



Spreading Seeds (3-7)

Zoo Wild Pack Preparation Activity

At a glance

Students examine seeds that disperse by different means then create and test their own seed design.

Time requirement

One session of 60 minutes

Grades

Group size: 10-30

Grades: 3 to 7

Materials

Variety of seeds (i.e. dandelion, coconut, bladder nut, maple, acorn, sunflower, cocklebur, watermelon, apple, pea pod)

Magnifying glasses

Fan

Bucket of water

Stuffed animal or towel

Scissors

Glue or tape

Paper clips, stapler, & staples

Assorted craft materials (i.e. papers, cardboard, cotton balls, fabric, popsicle sticks, rubber bands)

Goals

1. To gain background knowledge on seed dispersal
2. To practice inquiry skills

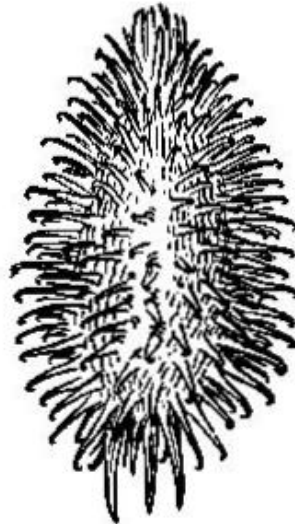
Objectives

1. Students will be able to explain the importance of seed dispersal
2. Students will be able to describe several ways that plants spread their seeds

3. Students will be able to describe how specific seed designs aid in their dispersal
4. Students will be able to conduct an investigation.

Theme

Seeds are specially designed for dispersal.



Academic standards - Science

Ohio Science Academic Content Standards	Life Science <ul style="list-style-type: none"> • Diversity and Interdependence (4:3) • Evolutionary Theory (7:8) (8:3) Scientific Inquiry <ul style="list-style-type: none"> • Doing Scientific Inquiry (3:2) (5:2,3) (6:1) Scientific Ways of Knowing <ul style="list-style-type: none"> • Nature of Science (5:1)
Kentucky Core Content— Science	Physical Science <ul style="list-style-type: none"> • Motion and Force SC -(04-1.2.1) (05-1.2.1) (06-1.2.1) (07-1.2.1) (08-1.2.1) Biological Science <ul style="list-style-type: none"> • SC - (EP-3.4.3) (04-3.4.1) Biological Change <ul style="list-style-type: none"> • SC - (05-3.5.1)
Indiana Science Standards	1. The Nature of Science and Technology <ul style="list-style-type: none"> • Scientific View of the World (4.1.1) (6.1.2) • Scientific Inquiry (3.1.2, 3.1.4, 3.1.5) (4.1.2, 4.1.3) (7.1.2) 2. Scientific Thinking <ul style="list-style-type: none"> • Critical Response Skills (8.2.9) 3. The Physical Setting <ul style="list-style-type: none"> • Scientific Enterprise ((5.1.3) • Forces of Nature (5.3.11) 4. Living Environment <ul style="list-style-type: none"> • Diversity of Life (3.4.1) (6.4.3) • Interdependence of Life and Evolution (4.4.5) (5.4.7)

Background

If a seed lands too close to its parent tree, it may struggle to get enough sunlight, moisture, and nutrients to grow. Therefore, plants have developed many different ways to spread their seeds to other places.

Some seeds are carried away by wind, water, or animals. Others, like peas, are launched by the plant itself as a seedpod bursts open (propulsion). Special adaptive features are designed to aid in seed dispersal, such as wings, hairs, and burrs. Seeds that are spread through animal droppings are encased in fleshy fruits that appeal to hungry critters from birds to monkeys to elephants. Others, such as acorns, are “planted” by squirrels that bury them and forget to dig them up.

Large dipterocarp trees that grow in rainforests have two-winged seeds that spin in the air like a mini-helicopter. The wings slow down the seed’s

fall and allow the wind to carry it far away. **Dipterocarp** trees are tall hardwood trees that mostly grow in Southeast Asian tropical rainforests. The name dipterocarp comes from the Greek words for two-winged fruit. Every few years the trees produce and drop huge loads of seeds, called masting. Seeds that do not grow into new trees are eagerly eaten up by bats, squirrels, and other animals. The wood from dipterocarp trees is used to build houses and make furniture. It is important to harvest the trees in a careful way that does not damage the forest. Like a dipterocarp tree, the maple trees in our backyards also have winged seeds. However, a maple seed has just one wing instead of two.



Vocabulary

Burr—Seed or fruit bearing hooks or teeth that attach to fur or clothing like Velcro

Fruit—Protective seed covering

Seed—Plant embryo that develops into a new plant

Seed dispersal—Scattering or distribution of seeds



Activity

Getting ready

Collect materials needed for activity, which includes various types of seeds that represent as many different means of dispersal as possible.

Doing the activity

Let the students know that they will visit the Zoo soon and conduct an investigation on how plants spread their seeds.

Discuss why plants need to spread their seeds. Since plants are rooted in the ground, they have developed different ways to scatter their seeds. Ask the students to describe examples of some of the ways they know seeds travel.

Investigating Seeds

Question & Observe - Have the students examine the different types of seeds you gathered and hypothesize how each one travels based on its physical features such as shape and texture. Magnifying glasses may provide a closer look. Test their predictions.

- Drop each seed in front of a fan. Does it blow or fall?
- Place a seed on a stuffed animal or towel. Does it stick?
- Drop the seed in water. Does it float?

What do the wind-dispersed seeds have in common? How do they compare to those that hitch a ride on animals? What other comparisons can you make?

Seed Design Contest

What is the best design for a seed to ride on the wind? Let's have a contest to see who can design the seed that travels the farthest distance.

As a class, decide how the seeds will be dropped and from how high. Will they be dropped in front of a fan? How will they measure the distance traveled? Will each seed be dropped just once or will they calculate an average distance over several drops? Be sure to choose a large, open area.

Once the parameters have been set, let the students design and construct their seeds, either in pairs or small groups. Provide a variety of materials and tools for them to use. Also, encourage them to come up with their own materials.

Once the seeds are constructed, test them out. Keep record of how far each one traveled. Discuss why they think certain designs worked better than others. Relate their ideas to what they know about the aerodynamics of planes, gliders, helicopters, Frisbees, flying insects and birds, and more. For background information, consult NASA's Beginner's Guide to Aerodynamics at www.grc.nasa.gov/WWW/k-12/airplane/bga.html.



Wrap-up

The birds and the bees were flying through the air way before we ever figured it out. Many of our human inventions were first inspired by nature (including Velcro from burrs). What other nature-inspired inventions do they know about? Will we miss out on opportunities for new inventions if we continue to separate ourselves from the larger natural world?

Assessment

Have students write up the results of the seed design contest, including a discussion of which design elements were most important.

Unsatisfactory—Did not complete report and/or report did not fully explain the results and discussion.

Satisfactory—Report presented results along with a basic discussion.

Excellent—Report presented results along with a thoughtful discussion.



Resources

Macken, JoAnn Early. [Flip, Float, Fly!: Seeds on the Move](#). 2008.

Overbeck, Cynthia. [How Seeds Travel](#). 1990.

Pascoe, Elaine. [Seeds Travel \(How and Why\)](#). 1990.

Further investigations and readings related to Wild Pack topics are supported at www.WildResearch.org

