



LESSON SUMMARY

Students will collect seeds to study their structure and various dispersal methods.

Activity Information

Grade:	Primary/Junior
Estimated Duration:	2 hours (1 indoors, 1 outdoors)
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 towel.
Setting:	Indoors/Outdoors
Key Vocabulary:	Seeds, seed dispersal, nut, cone, pod
Learning Goals:	<ul style="list-style-type: none">• Students will become familiar with common dispersal methods for tree seeds;• Students will learn the structure of tree seeds and how these structures help seeds to survive.

Curriculum Connections:**Grade 1****Science: NEEDS AND CHARACTERISTICS OF LIVING THINGS**

2.3 investigate and compare the physical characteristics of a variety of plants and animals, including humans (*e.g., some plants produce flowers and some do not; most plants have roots; some animals have two legs, while others have four; all animals have sense organs*).

Grade 2**Science: UNDERSTANDING EARTH AND SPACE SYSTEMS AIR AND WATER IN THE ENVIRONMENT**

3.3 identify ways in which animals are helpful to, and ways in which they meet the needs of, living things, including humans, to explain why humans should protect animals and the places where they live (*e.g., bats control mosquito populations; birds and wildlife provide pleasurable viewing experiences; the buffalo provided some Aboriginal people with everything they needed to survive: food, shelter, clothing, tools, ornamentation, and weapons; horses can be used for labour; cats and dogs provide companionship for humans; animals, including humans, disperse plant seeds*).

Science: UNDERSTANDING LIFE SYSTEMS GROWTH AND CHANGES IN ANIMALS

3.3 describe ways in which living things, including humans, depend on air and water (*e.g., most animals, including humans breathe air to stay alive; wind generates energy, disperses seeds; all living things need to drink or absorb water to stay alive; water is used for washing and bathing, transportation, energy generation*).

Grade 3**Science: UNDERSTANDING LIFE SYSTEMS GROWTH AND CHANGES IN PLANTS**

2.2 observe and compare the parts of a variety of plants (*e.g., roots of grass, carrot, dandelion; stem of cactus, carnation, tree; leaves of geranium, spider plant, pine tree*).

3.3 describe the changes that different plants undergo in their life cycles (*e.g., some plants grow from bulbs to flowers, and when the flowers die off the bulb produces little bulbs that will bloom the next year; some plants grow from germination of a seed to the production of a fruit containing seeds that are then scattered by humans, animals, or the wind so that new plants can grow*)

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 to travel in many ways.

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 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. 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 stick to fur much like Velcro. Eventually some seeds will fall off and may land in a spot with the right conditions to grow. Some seeds, like locust, have another unique way of getting around: their exploding seed pods send seeds flying into the air. Other tree seeds, like the jack pine, depend on fire to open their cones and 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 their parent plant.

It is important for seeds to disperse away from their parent plant so they can avoid competition for water, nutrients and light increasing their 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 supports 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.

Activity #1

Seed dispersal

Step 1 Ask students to bring in seeds collected from trees in their neighborhood, or take your class on a seed hunt in a nearby park or forest in a nearby park of forest. Make sure that the park is public, or if it is private land that you gain permission prior to collecting seeds. Collect seeds using one or more 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 later use 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 the 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 have a small container in which they can place their seeds.

Step 3 Observe the various seeds. Discuss the seeds' similarities and differences. Have students theorize 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.

Step 5 In a large room or outdoors, have students stand in a scatter formation holding their seeds. On the count of three, have them disperse their seeds by throwing them up in the air. What happens to the seeds? Have them record distances traveled by the different seed types and discuss findings. Discuss with students why seeds need to disperse.

Extensions

Have groups of students investigate the different ways 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 Use a magnifying glass and examine the similarities and differences among the 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 difference between soaked seeds and the dry seeds.

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 seed has a small or large food supply?

Extensions

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