Seeds on the Go!

In a Nutshell

By collecting, sorting and examining seeds, students will discover the variety of ways seeds travel and how these methods of seed dispersal benefit plants and wildlife.

Grades	3
Seasons	Fall
Location	Visitor Center

Learning Objectives

After participating in this activity, students will be able to:

- name at least three everyday products they depend on that originate from seeds.
- list at least three ways that seeds may travel.
- explain why it is important that seeds disperse.
- provide at least two examples of ways wildlife use and depend on seeds.

Literature Connections

How and Why Seeds Travel by Elaine Pascoe
The Lotus Seed by Sherry Garland (AD880L)
The Dandelion Seed by Joseph Anthony (AD490L)
Glenna's Seed by Nancy Edwards
The Reason for a Flower by Ruth Heller (NP)
In a Nutshell by Joseph Anthony (AD540L)
Seeds by Ken Robbins

Pre- Visit Suggestions

Project PLT activity, Have Seeds, Will Travel (modified)
Students observe, sort and classify seeds.

Create a SEED Word Map
Ask students to look up the meaning of the word "seed' in the dictionary. What are some ways this word is used to mean different things? The book,

Glenna's Seeds by Nancy Edwards, illustrates another meaning for the word "seed."

On-site Activities

Students will discover the three main methods for seed dispersal. During a hike on the Wildlife Refuge, students will locate and collect seeds. Students will use the seeds to create a seed chart.

Classroom Connection

Project PLT activity: *Have Seeds, Will Travel*
Follow any of the extension activities that incorporate math and upper level contrasting and comparing.

Classroom Seed Collection
Ask students to bring in seeds they find in their neighborhood or outside. Add these new seeds to your classroom collection. Name the seed (when you can) and classify it by the way it travels. Count and graph the number of seeds the class collected, using the seed dispersal method. Which methods appear most common? Which method was the least common? What might be some reasons for this difference? Talk about percentages. Which percentages of the total appeared to be wind carried? What percentage of seeds were hitchhikers?

Diary of a Seed
Ask students to write a story or journal entry from the viewpoint of their favorite seed. How did this seed start its life? Who were the parents? How does it travel? Where is it going? What does it see and experience along the way? What other seeds does it meet? Encourage students to illustrate their story through the seasons. If a student needs an example read Dandelion Seed by Joseph Anthony or Diary of a Worm by Doreen Cronin.

Teacher Resources

Ready, Set, Grow! by Mary Hoff, MN Conservation Volunteer Magazine
Teachers Guide
http://www.dnr.state.mn.us/young_naturalists/teachersguides/index.html
Winter Weed Finder by Dorcas S. Miller
A Guide to Nature in Winter by David Stokes
Discover Nature in Winter by Elizabeth Lawlor

Seeds on the Go!
Pre-Visit Activities

Materials

- Seeds: various types and dispersal methods (5 per group of 3 students)
- A fruit or vegetable with a large seed (apple or avocado)
- Umbrella
- Flashlight
- Acorn
- Spray bottle filled with water

Introduction

The following activity has been adapted from the Project Learning Tree Activity *Have Seeds, Will Travel*. To conduct this activity, a refuge seed collection is available, or you can use a Classroom Seed Collection built by students who bring in seeds they found in their neighborhood or outside.

Activities

Divide students into groups of three. Provide each group an assortment of seeds from the collection. Ask groups to examine their seeds and invent a system they will use to sort or classify the seeds. Invite each group to share their chosen method for sorting and classifying.

Lead a group discussion about the structure and function of seeds using questions similar to the following:

- What is the purpose of a seed? (Reproduction, to produce new plants)
- How do plants spread their seeds? (Carried on the wind, carried or eaten by animals)
- What do all plants need to survive? (Sunlight, water, and soil)

Use the following demonstration to explain to students why it is important for seeds to "escape" from under their parent plant.

- Invite a student volunteer to hold and stand under an open umbrella. Place an acorn at the student's feet. Shine a flashlight down on top of the umbrella. Ask the students "*Will the acorn get*

the sun it needs to sprout and grow under the shade of the parent oak tree?" Use a spray bottle filled with water to simulate rain. Ask students "*Will the acorn get enough of the water that it needs to grow under the shelter of the parent tree?"*

Wrap-up

Explain to students that plants are important sources of wildlife food and shelter in healthy habitats. Minnesota Valley National Wildlife Refuge is home to many kinds of plants. To assure survival, each plant is designed to disperse its seeds in the most effective way possible. During the fieldtrip to the refuge, students will further investigate types of seeds and dispersal methods from a variety of refuge plants.

Advise student to dress appropriately for the outdoor field trip to the National Wildlife Refuge. Appropriate clothing for outdoor activities should include: good walking shoes, pants, jackets, and long sleeved shirts.

Seeds on the Go!
On-site Activities

Materials

- Seed Collection- labeled with plant names
- Magnifying Glasses (1 per group)
- Cardstock Copy of Seed Chart (1 per group)
- Clear Plastic Page-Protector (1 per group)
- Pencils
- Glue Bottles
- Tweezers
- Paper Plates
- Brown Paper Bags (1 per group) for seed collection
- Winter Weed Finders or photos to identify seeds

Introduction

Inside Visitor Center (20 minutes)

To begin the activity and to capture student interest in seeds, write the word "Seed" in the center of the board.

Ask students to brainstorm various items people use today (like food, clothing, and manufactured products) that originated from a seed.

Write these words around the outside edge of the board. As students provide suggestions, ask them to relate the steps back to seeds as you write the connections on the board.

For example:
a hamburger came from a cow, which grazed on grass, which grew from a seed. Using examples of pod and seed designs for each method of travel

found in the *Seed Collection*, lead a brief overview of the three main methods for seed dispersal.

1. **Carried on the Wind**
   These seed designs include parachute type structures, "wings", or fluff that catch the wind. Examples include maple samaras, milkweed "down" and dandelion parachutes.

2. **"Stuck" on Animals** (once referred to as hitchhikers)
   Seeds with prickly spines or hairs that quickly attach themselves to fur or clothing fit into this category. Examples include the burdock (whose design inspired the inventor of Velcro), beggar's tick, and wild licorice.

3. **"Carried" or "Eaten" by Animals.**
   Seeds encased in a fleshy, tasty fruit such as mulberry and wild grape are eaten and then dispersed by animals through their scat. Some nuts, like acorns, are forgotten in a cache (food stash) or buried and forgotten, left to grow far from the parent plant.

Hike

Forest, Prairie and/or Wetland (60 minutes including the following instructions)
Explain to students that the entire class will visit three habitats (dependant upon location) to look for seeds: prairie, forest, and wetland. Assign at least one adult per group to lead the hike. Give each team a paper bag for seed collection.

Show them the journal page they will collect their "data" on once they return from their hike. Discuss the collecting rules:

This is NOT a Competition.
The objective of this activity is to collect as wide a variety of seeds as possible. Please remind students that many of the animals that live in the refuge depend on plant seeds for food during the winter. Students should collect only a small portion of the seeds they find. Explain to students they only have a small space to work with on their cards and will not be able to glue large pods, (for example, an entire cattail) to their seed chart.

Be an Ethical Collector
Where can I collect?
The types of natural artifacts people are allowed to collect depends on the location where they are collecting. Places like National Parks, National Wildlife Refuges, State Parks, and some conservation areas do not allow people to take any kind of natural artifacts. Engage students in a conversation about why this would be an important rule for places like State and National Parks and Wildlife Refuges. City and county parks are usually less concerned about collecting natural artifacts because these areas are set aside for recreation, generally not for high quality or unique habitats. Encourage students to always ask, read signs, or pick up brochures to understand the rules about collecting natural articles in the places they visit.

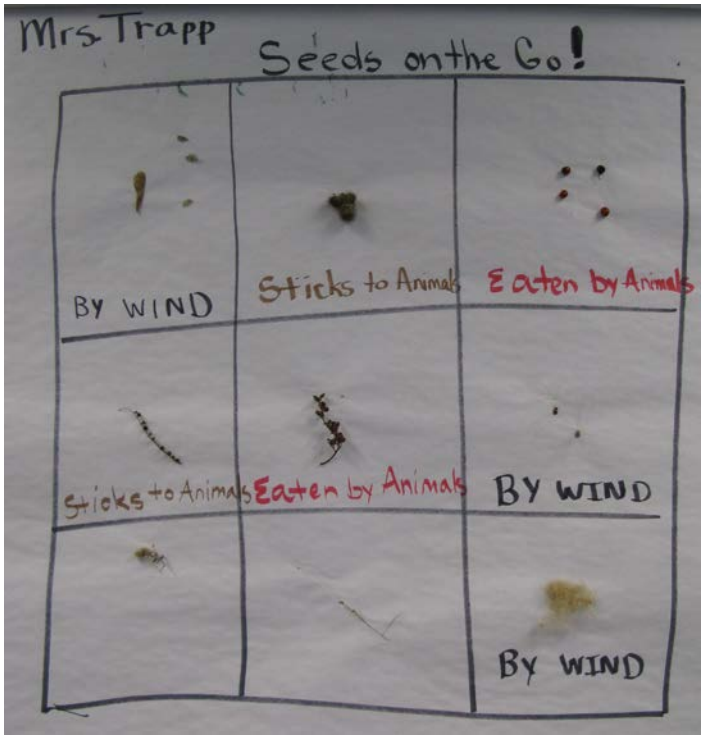
Reasons People are NOT Allowed to Collect from National Parks, National Wildlife Refuges, State Parks, and some conservation areas:

- Collecting can reduce the amount of natural foods available for animals to eat that live in these natural areas.

- Uncontrolled collecting of plants and animals can reduce population sizes to a point where plant and animal populations can become threatened or endangered.
- Because many people visit these natural places, even the smallest number of visitors collecting can have a big impact and can harm the quality and health of a protected area.

When it's OK to collect, and how much should I take?
How much you collect and how you take the collection are both important parts of collecting. An example, in Sanibel Florida, the "shell capital of the United States," people are allowed to take as many shells from the beach as they wish as long as there are no living animals still inside the shells. However, think about what would happen to the beach on this island if everyone took every shell they found? Ask the students how to determine when you have collected enough. What makes a really good collection? Is it just the amount you have or is it the variety of your collection that matters?

It is also important to think about how you collect. Is it OK to trample through wildflowers on your search for rocks? Is it OK to pull an entire plant out of the ground if you want to press one of the flowers? Ask students for ideas on how they can protect the habitat where they are collecting.



Seed Chart

Classroom (20 minutes)
Back in the classroom, give directions before passing out any materials. Use a poster sized example chart as you explain the journal data sheet.

1. Begin by emptying you bags onto a paper plate.

2. Use the magnifying lenses to determine how the seeds would travel.

3. Then organize seeds by

sorting them into similar groups on paper plates.

4. Use the glue to adhere the seeds to the seed charts. The easiest method to glue seeds to the chart is to put a small amount of glue on the paper and then use tweezers to place the seeds in the glue.

5. Slide the seed chart into a clear, plastic page-protectors to protect it in your journal

Now pass out journal seed charts, magnifying lenses, paper plates, tweezers and plastic page-protectors to each group.

As students are close to finishing their charts pass out the Winter Weed Finders or seed photographs so students can try to identify some of the seeds they collected.

If enough time remains, ask each group to present their chart comparing the seeds they collected with those collected by other groups.

Management Connection- The Value of a Seed

Classroom (10 minutes)

Many animals depend on seeds throughout the year. Some must stock up and store seeds in order to survive cold winters (squirrels, mice, muskrats). Other animals may use parts of seeds to line their nests or homes. Since animals rely on seeds, promoting the growth and reproduction of native plants in the appropriate habitats promotes wildlife health.

Seed collecting can be a valuable resource management tool to promote the continued restoration of endangered habitats. Prairie seeds collected on refuges can be used to establish additional prairie habitats. Sometimes the seeds are planted and sprouted in greenhouses. The young seedlings, referred to as plugs, are then planted in areas that were once prairie.

However, unlike our collection in this activity, biological seed collecting is a very controlled activity. First, only specific native plants, those known to be originally part of the prairie community are collected. Next, seeds are separated by species. Perhaps biologists are interested in

collecting seeds from three different types of prairie flowers: lupine, butterfly weed, and purple coneflower. Lupine seeds would be collected from the lupine seed pods and held in their own paper envelopes, separate from any other seeds being collected.

TEACHERS PLEASE NOTE

DON'T SPREAD THE PROBLEM!

Since we did not collect INDIVIDUAL plant seeds, our seeds can't be used for future habitat restorations. We also can't be sure that we didn't collect non-native "weed" seeds in this activity. Helping to spread weedy seeds actually harms the very habitats we are trying to protect. For this reason **please deposit the unsued portion of the seeds you collected in the classroom trash containers.**

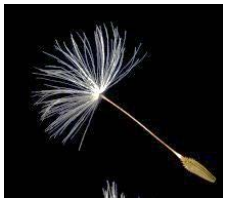
THANKS!

Naturalist: _____ Date: _____ Location: _____

Weather: _____

Seeds on the Go!

Use a magnifying lens to carefully examine the seeds you collected. Glue at least one seed in each box under the way you think it travels.



Travels by Wind	Sticks to Animals
Eaten/Planted by Animals	**What did you discover about seeds today?** **1.** **2.**

Seeds on the Go!
Rainy Day Hike Alternatives

Indoor Seed Collection

Materials

- Collection of seeds
- Magnifying glasses (1 per student)
- Cardstock Copy of Seed Chart (one per student team)
- Clear Plastic Page-Protector (one per group)
- Glue Bottles
- Tweezers
- Paper plates

Activity

Follow the outdoor activity with the following adjustments. Prior to the fieldtrip, gather a variety of seeds to add to your classroom collection. The seed collection should be large enough for each group to pick at least 5 different varieties for their seed charts. The refuge seed collection may also be available. Ask each group to gather an assortment of seeds from the collection. Remind students **the seed collection is not a competition.** Ask each group to complete the Seed Chart determining the dispersal method of the seeds they chose. Each group should present their chart comparing the seeds they collected with those collected by other groups. Did everyone agree on similar dispersal methods?

Design a Seed

Materials

- Drawing paper and pencils (one per student)

Activity

Ask students to draw a design for a new seed. Request that they write a paragraph about their new seed. The paragraph should include where the seed/plant will grow, how the seed travels, and the value of the seed for wildlife. When complete, ask each student to present their creation to the class.