



Lesson Plan Information

Estimated Duration: 1 hour inside,
1 hour outside

Materials: Activity 1: Seeds, metric rulers, magnifying glasses, woolen socks or mittens, flannel blankets, small containers, masking tape; Activity 2: Magnifying glass, tweezers, seeds, water, paper towels

Setting: Indoors and Outdoors

Curriculum Links: See table of curriculum links on www.focusonforests.ca

Key Vocabulary: Seeds, seed dispersal, nut, cone, pod

PRIMARY/JUNIOR

SEED COLLECTIONS

Teacher Background

Seed dispersal

Seeds travel. Sometimes they may travel only a few feet from their parent plant, or sometimes they can travel kilometers away. Nature has designed seeds in the right way so that they can travel.

The wind plays an important role in carrying seeds that are very light. Maple trees have seeds called keys (or samaras), that are specially designed to fly. Their “helicopter-type” flight brings the seed safely down to the ground. Some seeds found within cones have “wings” to help them catch the wind.

Acorns are heavy and large seeds. This makes it difficult for them to travel since they can only bounce so far. These larger seeds have more “food” resources stored up in them, so they can wait for the right time to grow. The extra food in an acorn is tempting to some animals. Squirrels gather acorns, and will carry them and hide them for food. If squirrels don't find an acorn, it may eventually grow into a tree.

Some seeds “hitchhike” on the fur of animals. These seeds have special parts that help them to stick to fur (much like Velcro). Eventually some seeds will fall off and may land in a spot with the right conditions in order to grow into a tree. Some seeds, like the locust, have another unique way of getting their seeds to travel: their exploding seed pods send seeds flying into the air. Other tree

seeds, like the jack pine, depend on fire before their cones can open up to disperse seeds. Finally, some birds eat seeds, which are often not destroyed by the process of digestion; in this way, through bird droppings, some seeds are dispersed quite a distance from the parent plant.

It is important for seeds to disperse away from their parent plant so they can avoid competition for water, nutrients and light and have a better chance of surviving.

Structure of a Seed

There are generally three parts to any seed: the outer covering, an embryo, and food supply. The outer covering, known as the seed coat, plays an important role in protecting the seed from insects, disease and damage. The embryo is the source of the plant structure. The food supply surrounding the embryo plays an important role in supporting the plant as it begins growing in the soil and establishes (much like an egg) Seeds with larger food supplies (think of an acorn) will supply the growing plant with more food for a longer period of time before it establishes, potentially increasing its chance of survival. However, these larger seeds also require a lot more energy from the parent tree to create, so trees may not be able to make a lot of seeds.

Focus on Forests



Activity 1

- Step 1** Ask students to bring in seeds collected from trees in their neighbourhood, or take your class on a seed hunt in a nearby park or forest, making sure that the park is public, or if it is private land that you gain permission prior to collecting seed. Collect seeds using one of the following methods:
- Have students walk through a park or forest wearing an old pair of big wool socks or mittens over their shoes. Afterwards, have them carefully remove and examine their socks or mittens. Are they covered with various types of seeds? If so, have them carefully pick them off for use later in this activity.
 - Gently drag an old flannel blanket over part of the park or forest. Remove and examine seeds sticking to the blanket.
 - Have students walk around a park or forest looking for different types of tree seeds that may not be easily picked up through the other methods.
- Step 2** Each student should bring to class a small container in which they can place seeds.
- Step 3** Observe the various seeds. Discuss the seeds' similarities and differences. Have students question and discuss how each seed was dispersed.
- Step 4** Divide students into small groups. Encourage them to devise their own classification systems and sort their seeds according to these systems. Their ideas might include sorting by size, shape, colour, texture, or dispersal method (e.g. hitchhikers, bouncers, flyers, helicopters).
- Step 5** In a large room or outdoors, have students stand in scatter formation holding their seeds. On the count of three, have them disperse their seeds by throwing them up into the air. What happens to the seeds? Have them record distances traveled by the different seed types. Discuss findings. Discuss with students why seeds need to disperse.

Extensions

Have groups of students investigate the different ways that seeds travel, and why, and prepare to present their report to the class.

Have students find one example of a seed that uses each of the following basic methods of seed dispersal:

- Hitchhiking • Bouncing • Flying • Animal • Slingshots • Parachutes • Helicopters

Activity 2

- Step 1** From seeds collected in the previous activity, have students examine the seeds carefully, using a magnifying glass to examine the similarities and differences among the seeds and seed coats. Have them describe how the seeds feel, smell, or look like. What do they think they will find inside each seed?
- Step 2** Since tree seeds are often very small and do not germinate as quickly, bean seeds should be used for the rest of this activity. Soak bean seeds overnight. Ask students to compare the differences between the soaked seed and the dry seed.
- Step 3** Using tweezers, demonstrate how to peel away the seed coat. Try using the tweezers to pull apart the fleshy seed parts that contain the food supply (cotyledon).
- Step 4** If they are careful, students will find a complete plant embryo (roots, the beginnings of a stem, tiny leaves). Discuss the changes that occurred during the overnight soaking. Explain to students that even though this is a bean seed, that similar results would occur for tree seeds.
- Step 5** Have students sketch and label the different parts of the seed. Discuss with students why seeds are different sizes. How might it impact a tree if a tree seed has a small or large food supply?

Extensions

Ask students to separate the collected seeds based on the amount of food supply they think each seed has. Ask them to explain to the class why a seed would or would not have a large food supply.

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