From Here to There: How do seeds spread?

Objectives
- Students will learn that different plants have different kinds of seeds.
- Students will learn that different seeds have different dispersal or spreading methods.

Methods
Students will practice investigation skills, critical thinking skills and discussion skills to come to a conclusion about an unknown phenomenon.

Time
Three 45-60-minute sessions

Grades
Kindergarten – 2nd grade

Materials
A wide variety of seeds. It is recommended that you go exploring with students to find lots of seeds from a wide diversity of plants. Encourage students to collect as many different kinds of seeds as possible. You will likely have to remind students that seeds come in a variety of forms including fruits or berries, pinecones, nuts/hard case, etc. Great places to look for seeds are wild spaces that are not manicured or garden areas.

It may also be a good idea (although optional) to pre-collect some seeds for students to ensure a wide variety of seed dispersal methods. Some examples (coconut, fruits) are best collected at a grocery store.

Diverse Seed Examples:
- Flying – these should be gathered in nature as the seeds of these plants purchased in a store will have the feathery portion removed.
  - Examples: cottonwood, milkweed, dandelion, maple
- Sticky – these will need to be gathered in nature as they are not likely to be found for sale.
  - Examples: cocklebur, sandbur, beggarstick, bedstraw, Virginia Stickseed
- Fruits/berries - these can be purchased at a grocery store or found in nature.
  - Wild Examples: wild plum, mulberries, spruce/juniper seeds, wild strawberries
  - Grocery Store Examples: strawberries, blueberries, bell pepper
- Exploding – these can be purchased at a grocery store, grown in advance or found in nature
  - Wild Examples: Impatiens, jewelweed
  - Grocery Store Examples: peas still in the pod, okra
- Water – in Nebraska, these are not likely to be found in nature (water lily is the only example), so you are best heading to a grocery store
  - Examples: Water lily (in nature), coconuts, cattail
- Gravity – these can easily be found in nature, but can also be purchased at a grocery store
  - Wild Examples: acorn, walnut, hickory
  - Grocery Store Examples: Walnut (in the shell), Almond (in the shell), etc.
Other Materials:
- Small bags (1 per student)
- Small pool or pan of water (1-2 for the whole group)
- Fan (size does not matter) (1-2 for the whole group)
- Pieces of fabric or articles of clothing (socks, flannel or fleece work well)
- Plates (3-4 for the whole group)
- Knives for cutting open seeds (adults should allow students to cut open fruit/seeds with supervision)
- Copies of the “Seed Data Sheet” (one per student or group of students)
- Pencils
- Clipboards (optional)

Starting the Activity
1. Begin the activity with a discussion on how animals move.
   - Ask students how they would get from their home to school? (car, walk, bike)
   - Ask students how they would get from their home to Florida? (car, airplane, train)
   - Ask students how they would get from their home to China? (airplane, boat)

2. Brainstorm with students how they think a squirrel would get from one location to another. Or, a bird. Or, a frog. Help students come to the conclusion that different animals have different kinds of locomotion or ways of moving from place to place.

3. Ask students how they think a plant – like a tree, soybean plant or goldenrod flower – would move from location to location? Help students understand that plants can’t move. Their roots, which help the plant obtain or get nutrients and water from the soil, are in the ground and prevent the plant from moving.

   Some students may point out that plants move in the wind. Yes! Although the leaves, branches and stems can often move in the wind, the whole plant can not move from place to place.

4. Pose this question to students,
   If a plant can’t move from place to place, how did plants spread across the state or country? For example, Bur Oak trees are found all across the eastern United States. And, although humans can plant new Bur Oak trees in their yards or parks, Bur Oaks had spread across the country before humans started planting them. So how did they spread?

   Or, goldenrod (the state flower of Nebraska) is a common plant found throughout the United States. And, again although humans can plant goldenrod, how did this plant spread throughout the country before people started planting it?

5. Help students come to the conclusion that plants spread through their seeds. And, that there are all different kinds of seeds. Some seeds are long and skinny, some are round and heavy. Some seeds look like needles, others look like prickly cacti.

This lesson provided by the Nebraska Wildlife Education Program of the Nebraska Game and Parks Commission.
Explain to students that you are going to be investigation how seeds can spread from location to location.

*NOTE: Do not tell students that seeds disperse or travel in different ways... students will discover this later.*

**Doing the Activity**

6. Tell students that they are going to be heading outside to collect seeds. They can collect any kinds of seeds they can find – in fact, the more different kinds of seeds they collect the better.

Give each student a small bag to collect their seeds. Head outside to a pre-selected area known for having lots of seeds (overgrown or unkept areas work well, or garden areas)

7. Allow students enough time (30-45 minutes) to collect seeds.
   
   *NOTE: Once seeds have been collected, you may stop the activity and pick-up with the following session.*

8. Once back in side, explore the seeds.
   Ask probing questions about the seeds as students explore:
   - What shape are the seeds?
   - Are they small or large?
   - Which seed is the coolest? Why?
   - Are the seeds smooth or are they textured? What kinds of texture do different seeds have?
   - Do any of the seeds look similar? Compare and contrast seeds from different plants.
   - Do the seeds have a hard cover? Or a soft cover? Or no cover?
   - Do you have to go inside the “seed” to find the actual seed? (for example, if you break open an acorn, you will find the actual seed is slightly smaller inside the hard case of the acorn. Or, if exploring a bell pepper, the seeds are actually inside the fruit. On the other hand, the seeds of a strawberry are on the outside of the fruit.

9. Introduce the pre-gathered or pre-purchased seeds to the students. Ask students to explore these seeds (see questions above). Ask students to compare and contrast the seeds they found in nature and the seeds provided to them.

10. Explain the concept of a “parent plant.” This is the adult plant that produced the seeds. The parent plant produces seeds to reproduce and make new plants of the same kind as the parent plant.

11. Remind students of the discussion you had at the beginning of the activity about how humans and animals get from location to location. Ask students how they think each of these seeds spreads from the parent plant?
12. Explain to students that seeds travel in all kinds of ways. Their job is to look at all the different kinds of seeds and determine how the seeds disperse or move from location to location. Explain that they have lots of different tools – pools of water, fans, fabric, plates and knives – all to help them try to determine how seeds travel.

13. Give each student or group of students a Seed Data Sheet, pencil and clipboard (optional).

14. Let students work individually or in groups to start to investigate seed dispersal. Do not instruct students on the different seed dispersal methods. Allow for investigations, discussions and critical thinking.

   If students need prompting, try asking questions such as:
   - Have you ever seen anything – an object or item - that looks like this seed? What was the object or item? What was the object or item used for?
   - What do you think an animal might do if it were to find a seed like this?
   - Do you know what kind of plant this seed comes from?
   - Have you ever seen a seed like this before? Where?
   - What happens if you put the seed in water? What happens if you squeeze the seed?

15. Provide students enough time (at least 45 minutes) to investigate several (3-5 seeds). Remind students to complete the data sheet for each of the seeds they chose to investigate.

   NOTE: If students are interested in the investigations, you can stop at a mid-point and resume investigations in the next session.

16. Once students or groups of students have investigated 3-5 different seeds, bring all students back together to discuss their findings. Have students or groups that investigated the same seeds discuss their conclusion as to how the seed disperses or travels. Did they come to the same conclusion? What experiments did they do to come to their conclusion?

17. Work as a group to determine the different kinds of seed dispersal.
   - Wind
   - Water
   - Eaten by an animal (and subsequently spread through poop)
   - Sticking to an animal’s fur
   - “Exploding” from the seed pod
   - Gravity falling from the parent plant

   Students may have different names for the different dispersal methods but through discussion come to a consensus on what word your group will use.

18. Ask students why they think different plants have different dispersal methods?
   Why is spreading seeds important for plants?
   Why would all plants not just drop their seeds at the base of the parent plant (gravity dispersal)?
   Why does the way seeds spread matter to humans?
Optional Extensions

1. Place some seeds on a wet paper towel inside a clear plastic bag. Place the bags in a warm location (tapping bags to a sunny window works well and keeps seeds out of the way). Watch the seeds germinate (start growing). You can also place some seeds on the wet paper towels and in the clear plastic bags, but place the bags in a warm dark place, a cold bright place and a cold dark place. Investigate what seeds need to start growing.

2. Invite students to plant some of the seeds they found. Discuss plant life cycles as the plants grow. Try to get the new plants to grow until they produce seeds thus completing the plant life cycle.
Name(s): ____________________________________________________________________________________________________

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<tr>
<th>Seed</th>
<th>Draw Your Seed</th>
<th>2 Words to Describe Your Seed</th>
<th>Data From Your Experiments</th>
<th>How do you think your seeds travels?</th>
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<td>Example</td>
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<td>puffy white</td>
<td>- goopy in water&lt;br&gt;- didn’t fall fast&lt;br&gt;- floated in the air</td>
<td>air or wind</td>
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