

DECOMPOSITION

Decomposition is how nature recycles. It is the way that nature breaks down old, dead organic matter and recycles it into soil materials that can be used to support new plants and life. The “FBI”—fungus, bacteria and Invertebrates that live in our soil, air and water—are responsible for decomposition of the organic matter. Composting is when people put nature’s natural recycling processes to work in a controlled way using bins, piles or pits to decompose garden and food scraps from their own homes or school. These two small scale activities illustrate to students that “rot happens.” We encourage you to begin larger scale composting of your garden wastes and even cafeteria or classroom food wastes. Vermicomposting, composting of food wastes using worms, is a wonderful classroom project. The internet contains a myriad of resources to get you started on both traditional and vermicomposting. Two introductory activities on composting are (1) Watch Me Rot and (2) Digging In and Out.

Activity #1: Watch Me Rot

Objective: Students will observe as different foods decompose.

Activity: Students will place small pieces of foods in bags and observe them as they decompose over time.

Grades: 3-6

Materials: Divide students into groups of 3-4 and provide each with the following:

- 1 piece of food to observe decomposing—small pieces of soft foods work best. Some good examples include slices or small pieces of bread (preferably a variety that does not contain preservatives), half an apple or pear, opened banana with peel, lettuce,
- 1 ziplock bag, big enough to hold your food sample
- Magnifying glasses—one per student or pair of students
- 1 Dixie cup of soil
- Water
- Permanent marker
- Science journal or data worksheet for recording observations

Location: Inside

Lesson: The decomposer FBI, of fungus, bacteria and invertebrates, go to work very quickly to break down organic matter. Discuss with students when they have had food go bad at their own houses—mold on bread or squishy, rotting fruit. Decomposition happens even more quickly when there are lots of decomposers around to go to work, like in the soil. By placing soil in the bags with the food items, students can see how quickly the decomposition happens. Have students hypothesize how long it will take the different types of food to begin to decompose—which foods will decompose fastest and why?

Directions:

1. Give each group a food item to use.
2. Have group write on outside of bag the food item they have and the date.

3. Have students put a small scoop of soil in the bag and place the food item on top of it. Seal the bag closed. Try to minimize any shaking of the bag. If the food item is covered with dirt, it is harder to tell when the decomposition is starting. Optional: Have students sprinkle a bit of water on the soil and food item.
4. Place all the bags together in a location that will be undisturbed but easily accessible for observation.
5. Have students observe the bags daily with both naked eye and magnifying glasses. Have them record the changes. Have them crack open the bags and reclose daily or every other day in order to get fresh air into the bags. Without fresh air, they will get anaerobic decomposition, a different and smellier process.
6. After several weeks of observations, discuss together the changes the students observed—what did decomposition look like on the various items, which item decomposed fastest, etc.

Activity #2: Digging In and Out

Objective: Students will use pit composting either in the ground or in a bucket to observe what happens in a compost pile over time.

Activity: Students will place food items in a hole dug in the ground, cover them with soil and several weeks later dig them up to observe the changes. If the school does not have a location where a pit can be dug, the activity can be done in a 5-gallon bucket filled with soil.

Grades: 4-8

Materials:

If doing an in-ground pit:

- Location on school grounds where students can dig a 1 1/2 foot wide x 1 1/2 foot deep pit that can stay undisturbed for 2-4 weeks of activity
- 1-2 apples, cut in half
- Shovel, both for digging hole and for later digging up decomposed items
- Water
- Large flat rock or pile smaller rocks to cover pit hole
- Paint stirring stick or other marker to mark pit location
- Permanent marker
- Science journal

If doing activity in a bucket:

- 5-gallon bucket and lid, with 6-8 small holes drilled in bottom and lid for air circulation
- Potting soil—enough to fill bucket at least $\frac{3}{4}$ full.
- 1-2 apples, cut in half
- Water
- Shovel or trowel for adding soil to bucket and digging up decomposed items.
- Masking tape
- Permanent marker
- Science journal

Location: Outside in the garden.

Lesson: As discussed in the Watch Me Rot activity above, the decomposer FBI of fungus, bacteria and invertebrates go to work very quickly to break down organic matter. In that activity, students could see how decomposition might happen in their kitchen. Decomposition happens even more quickly when there are lots of decomposers around to go to work, like when organic matter is buried in the soil. The soil all around combined with moisture and darkness is an ideal environment for the FBI to do its job.

If doing an in-ground pit:

1. Have students work together to dig a pit at least 1 ½ foot wide and deep. They should set soil carefully to side as they dig because they will use that soil to cover items in pit.
2. Put 3-4 inches of soil back into pit so soil at bottom of pit is nice and loose
3. Place cut up apple(s) in the bottom of pit.
4. Sprinkle apples with water until damp, but not soaking and cover with remaining soil. Sprinkle on top of the soil until moist.
5. Mark pit by placing stones over top of pit and sinking paint stick or other marker in soil over pit to mark it. Write the date and items buried on the stick or marker.
6. After a week, have students dig up and examine items in the pit. They should record observations in their science journals.
7. Replace material and recover. You may dig up weekly for as long as you want activity and observation to continue and you can still locate your apples.

If using a 5-gallon bucket:

1. Fill the bucket 1/3 full with soil.
2. Place apples on top of soil and sprinkle with water.
3. Fill up bucket until at least ¾ full of soil. Sprinkle top of soil and place lid.
4. Using masking tape label the bucket with the date the activity began.
5. After a week, have students open the bucket and dig up and examine items. They should record observations in their science journals.
6. Replace material and recover. You may dig up weekly for as long as you want activity and observation to continue and you can still locate your apples.