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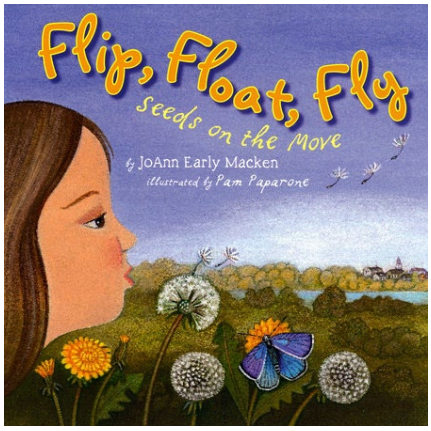
July 2022 Book of the Month

Flip, Float, Fly

Seeds on the Move

By: JoAnn Early Macken

Big trees and tiny flowers all start as the same thing: a seed. To reproduce, plants have to spread their seeds to new places. See how different plants have different ways to disperse their seeds in this book.



Did You Know? (Ag Facts)

1. The average strawberry has 200 seeds.
2. Even if a seed is planted upside down, the seedling always grows right-way up.
3. Seeds can be used as oils, spices, fabric dye and jewelry

Discussion Questions

1. Have you ever planted a seed? Did the seed sprout in a different location?
2. What do seeds need to grow?

Grade Level(s):

·Kindergarten – Second Grade

Reading Levels

·Lexile Level 650L

·Fountas and Pinnell M

Estimated Time:

·20 minutes

Purpose:

·Students will understand how seeds move and travel to new places to form new plants.

Vocabulary:

·**Seed**- the reproductive part of a plant.

·**Reproduce**- to make more

·**Seedpod**- a carpel or pistil enclosing the seeds of a plant

·**Fruit**- the part of a flowering plant that contains the seeds

·**Shoot**- the part of a plant that comes up above the ground when it is just beginning to grow, or a new part that grows on an existing plant

·**Sprout**-small growth on a plant

·**Seedling**- a young plant grown from a seed

·**Roots**- part of the plant that helps to anchor the plant to the ground, so it does not fall over. It absorbs water and nutrients from the soil and sends them to the stem.

·**Stem**-part of the plant that supports the plant and grows up towards the light. Stem acts like the plant's transportation system

·**Leaves**- the leaves are usually green, and the leaf is known as a plant food factory because it prepares food for the entire plant through the process of photosynthesis.

·**Flower**- It makes seeds, which become new plants.

·**Seed dispersal** - the way seeds get away from the parent plant to a new place

Citation

Facts for kids. Kids encyclopedia facts. (n.d.). Retrieved June 14, 2022, from https://kids.kiddle.co/

Background Agricultural Connections:

Seeds are vital to our survival. Without seeds, the plants that provide our food, fuel, fiber, oxygen, and many other essential products would not exist. Seeds are the method by which some plants reproduce. Each seed has a seed coat, an embryo, or a baby plant, and a food source in the form of either an endosperm or cotyledons.

In order for a seed to germinate or sprout, it needs warmth, moisture, and air. Seeds remain dormant and will not germinate until the proper conditions are present. For example, in some climates, the winter soil temperature may dip to below 32°F. Seeds will not sprout in these conditions. Once the ground thaws in the spring and the temperature rise to approximately 65°F, most seeds

will sprout if moisture and air are also available. Most seeds germinate when the temperature is between 65-85°F.

In the germination process, moisture softens the seed's outer protective covering, called the seed coat. The embryo pushes through the softened seed coat and the new plant begins to grow. The roots push further down into the soil and a shoot, which contains the new plant's stems and leaves, pushes up towards the surface.

The germination process can be somewhat mysterious because it typically occurs underground where it cannot be observed. The clear plastic glove and cotton balls used in this activity provide an opportunity to view the germination process and the plant's beginning growth and root system.

Learning about seeds and the germination process offers a wide variety of opportunities for scientific investigations and experiments. Working with moisture, light, air, and temperature as variables, students can design experiments to discover optimal conditions for germination.

Citation

Knott, S., Spielmaker, D., & Wallin, L. (n.d.). *Farming in a Glove*. Matrix lesson. Retrieved June 14, 2022, from https://minnesota.agclassroom.org/matrix/lesson/293/

Materials:

- Flip, Float, Fly: Seeds on the Move
- Sunflower seeds
- Small bin (Rubbermaid shoe box)
- Paper Fans
- Small paper cup
- Sock
- Water
- Other items to move seeds

Interest Approach – Engagement:

The teacher will have a small plant for the students to use to make predictions about how the plant was able to grow there. Students can share their ideas. The teacher will discuss seed dispersal, and how plants move to new places.

Procedures:

1. Introduce the book with a picture walk asking students what they know or see in each picture.
2. Ask the students to think as you read to find out how seeds travel and grow.
3. Use the following questions as you read:
   a. Do you know what a dandelion is? How does its seed travel?
   b. Do you know what a tumbleweed is? How does its seed travel?
   c. Have you ever seen a locust tree pod? How does its seed travel?

d. What is the hummingbird doing? How is it helping the seed travel?

e. What are the bats doing? Can they help a seed travel?

4. Refer to the purpose. Ask the students to name the different ways the seeds traveled in the book.

5. The teacher will pair the students and provide them with the following materials:

- Workspace
- Small bin
- A small cup of sunflower seeds
- Paper fan
- Sock
- A small cup of water

The teacher will challenge the students to move the seeds from one side of their bin to the other using the different items to show how seeds travel.

After the experiment, the teacher will allow the students time to show how they were able to move their seeds.

Assessment:

Students will be able to orally recall the ways that seeds can travel.

Enriching Activities:

1. Make a Whirlybird

Materials

· Computer with access to a printer to print the whirlybird template (found at the end of the document)

· Printer paper

· Scissors

· Several paper clips

· Stopwatch (optional)

· A safe, high place from which to drop the whirlybirds (You could have an adult stand on a chair or stepping stool, for example.)

Preparation

· Download and print the whirlybird template from this pdf. If you do not have access to a printer, you can download the file and open it on your computer, then use a pencil and ruler to draw the whirlybird shape on a piece of paper, based on the dimensions in the template.

· Follow the directions on the template to cut out and fold your whirlybird.

Procedure

· Now it's time to drop your whirlybird! What do you think will happen when it gets dropped? Have an adult help drop it

from a safe high place (such as standing on a chair or a stepping stool). How did the whirlybird fall?

· Now drop the whirlybird a couple more times—in the same fashion, from the same height. Why do you think it is important to drop it more than once?

· Now, attach a paper clip to the bottom part of the whirlybird and drop it again. Do you think it will fall faster? Pay close attention. How did it fall with a paper clip attached?

· Keep adding paper clips, one at a time, to your whirlybird and drop it after each new paper clip. What do you observe as you add more and more paper clips?

· You can also use a stopwatch to time how long it takes the whirlybird to fall with different numbers of paper clips on it. Write down the times to help you remember how fast it falls when you add different numbers of paper clips. Do you detect a pattern?

Citation

Buddies, S. (2015, July 9). Make a whirlybird from paper. Scientific American. Retrieved June 14, 2022, from https://www.scientificamerican.com/article/make-a-whirlybird-from-paper/

2. Gone with the Wind

Materials

· Examples of different seeds that are dispersed by the wind. Depending on where you live, you may be able to find some of these seeds outside. If you have access to a computer, you can also do a web search for maple seeds, dandelion seeds, and other types of seeds to help get ideas.

· Small, uniform, lightweight objects that you can use as "seeds." For example, you could use small paper clips or thumbtacks; or purchase a bag of real seeds (like sunflower seeds) at the supermarket.

· Craft supplies to build dispersal mechanisms for your seeds. These could be as simple as paper and tape, but you could also use things like streamers, cotton balls, or even things you find outside, like blades of grass.

· Scissors, tape, and glue for cutting and attaching your craft supplies to your seeds

· A window fan or large box fan.

Preparation

1. Clear an open area in the room where you will do the experiment. Place the fan on a table or chair, aimed across the room. You can also do the experiment outside on a windy day.

Instructions

1. Design and build several dispersal mechanisms for your seeds. You can use your imagination and come up with your own ideas, but here are a few to get you started (using a paperclip as an example "seed"):
    - Attach a paperclip to a small, square piece of paper, about the size of a sticky note, without making any changes to the paper
    - Attach a paper clip to another small piece of paper, but make a bunch of parallel cuts in one side of the paper to give it "frills," and bend them outward
    - Attach a paperclip to a cotton ball
    - Attach a paperclip to a cotton ball that you have pulled onto expand it a bit and make it wispier
    - Cut out some paper in the shape of a maple seed and attach a paper clip
2. Turn on the fan. One at a time, try dropping your seeds in front of the fan. Also try dropping a plain seed (e.g. a regular paper clip with nothing attached) to see what happens. How far forward do the seeds get blown by the fan? Do certain seeds take longer to reach the ground than others?
3. Think about your results. Did some of your designs not work at all (fall straight down, without blowing forward)? Did some work better than others? What can you do to improve your designs? Can you make changes to your seeds to make them blow even farther?

Citation

Finio, B. (n.d.). Gone with the wind: Plant seed dispersal: Stem activity. Science Buddies. Retrieved June 14, 2022, from https://www.sciencebuddies.org/stem-activities/gone-with-the-wind-plant-seed-dispersal

3. How many seeds do different types of fruit produce?

Materials

· Different types of fruits: Try to include a pepper, tomato and apple as well as a squash or cucumber (yes, all of these are technically considered the "fruits" of their plants)

· Knife

· Cutting board

· Paper towels

Preparation

1. Go to the grocery store and pick out different kinds of fruit. Don't just stick to traditional fruits, try some new ones as well. Some produce you might think are vegetables are really fruit! Try to include at least one pepper, tomato and apple, along with a squash or cucumber. Avoid seedless varieties.

2. **Tip**: Bananas do have seeds, but they are very tiny, appearing as little black spots in the center of a banana slice. You can try to count them, but it is not recommended!

3. **Tip**: If you dissect a pepper, be sure to wash your hands before you touch your eyes after handling the seeds. Pepper seeds can be spicy and cause a burning sensation! Use a mild pepper variety, such as a bell pepper, if you are very sensitive.

4. You may need an adult to help you when cutting the fruit open.

Instructions

1. Begin to dissect your first fruit, removing the seeds and placing them on a paper towel. In the fruit, are the seeds arranged in a certain pattern?

2. When you are done removing the seeds, count the number of seeds on the paper towel. How many seeds were in the fruit?

3. **Tip**: If you are dissecting a cucumber or squash, instead of removing the seeds you can try cutting the fruit lengthwise, counting the rows of seeds, and then slicing the fruit the other way to determine how many seeds are in one row. Multiply these two numbers together to get a good approximation of the total number of seeds.

4. One at a time, continue to dissect each fruit, place the seeds on a paper towel, then count them. Be sure to keep the seeds from different fruits separated.

5. How many seeds are in each fruit? Which held the most seeds? The least? Did similar types of fruit produce similar numbers of seeds?

6. How do seeds from different types of fruit look similar or different? In each fruit, were there similar patterns in which the seeds were arranged

Citation

Teisha Rowland. (n.d.). *How many seeds do different types of fruit produce?: Stem activity*. Science Buddies. Retrieved June 14, 2022, from https://www.sciencebuddies.org/stem-activities/how-many-seeds-do-different-types-of-fruit-produce

Companion Lessons

- Edible Plant Game
- A Weed Is a Flower: The Life of George Washington Carver

· The Fruits We Eat
· The Tree Farmer
· Jr. Sprout - Healthy Eating
· Farm to Table & Beyond

Sources/Credits:

1. “Definition Facts for Kids.” Wikt:Description, https://kids.kiddle.co/Definition.

2. Sue Knott, Administrator and Yasuko Mitsuoka Grow. Matrix Lesson, https://minnesota.agclassroom.org/matrix/lesson/66/.

3. Buddies, S. (2015, July 9). Make a whirlybird from paper. Scientific American. Retrieved June 13, 2022, from https://www.scientificamerican.com/article/make-a-whirlybird-frompaper/

4. Gone with the wind: Plant seed dispersal: Stem activity. Science Buddies. (n.d.). Retrieved June 13, 2022, from https://www.sciencebuddies.org/stem-activities/gone-with-the-wind-plant-seed-dispersal

5. How Many Seeds Do Different Types of Fruit Produce? Stem activity. Science Buddies. (n.d.). Retrieved June 13, 2022, from https://www.sciencebuddies.org/stem-activities/gone-with-the-wind-plant-seed-dispersal

Suggested SC Standards Met:

ENGLISH/ LANGUAGE ARTS

K.I.1.1 Engage in daily opportunities for play and exploration to foster a sense of curiosity, develop the disposition of inquisitiveness and begin to verbally articulate “I wonders” about ideas of interest.

KRL..5.1 With guidance and support, ask and answer who, what, when, where, why, and how questions about a text; refer to key details to make inferences and draw conclusions in texts heard or read.

KRL..5.2 With guidance and support, ask and answer questions to make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.

KRL..6.1 Describe the relationship between illustrations and the text.

K.RL.9.2 With guidance and support, identify how an author’s choice of words, phrases, conventions, and illustrations suggest feelings, appeal to the senses, and contribute to meaning.
K.RL.11.1 Identify the author and illustrator and define the role of each.

1.RL. 5.1 Ask and answer who, what, when, where, why, and how questions to demonstrate understanding of a text; use key details to make inferences and draw conclusions in texts heard or read.

1.RL. 5.2 Make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.

1.RL.9.1 Identify the literary devices of rhythm, repetitive language, and simile
and sound devices of rhyme, onomatopoeia, and alliteration; explain how
the author uses each.

1.RL.9.2 Identify how an author's choice of words, phrases, conventions, and
illustrations suggest feelings, appeal to the senses, and contribute to meaning.

1.RL 11.1 Identify the author's purpose—to explain, entertain, inform, or
convince.

2.I 1.1 Ask self-generated questions that lead to group conversations,
explorations, and investigations.

2.RL. 5.1 Ask and answer literal and inferential questions to demonstrate understanding of a text; use specific details to make inferences and draw conclusions in texts heard or read.
2.RL.5.2 Make predictions before and during reading; confirm or modify thinking.

2.RL 6.1 Use information gained from illustrations and words in a print or
multimedia text to demonstrate understanding of its characters, setting, or plot.

SCIENCE

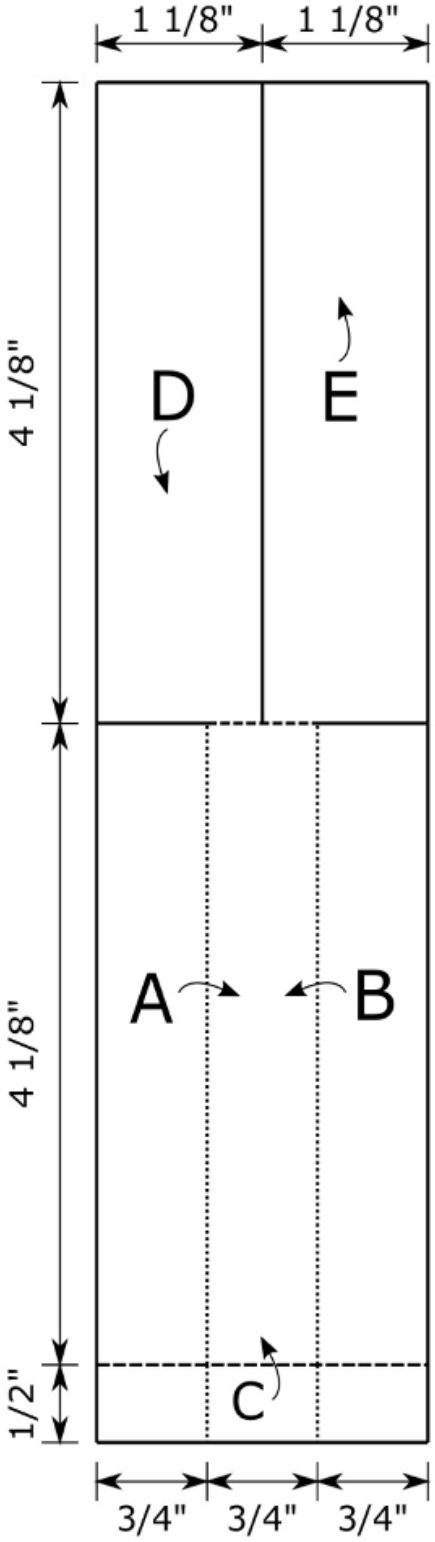
K.L.2: The student will demonstrate an understanding of organisms found in the environment and how these organisms depend on the environment to meet those needs.
K.L.2A. Conceptual Understanding: The environment consists of many types of organisms including plants, animals, and fungi. Organisms depend on the land, water, and air to live and grow. Plants need water and light to make their own food. Fungi and animals cannot make their own food and get energy from other sources. Animals (including humans) use different body parts to obtain food and other resources needed to grow and survive. Organisms live in areas where their needs for air, water, nutrients, and shelter are met.

K.L.2A.6 Obtain and communicate information about the needs of organisms to explain why they live in particular areas.

1.L.5A.1 Obtain and communicate information to construct explanations for how different plant structures (including roots, stems, leaves, flowers, fruits, and seeds) help plants survive, grow, and produce more plants.

1.L.5A.2 Construct explanations of the stages of development of a flowering plant as it grows from a seed using observations and measurements.

Science Buddies "Whirly Bird" Template

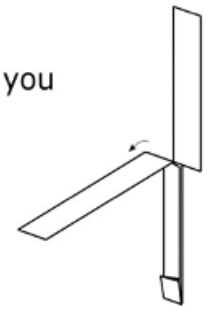


1. Cut along the solid lines

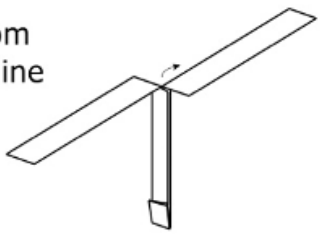
2. Fold parts A and B inward along the dashed lines

3. Fold part C upward to create a tab that holds parts A and B in place

4. Fold part D toward you along the dashed line



5. Fold part E away from you along the dashed line



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