the “x” represents fire. Ask those with an “x” to spread the fire by tagging as many other trees as they can. Remind students that they can move their *lateral roots*, but not their *tap root*; and the other trees can do the same to avoid getting tagged. Give the trees a few minutes to spread the fire. Within a short amount of time fire should reach the majority of all of the trees. Discuss other factors that either encourage or inhibit healthy tree growth such as space, pests, disease, and drought.

Begin the second round by allowing the students to spread out into the larger circle as well as the smaller one. Repeat the same procedure as before and change the “x” to represent a different type of natural disturbance or threat to a forest’s health such as disease, pests or drought. See how many resources the trees can gather now. Do more survive? Did some get more nutrients than before? Does it appear to be a healthier forest? Again, ask who has an “x.” Is the disease, pests or drought able to spread as far this time? Discuss how space affected the growth of the trees and/or natural disturbance.

Extension:

At the beginning of the lesson, when students are dormant, have them sprout as a tree would sprout, going through all the steps.

- 1) Curl up like a little ball- you’re a seed
- 2) Uncurl your fingers- you’ve sprouted
- 3) Wiggle your toes- you’re taking root
- 4) Stick up one arm - you’ve grown a branch
- 5) Stick up the other arm- you’ve grown another branch
- 6) Wiggle your fingers- you grow lots of leaves
- 7) Stand up (feet together)- you grow tall
- 8) Spread feet apart- you spread out lots of roots

- 9) Wiggle your toes- you grow lots of little roots (rootlets)
- 10) Make a “thppt” sound- you are sending out lots of seeds
- 11) Sway from side to side- the wind is blowing you.
 - Are you running into your neighbor?
 - Do you have enough space to keep growing?

Explain that the **tap root** (right foot) cannot move because it goes deep down into the ground giving the tree stability while the **lateral root** (left foot) can pivot around the right foot soaking up water and nutrients from the soil. Have students try to gather the nutrients they need as a test to see if they have enough room to grow. Continue with activity as described above.