

Seed Dispersal Lesson 4: Traveling by Water

Estimated Time - 2 days, 45 minutes/day

Description: Students watch a palm tree seed (coconut) floating and traveling by water. As a class, students test their seeds in a tub of water to see if it floats. On Day 2 students discuss what they think about the seeds traveling by water now and how the backyard and video locations are different (body of water vs. dry land except rainfall).

Objective: Students will support a claim about their seed with (1) features of their seed that do/don't allow it to travel by floating on water and (2) evidence from their test

Concepts/Subconcepts Addressed:

- What seed properties would be most helpful for a seed to travel via water.
- Floating may assist a seed to travel by water.

What Will Students Figure Out:

We think our seed can/cannot travel by water! We think so because we put the seed in water and what happened was...

Estimated Time: Two Days -- Day 1 45-60 min, Day 2 30 min.

Materials: • One large plastic bin with water (big enough that you can put it in the middle of a circle for children to view) • Popsicle stick or other stirring tool • Seeds • Investigation journals • Slides • Paper towels/clean up material	Set-Up and Preparation Notes: • Coconut Video (watch & check link) • Put up pictures of the seeds being tested and students' predictions; you will reference these throughout the different investigations • Create results chart [See picture below]
Additional Supports to Consider:: Word boxes and visuals on student sheet: use similar language and drawings as you talk.	



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Teacher Note: In this lesson, you are supporting students in a structured way to think about how to develop a test to **figure something out:** which seeds are good at floating and which are not—and therefore, which could travel by floating on water.

You will want to make sure students can see the results of the investigation so they can make claims about their seeds based on whether they float or sink. We have found that a document camera does NOT work well—you can't see where the seed is in the water. We suggest either (1) using a big basin of water and having students sit in a circle around it or (2) having students come in a group at a time to put their seed in, then publicly recording what their seed is doing (e.g. by taking a picture that you can then show on slides or by marking where there seed is on a public representation like a joint picture on the whiteboard (marking it on the top of the water, middle, or bottom).

After students test their ideas, you will engage them in making and supporting claims using a shared chart that allows them to connect the structure of the seeds with whether they are good at floating and traveling with water (this will be a repeated structure throughout these lessons). You will then ask them to extend their investigation to think about how likely it is that seeds are traveling by water near their school.

You can set the chart up so that one chart will record all of your results across tests or so that you have a separate chart for each kind of test, as below.

SEED	Water?	Wind?	Sticking to Animals?
 maple	? Float Wave knocked it under		
 Queen Anne's lace	? Floated as a single piece The clump was 1/2 under water		
 milkweed	Yes almost the whole seed was on top.		
 berry	it moved quickly in the waves 1/2 of the clump was under water		
Seed Travel Investigation			

SEED	TRAVELS BY FLOATING	OUR EVIDENCE + THINKING
 Maple	Y	pushed down and came back up white parts are helpful to keep it up
 Queen Anne's lace	Yes and No	the berry itself sinks but with the skin it floats it doesn't go all the way to the bottom going up and down
 Milkweed	Y	the white hairy part in the water the seed on top look light
 Berry	Yes and No	when there is a storm, it will sink the wings would help it float
 Maple	Yes	When you put it in it floated Does it pop back up?



Procedure and Facilitation Points:

Day 1

Make a connection to the anchoring phenomenon and students' progress: *Over the last few days, we collected seeds from different plants in our garden/yard. We've figured out that seeds can travel different ways: by wind, by sticking, being eaten by animals, or by water. You started working in your groups to look at one seed and think about how it might travel. (Here, reference the predictions chart, which should be kept visible throughout the investigations.)*

We didn't all think that our seeds would travel in the same ways. Highlight some differences students discussed and connect to features of the seeds they noticed.

Introduce Today's Investigation: *Today, we are going to look more closely at our seeds and figure out if our seeds travel by water. We're going to talk a little more about how seeds travel by water and then we will design our own investigation to see if our seeds can travel by water.*

First, let's look at this video of a coconut, which is a palm tree's seed. This is a seed that scientists have discovered is good at traveling by water. The coconut is able to travel by floating on ocean water!

While we are watching the video, think about how this seed travels to a new place and grows a new plant there and if our seeds could also travel by floating on water.

Play video **starting at 1:50 to about 3:14** (point out the palm tree plant in opening shot)

- Point out floating coconuts for students that can't find them
- Highlight the idea of the ocean being moving water

Ask questions about the video, such as:

- *What did you notice about how the coconut travels to a new place by water?*
- *Does it surprise you that a coconut can travel by water? Why or why not?*
- *What do you think happens after the coconut lands on the shore?*

Consider how to do an investigation: *Now I'm wondering which of our seeds could travel by water. How can we use this tub of water to test if our seeds can travel by floating on water?*

Highlight ideas related to:

- We're using the tub of water to be like the ocean.
- We can put seeds in and see if they float
- If students want to move the water using the stirrer to see if their seeds then move, that is fine too.



Discuss expectations for how you would like students to gather around or work with the tub of water.

If you think it will help your students, project the page of the Investigations Journal that they will be filling out. You might choose to have them write answers to the questions a step at a time as you work together, or might choose to have them fill this out at the end of their experimenting.

Do the investigation. Identify and test one seed at a time, either in the whole group or by calling students one group at a time and recording results publicly.

- Before putting into the water ask, *“What do you predict is going to happen? What about the seed makes you think it will/will not be a good floater?”*
- Ask students to place the seed on the water. They may need to think about **what part** would be likely to fall off the plant and travel (that is, are they going to test just the seed or the seed in its pod, or the whole branch of the plant that the seeds are on). Students can be supported to imagine their plant by the water and think about what would likely fall off and travel. In many cases, this will be the seed and its pod or hairs/fluff.
- Put the seed or seedpod in the water
- Ask students, *“What happened?”* helping students describe whether their seed floated (and moved in the water). You might ask students to record the seed’s position and movement in a public location.

Once all seeds have been tested, remind students that scientists record information about their investigations and what they learned or are curious about now. If you have not already done so, display the recording sheet and walk students through what they are expected to record.

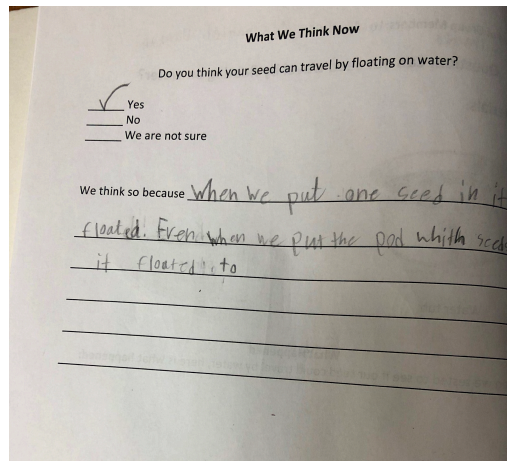
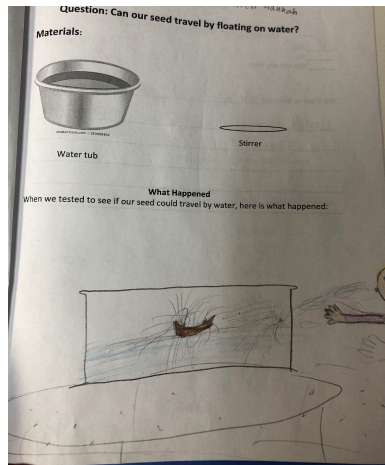
Students work with their groups to record what happens and what they think now.

They record their thinking about:

- What happened (did their seed float or not, through drawing or writing) and,
- What they think now and why

Make sure students have time to write their ideas down and record what happened; if you need to you can give them a few minutes to finish at the beginning of Day 2.





Day 2

Make a connection to the anchoring phenomenon and students' progress:

We're trying to understand how our seeds might get to new places. Yesterday we watched a coconut floating on water and then tested what happened with each of our seeds in a tub of water.

Set a purpose for today: *Today we are going to discuss what we are now thinking about our seeds traveling by floating on water and why.*

Help students make and discuss claims about whether their seed could travel by floating.

Using your results chart, move through each seed, starting with the students who recorded the information for that seed but then opening up to the class as a whole. Consider beginning with ones that you know students will agree about.

- *Do you now think your seed can travel by water? Why or why not? What happened in the investigation?*
- *What is it about this seed that helped it float or stopped it from floating? With this question, you are helping make connections to the form of the seed (its heaviness, etc).*



As each seed is being discussed, record student thinking on a Water Investigations Chart like the one below (see examples above).

Seed	Travels by floating on water? (Y/N/Not Sure)	Our evidence & thinking

Teacher Note: Throughout the investigations, it is possible that students will end investigations by disagreeing or not feeling sure. Perhaps their seed floated for a bit and then sank, or they wonder if the seed sticks so well to animals it will never come off, or the maple seed did not travel by wind in the test but they think it does outside. You can honor and record their unsureness with a question mark or an “unsure.” (See the example charts above). Part of the work of second grade investigations will be recognizing that we don’t always get all the information we need from investigations—we often need to discuss, try again, or find out more information.

Help students extend beyond the tub to think about whether their seed could travel by water in the backyard: Put up the map of the school property or neighborhood where you have collected seeds.

I’m curious about what you think about whether your seeds could get to a new place in our backyard or outside the backyard by floating on water.

What do you think? Start with someone whose seed does float on water. Do you think that we’ll find your plant in a new place next year because it fell off the plant and floated on water to get there? Where could it travel by water?

Do others agree or disagree? Allow a few students to share ideas and build from each others’ thinking.

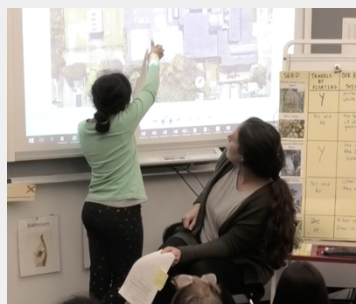
For more support, you can point to a place students’ plants are outside the school on the map and say, *I’m imagining your seed on its plant in our backyard and falling off the plant. Are you thinking that it will travel by water to a new place?*



Other questions you might ask after students share ideas or to extend and deepen student ideas.

- *What is different about our backyard and where the palm tree grows? (islands in the middle of the ocean; coconut can fall on beach and into water)*
- *In what different ways does water move in our neighborhood? (rain drops, down hills, puddles, etc.) versus the ocean?*

Teacher Note: Throughout this conversation and the investigation, the map can serve as a resource for supporting students' thinking about their seeds coming from plants and traveling in a particular environment.



End the investigation by summarizing key ideas and pointing out anything that will be interesting to keep thinking about as we do other investigations.

Each investigation is an opportunity to build students' content knowledge, their ways of listening to and learning from each other, and their sense of what it means to do an investigation. Here are some ideas you might highlight if they came up for your students.

- **We can get new information from our investigations!** Some of us predicted our seeds would/wouldn't float but then they did something different. This is great; that's how investigations help us learn.
- **It will be important for us to design our tests to help us understand what could happen outside our school.** We figured out a lot of our seeds float, but then we still aren't sure if they would travel by water outside our school because we don't have a river or ocean right here.
- **The features of our seeds help them travel!** You might highlight the ways that students thought about how light or heavy their seed is, how fluff or air in a pod could help the seed travel, etc.

