

Maple Seed Math



Duration: 60 minutes

Grade Level: 1st-4th

Location: In class: Intro & Conclusion

Outside: Seed Dispersal Activity

How-to video: [Maple Seed Math Experiment](#)

Recommended Resources:

- *Presentation:* [Google Slides](#) or [pdf](#)
- [From Seed to Plant by Gail Gibbons](#)
- *Seed Dispersal Methods and Types Videos*
 - [Simple song](#)
 - [Detailed explanation](#)

Materials:

- Object such as a rock, stick, or bandana to mark your starting point
- At least 1 maple seed per student or a paper & paper clip for making folded paper seeds (and instructions)
- Measuring tape or ruler (1 per student)
- Seed Dispersal Handout or blank sheet of paper or notebook
- Writing utensil
- Permanent marker

Theme: Seeds Are Made To Travel!

Goals: Students are introduced to a plant's life cycle; specifically what happens to the seeds once the plant dies back or transitions to the reproductive stage in its life cycle. Students will describe how seeds are dispersed and identify which seeds use which method of travel. Students will then predict what factors will influence the distance their seeds will travel away from the center point. Finally, students will measure and record data to find the average distance of travel for all the seeds they test.

Lesson Prep: Before the lesson either collect enough maple seeds for each student to have at least one and distribute to your students, or give them access to the seed paper templates (see attached document below) to make their own.

NOTE: You can share the [powerpoint](#) with students at this time. Powerpoint will include introduction, activity instructions, reflection questions and conclusion.

Introduction (20 mins): *Read a favorite book about seeds - see recommended resources above.*

Work with the student's or group's existing knowledge and what you read in the book to define the stages of life for plants and animals as a "life cycle". Have a class discussion about seed dispersal – "What does it

mean for seeds to disperse?” “Why is it important that seeds are able to disperse?” “During what time of year do seeds disperse?” “What physical factors help the seeds disperse?” “What types of seeds need what type of dispersal method?”

Four types of seed dispersal: See attached document for the ways seeds travel!

Seeds with wings: Some seeds have parachutes or wings that allow them to slow down as they fall from the mother plant. These seeds are carried away from the mother plant by the wind.

Hitchhikers: Have you ever gotten home from a field trip or a hike and your socks are covered with sticky or prickly seeds? Some seeds have the ability to stick to clothing or animal fur and be dispersed..

Going with the flow: The seeds of some plants that live in the water, or close to it, can float!

Help from animals: Some seeds have to be eaten by animals and deposited in their droppings to get to their new homes.

Transition into the activity, asking: “Can anyone think of a plant in our school yard, neighborhood, or nearby park, that is dispersing its seeds right now?” “What method of seed dispersal are these seeds using?”

Activity (25 mins):

How-to video: [Maple Seed Math Experiment](#)

Introduce students to the Maple Seed experiment. Ask the students to hypothesize how far their seeds will travel and write it down in their journal or on the handout. Explain that for the next 25 mins the outdoors will be the classroom. If you are using the paper seed model, have the students make the paper model before you send them outside. If you are not printing handouts you will also need to have them draw their data tables on a piece of paper or in a journal at this point (see handout below for table layout). Once the materials are ready, remind them to bring their data collection sheet or journal, a writing utensil, seeds or models, and to ask permission from an adult before heading outside. Tell them that once they get outside their job is to find a space away from others, if necessary, collect at least 1 maple seed from the ground, and pick a rock, stick, or anything that they can use to mark where their feet will stand during the experiment. If you are in a group of students, have them mark each maple seed with a pen or marker (this is so at the end of the experiment they know which maple seeds are theirs). Describe what they will be doing outside before sending them outside or heading out together: “Each one of us will be acting like a tree today. We will stand with our feet planted in one spot (just like roots!) and throw our maple seed or paper model in the air as high as you can. Once the seed lands, measure the distance from the starting or center point to the seed after each throw, record distance on the data sheet, collect your seed or model

and move back to the center “trunk” spot to throw again (repeat ten times). Make sure to record each measurement on the data sheet! After the student is done, bring yourselves and your materials back inside or connect back to the class virtually and have them calculate the average their seeds have travelled.

Debrief and Inquiry Q's (5 mins):

Once every student has found the average distance their seeds have fallen, have them share their average with the group. Then work with them to find the classes average. You will want to have a discussion about the results.

1. What factors influenced how far your seeds travelled?
2. How did your final average compare to your original hypothesis?
3. Will every seed travel in the same way? Why or why not?
4. What was challenging about this experiment?
5. What did you enjoy about this experiment?
6. Do you think the seeds in this experiment travelled the same distance they would from a real tree? Why or why not?
7. What are some other types of seeds that you know and how might they be dispersed?

Conclusion (10-15 mins):

Every plant produces seeds, during their lifetime or once they have come to the end of their life cycle. Seeds ensure that more of that particular species will carry on, and many plants produce hundreds, even thousands, of seeds at once in hopes of just getting one additional plant to sprout. What are some other types of seeds that you know and how might they be dispersed? Next time you are outside try to find the seeds of other plants around you, try to identify how those seeds might be dispersed.

Standards Alignment:

Common Core:

MD.B.4 Measurement & Data: Students will Represent and Interpret data by creating and inputting data into a table, and then analyzing the data set for the average.

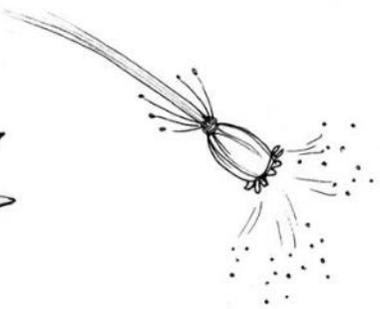
NGSS Disciplinary Core Ideas:

LS1.A Structure and Functions: Students will be introduced to plant structures and functions through learning about plant life cycles.

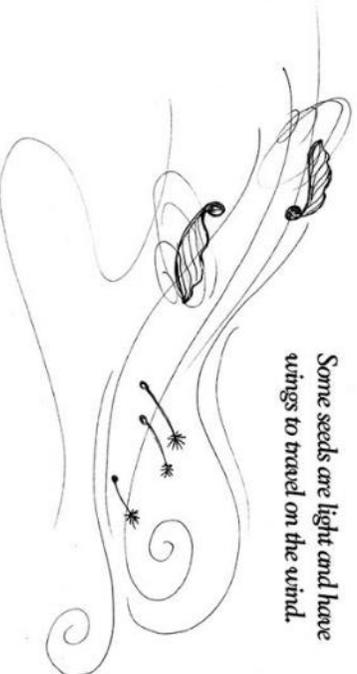
LS1.B Growth and Development of Organisms: Students will become familiar with the concept of plant reproduction through learning about seed dispersal methods and testing efficacy of one type of seed dispersal.

For seeds to grow, they need to travel to new places in the ground. Here are some ways that they travel:

Some plants explode and send their seeds flying into the air.



Some seeds are light and have wings to travel on the wind.



Some birds and animals can move seeds around and forget them in the ground.



Some seeds have little hooks on them so they stick to an animal's fur and travel to a new place.



Many seeds are eaten by animals and are planted in their droppings.



Some seeds are hollow inside so that they can float on the water until they find a new place to grow.

Heavy seeds fall down to the ground.



Name: _____

Date: _____

Lesson: _____



Experiment Instructions:

-Collect at least 1 maple seed from the ground and mark them with a marker, or make 1 paper model of a seed. (see instructions)

-Choose an object (stick, rock etc.) to mark your center point (where your feet will be placed for the duration of the experiment).

-One at a time, throw the maple seed in the air as high as you can. If you have only one seed, measure the distance from center (or “trunk”) after each toss.

-Once you have thrown your maple seed 10 times, and have recorded the distance of each toss in your data collection table calculate the average distance the seeds traveled.

| Maple Seed | Distance from center point (in) | Comments – factors that affected how seed travelled |
|------------|---------------------------------|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

Average:

Rotocopter Seed Pod - Page 1 of 2 (Seed model instructions provided by Mystery Science, mysteryscience.com)

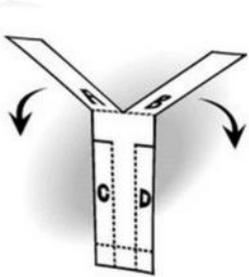
This seed pod spins through the air. It's a little bit like a maple seed.

Instructions:

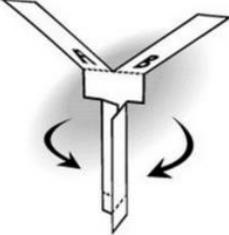
1. If you are in a group of people write your name on your Rotocopter. When your seed flies away, you'll want to be able to find it again.

2. Cut along the solid lines of your Rotocopter pattern (see page 2).

3. Fold on the dotted lines. Fold A toward you and fold B away from you:

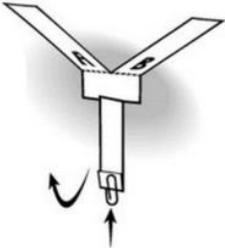


4. Fold C toward you. Then fold D on top of C:



5. Fold the bottom up and slide the paper clip
paper clip is the seed in this seed pod.

on: The



6. Now your Rotocopter is ready to fly. Hold it with the paper clip pointing down and drop it.

Rotocopter Seed Pod Template Page 2 of 2

- Trace and cut or print and cut

