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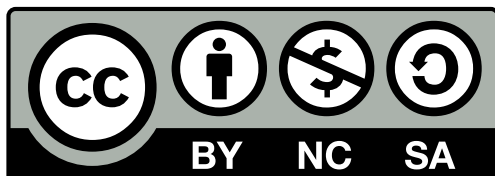
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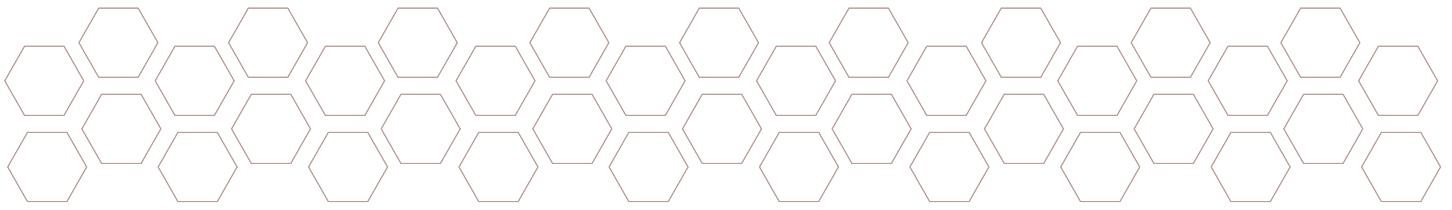
Lessons by Catriona Gordon | Design by Lisa Rilkoff



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UNIT 2

SEED TRAVEL & SEED SAVING

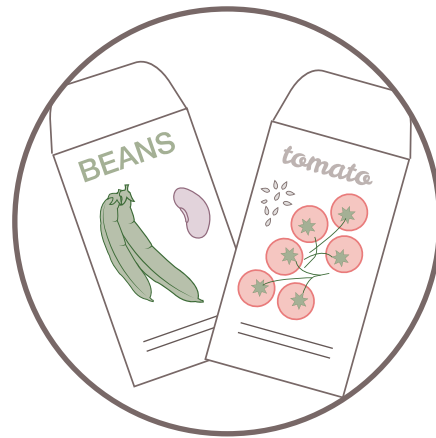
IN THIS UNIT:



4 How Seeds Travel

Explore different **seed dispersal methods**, including water, wind, gravity, ejection and animal dispersal (including human). Investigate **seed adaptations** to ensure dispersal. Learn **why** seeds need to travel.

» *pages 37 to 41*



5 Seed Saving

Learn **how to save seeds** and **why** it is important. Learn **where** seeds are found on a plant and **when** they are best collected. Explore **seed diversity**. Design and create your own **seed package**.

» *pages 42 to 49*

How Seeds Travel

Grade K to 4
Science
1 hour and 30 min



information
for the
teacher

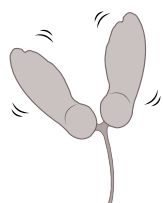


Photo Credit: "Dandelion wish (88/365)" by John Liu (LifeSupercharger on flickr), used under Creative Commons license 2.0 (CC-BY-2.0).

Seeds are the reproductive structure in seed plants, containing a plant embryo. When ripe, seeds travel away from the parent plant in order to establish new colonies and avoid competition for sunlight, nutrients, water, and physical space. Seed dispersal has allowed plants to colonize new habitats and increase species survival.

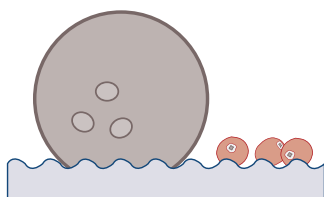
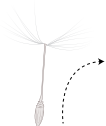
How do seeds travel? Seeds have evolved different methods of dispersal including: wind, water, animal carriers, ejection, and gravity. Seeds such as dandelions and maples have specific adaptations, such as wings and parachutes, which allow them to float through the air. Coconuts are round and have hard seed coats. This allows them to roll down a beach, into the sea and then float on ocean currents for extended periods before they are deposited on new beaches by wave and tide action. Many seeds are found in fruits that are tasty to birds and other animals. Fruits are eaten, and the non-digestible seeds pass through the gut of the animal. Seeds are then deposited in new places in the excrement of animals (which provide free fertilizer for the seed). Other seeds have evolved barbs, or hooks, which attach to animals' fur and can be transported long distances as hitchhikers. Other animals transport seeds and bury them for later consumption, such as acorns and squirrels. Many acorns are forgotten by the squirrels, and are left to germinate. Other seeds, sometimes called "poppers," use ejection or explosive methods to disperse their seeds. Geraniums have pods, which explode open when ripe, ejecting the seeds into the air. Gravity also helps to disperse seeds. Chestnuts, which are heavy and round, fall from the parent tree and roll away, giving the seed a chance to grow a distance from the parent plant. Lastly, one cannot forget the hand of humans in seed dispersal. For thousands of years, humans have collected seeds, traded them, and moved them from one area, country or continent to another, spreading plant species over thousands of kilometers.

TYPES OF SEED DISPERSAL & EXAMPLES OF SEEDS:



wind

eg. maple and dandelion seeds



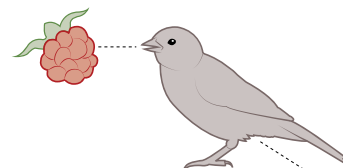
water

eg. coconuts and cranberry seeds



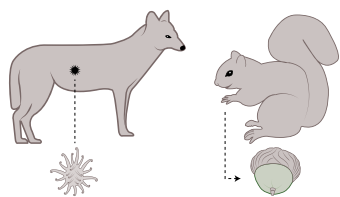
ejection (poppers)

eg. geranium, lupine, and kale seeds



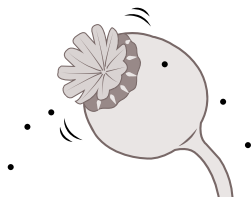
animal droppings

eg. berry seeds



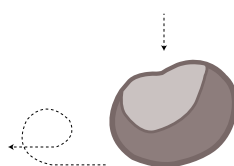
animal carriers

eg. burrs and acorns



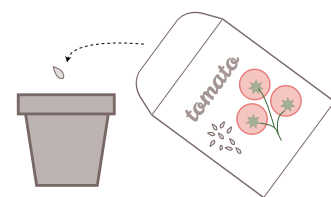
shakers

eg. poppy seeds



drop and roll

eg. horse chestnuts



humans

eg. seeds in seed packages

vocab

Seed Small embryonic plant covered by a seed coat. Means of reproduction in seed plants.

Seed Dispersal The movement or transport of seeds away from the parent plant

Fruit Plant structure that contains the seeds. In flowering plants it is the part of the flower, called the ovary.

Adaptations A trait which helps an organism survive

How Do These Seeds Move?

Explore different seed dispersal methods and adaptations, and learn why seeds need to travel.



MATERIALS

- Collected seeds and fruits with different seed dispersal mechanisms such as:
 - » Lupines, day lilies, broom, geraniums, kale, mustard, and / or radish (ejection)
 - » Poppies (shakers)
 - » Coconut, cranberries, and/or pussy willows (water)
 - » Dandelion, maple, thistle, and/or cottonwood (wind)
 - » Horse chestnuts (conkers) (gravity; drop and roll)
 - » Berries (animal droppings)
 - » Burdock (burrs), geums, and/or acorns (animal carriers)
 - » Seed package with seeds (humans)
- Magnifying glasses or loupes
- Trays to hold a variety of seeds

- Containers of water to hold floating seeds
- Wool socks (to check whether seeds can be carried by animals)
- “How Seeds Travel” activity sheet, one per student

PREPARATION

- Before the lesson, prepare several trays with a variety of seeds with different dispersal methods (one tray for each group)
- Prior to the lesson, classes can go on a seed hunt in a naturalized area, schoolyard or garden to look for seeds with different dispersal mechanisms and bring them back to the classroom.

NOTE

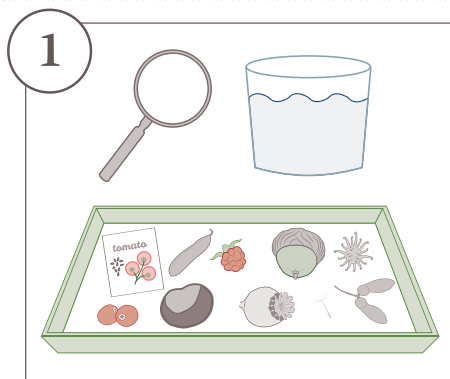
This lesson is best done in the **fall** when seeds are abundant.

Introductory Discussion

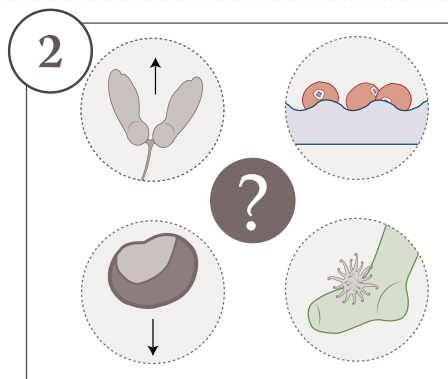
- » How do seeds move from one place to another?
- » Why do you think they need to move? (to avoid competition for resources and to establish new colonies).
- » Can you think of how they might be able to move away from their parent plant?

LESSON

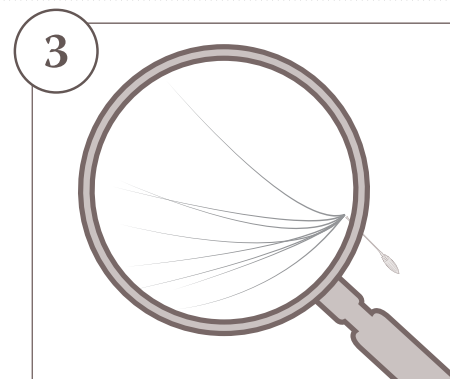
- » Have you ever seen seeds moving? How do they move?
- » Do animals help to move seeds? How? Are there other ways seeds can travel?
- » Do seeds have any parts of them that help them travel? These are called adaptations.
- » Have humans helped to disperse seeds? How?
- » Discuss different categories for seed dispersal: Wind, water, ejection, shakers, gravity (drop and roll), animal carriers, hitchhikers, and humans.



1. Hand out seed trays. Work in pairs or small groups. Give each group: a tray with a variety of seeds on it, a container filled with water, and a magnifying glass or loupe.



2. Discover seed dispersal methods. Let students explore all the seeds on their tray, throwing them up in the air, to see if they can float or fly, or putting them in water (are they boaters?) or dropping them on the floor (do they roll?). Students can try to stick seeds to wool socks, sweaters, or fleece to see if they can be carried by animals. Allow students to categorize all the seeds on their tray, based on the method of seed dispersal.



3. Identify seed adaptations. Using magnifying glasses if needed, ask students to look for adaptations of each seed, which help to let that seed travel (eg. Parachute on dandelion seed, wings on maple seed, tasty fruit of raspberry seed, burrs* or prickles on burdock). Using the activity sheet, allow students to draw and label each seed, showing the seed's dispersal adaptations. Very young students can tape seeds to their sheets.

*A Swiss engineer was interested in why burrs stuck to his clothing and his dog's fur. He looked at the burr under a microscope and found tiny hooks. This inspired him to create Velcro, which imitates the burr's hooks.

Closure Discussion

- » What was your favourite method of seed dispersal?
- » Can you name some adaptations that seeds have to allow them to travel?
- » Why do seeds need to travel?
- » Have you ever helped a seed to travel (think about a garden, or planting seeds in a classroom)?

SEED ADAPTATIONS

an explanation guide

WIND

Dandelion, thistle, and cottonwood seeds have fluffy “parachutes” that help seeds to float. Maple seeds have “helicopters” that spin seeds away from the tree.

SHAKERS

Shakers develop small holes in their seed heads as they dry and the seeds ripen - the ripe seeds can escape from the holes when it is windy.

DROP AND ROLL

Horse chestnuts have a spiky shell that helps them survive the fall from a tree and breaks open when it hits the ground. The roundness of the seeds and the impact from the fall helps the chestnuts roll away from the tree.

ANIMAL DROPPINGS

The taste of berries and fruit is delicious to animals. Also, animals are attracted to the colour of the fruit.

WATER

Coconuts and cranberries both contain pockets of air inside which help them to float.

EXPLOSION

Seed pods have seams that pop open when dried by the sun and jostled by the wind.

ANIMAL CARRIERS

Burrs and geums have small hooks that attach to animal fur. Acorns are big, bulky food for squirrels, so they often have to be dropped or hidden as a squirrel travels.

HUMANS

People use seeds to grow vegetables and flowers in their gardens for food and beauty. Farmers need seeds to grow and sell crops.

references & resources

BOOKS

Aston, Dianna Hutts. 2007. *A Seed is Sleepy*. Chronicle Books, San Francisco.

Carle, Eric. 1987. *The Tiny Seed*. Picture Book Studio, Natick MA.

Lawrence, Ellen. 2013. *From Bird Poop to Wind: How Seeds Get Around*. Bearport Publishers, New York.

Pallotta, Jerry. 2010. *Who Will Plant a Tree?* Sleeping Bear Press, Ann Arbor.

Richards, Jean. 2002. *A Fruit is a Suitcase for Seeds*. Millbrook Press. Brookfield Conn.

ONLINE

- **How Do Seeds Travel** YouTube video for K or grade 1:
<http://www.youtube.com/watch?v=6hcjxaBz8mw>
- **How Do Seeds Travel** slide show (2008) by Sarah Green, San Diego State University:
<http://www.slideshare.net/belleminjuan/how-seeds-travel>
- **Seed Dispersal Mechanisms:**
http://www2.bgfl.org/bgfl2/custom/resources_ftp/client_ftp/ks2/science/plants_pt2/dispersal.htm

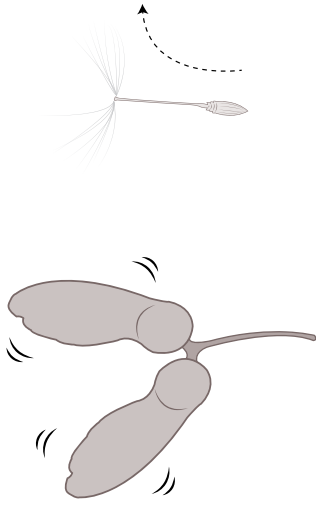
extensions

- Go for a seed/fruit hunt in the neighbourhood or school yard. This is best done in the fall.
- Book a field trip to **Van Dusen Gardens**. Seed Secrets K-Grade 3 offered from Oct-Nov:
<http://vancouver.ca/vandusen/childrenFamilies/schoolPrograms.htm>
- Book a field trip to **UBC Botanical Gardens**: <http://www.botanicalgarden.ubc.ca/school-groups>
- Take a guided walk through a Metro Vancouver regional park. The topic of seeds can be requested as part of the tour:
<http://www.metrovancouver.org/region/teachers/fieldtrips/RegionalParksFieldtrips/Pages/default.aspx>

credits

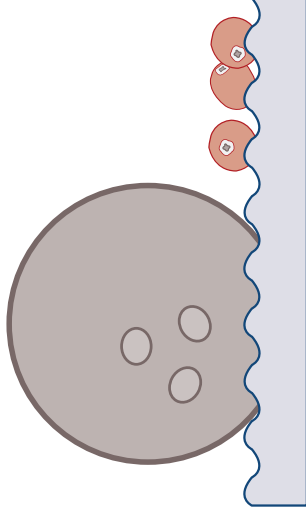
Lesson developed and written by Catriona Gordon. Design by Lisa Rilkoﬀ.

Types of Seed Dispersal



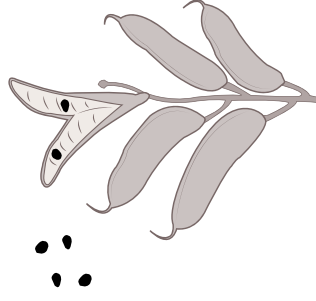
wind

eg. maple and dandelion seeds



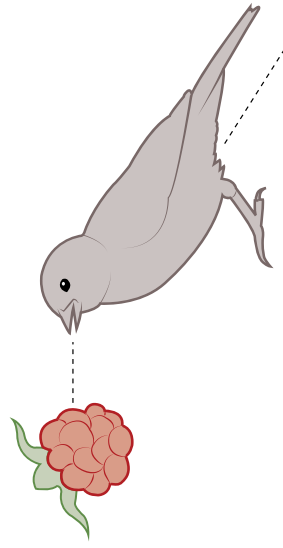
water

eg. coconuts and cranberry seeds



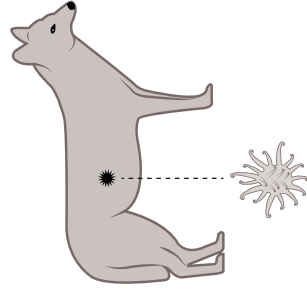
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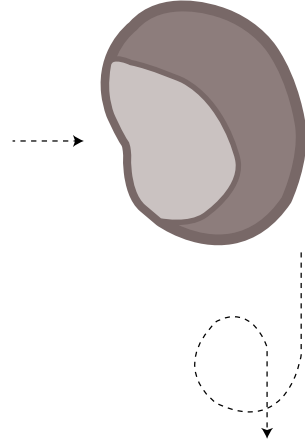
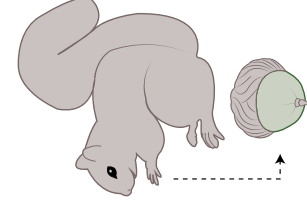
animal droppings

eg. berry seeds



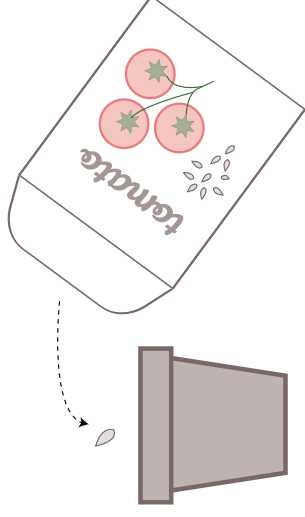
animal carriers

eg. burrs and acorns



drop and roll

eg. horse chestnuts

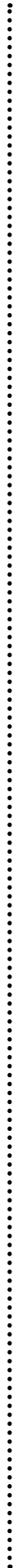


humans

eg. seeds in seed packages

How Seeds Travel

name: _____



Draw a seed in each box of the chart. Label the part of the seed that helps it to travel.

wind	water	explosion	animal droppings
animal carriers	shakers	drop and roll	humans