

Disappearing Pumpkins

OVERVIEW: October is the month for pumpkin lessons! Pumpkins can be used for so many classroom activities. Compare them, measure them, graph them, study their life cycle, cut them open and count the seeds. Then carve them into a jolly Jack O'Lantern. But when Halloween is over, don't throw out that pumpkin! Do one more experiment that will last for months. Allow your students to watch how the pumpkin decomposes, one week at a time.



GRADES: 3-5

OBJECTIVES:

Science: The student will be able to define decomposition.

The student will be able to describe the decomposition process and explain why it happens.

The student will be able to identify several different decomposers.

Language Arts: The student will be able to keep a weekly journal describing the decomposition of a pumpkin.

MATERIALS:

One used Jack O'Lantern or one whole pumpkin

Journals or notebooks for students' written and drawn observations.

The book *From the Garden State to Your Plate, Farming Fruits and Vegetables in New Jersey*. A digital copy is available [here](#).

The book *Rotten Pumpkin, A Rotten Tale in 15 Voices*, by David M. Schwartz

If you plan to do the decomposition experiment indoors:

One sealed, clear container such as a plastic storage container with a top or an aquarium sealed by tape with plastic wrap or aluminum foil

Soil to line the bottom of the clear container. This soil should be taken from your garden or another place outside. Do not use potting soil.

Optional: The New Jersey Agriculture in the Classroom powerpoint presentation *Decomposition - How Nature Recycles*, available to download [here](#).

This experiment can be conducted in two ways. First, the pumpkin can be placed outside in your school garden or another place on school grounds where it won't be disturbed. If you choose this method, you must bring your students outside to observe the pumpkin once each week. Be sure to put the pumpkin in a place where it won't be disturbed and alert the school maintenance team to your experiment.

Second, the experiment can be done inside by placing the pumpkin in a clear, sealed container. A clear, plastic storage container big enough to hold the pumpkin works well or you can use an old aquarium sealed tightly at the top with plastic wrap or aluminum foil. The seal is important to prevent the smell of the decomposing pumpkin from invading your classroom. Line the plastic container with about four inches of soil taken from outdoors, not from a bag purchased in a store. The experiment will work best if the soil is moist, perhaps from under some dead leaves, and contains some worms and pill bugs.

PROCEDURE:

Tell students today they are going to learn about one of New Jersey's top 10 crops: squash. Ask students if they can name a type of squash. Read pages 20-21 in the book *From the Garden State to Your Plate, Farming Fruits and Vegetables in New Jersey* (see link under Materials). Ask students what they have learned about the life cycle of a squash.

If you are using an uncut pumpkin, show students the class pumpkin, and explain that you are going to carve the pumpkin to see what is inside and to make a Jack O'Lantern for Halloween. You could put students in small groups to design a face for the pumpkin, and then ask students to vote on the pumpkin face they like the best. Carve the pumpkin, allowing each student to see the inside and scoop out some pulp and seeds. Be sure to leave a handful of seeds on the bottom of the pumpkin. You can save the rest of the seeds to make roasted pumpkin seeds for a snack.

When Halloween is over, tell students they are going to use the spent Jack O'Lantern to do an experiment. Begin a conversation about decomposition. Ask the students if they have ever walked through a wooded area in the fall when the ground was covered with fallen leaves. Then ask: if you visited the same wooded area in the spring, would the leaves still be on the ground? The leaves would mostly have disappeared. Ask: what happened to the leaves?

When any living thing dies, fungi and bacteria get to work breaking it down. Put another way, they decompose things. Soil contains thousands of types of single-celled fungi and bacteria, which you cannot see without a microscope, that break down dead animal and plant matter. Mushrooms and other multi-celled fungi that are visible to the naked eye also decompose organic (or once living) matter. So do worms, slugs, roly polies (also called pill or sow bugs), as well as some insects like flies.

Optional: View and discuss the New Jersey Agriculture in the Classroom powerpoint presentation [Decomposition - How Nature Recycles](#) (see link under Materials).

Rotting can be yucky and disgusting. Still, it is vitally important. Decomposition aids farmers by putting essential nutrients back in to the soil that plants need to grow.

Read and discuss the book *Rotten Pumpkin, A Rotten Tale in 15 Voices* by David M. Schwartz. The book describes 15 decomposers one at a time, so you can read the book in increments if you are pressed for time.

Tell the students they are going to observe what happens to their class pumpkin over time. Set the pumpkin in a place outside where it will not be disturbed or inside a clear, covered container lined with soil taken from outside.

Students observe the pumpkin at the same time each week, and record in their journals or in the worksheet provided what is happening to the pumpkin.

If you are doing the indoor experiment, at least once the teacher should remove the top of the container so students can experience the smell that accompanies decomposition and describe it in their journals.

Continue to observe what happens to the pumpkin until the decomposition process is complete.

EVALUATION:

The student can define decomposition, describe the decomposition process, and explain why it happens.

Completed student journals.

EXTENSIONS:

Extend your discussion of decomposition by discussing what decomposes and what doesn't. Place some other items, such as an aluminum can, a plastic bottle, and a piece of newspaper, outside with the pumpkin or inside the clear container. Compare what happens to the pumpkin and the other items.

Add some math to the lesson by asking students in small groups to estimate the number of seeds inside the pumpkin before you cut it. See the New Jersey Agriculture in the Classroom lesson *How Many Seeds in a Pumpkin* available [here](#).

New Jersey Learning Standards

Science: 3:LS1.B 4:LS1.A 5:LS2.A

Social Studies: 3-5:6.1.5.GeoPP.2, 6.1.5.GeoSV.2, 6.1.5.GeoHE.2
6.1.5.EconEM.1, 2, 4; 6.1.5.EconNM.4

English Language Arts: 3:RL.3.1-7 4:RL.4.1-7 5:RL.5.1,2,4,5

Climate Change: 5-LS2.1

Pumpkin Decomposition Observations

Write at least three sentences each week in the spaces below that describe the changes you see in the decomposing pumpkin. Note whether you see any of these mold or bacteria described in the book *Rotten Pumpkins*:

Black rot mold: black mold **Penicillium:** grayish green mold that kills other molds nearby

Fusarium rot: red mold **Yeast:** whitish film

Bread mold: white fuzzy mold **Slime mold:** bright yellow, orange, red, or purple mold

| |
|---------------|
| Week 1 |
| Week 2 |
| Week 3 |
| Week 4 |
| Week 5 |

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Week 13

Week 14

Week 15

Week 16

Week 17

Week 18

Week 19

Week 20

You can add more rows if you are continuing your observations.