



LESSON PLAN **Rusty's Rot Race**

Objective

This lesson will reinforce the importance of separating food scraps into the organics bin. Students will journey with Rusty to follow an apple from the orchard throughout its lifespan to explore the differing rates of decomposition of food waste in the landfill vs. the organics bin. Students will make determinations based on current assumptions of trash or garbage and will be prompted to consider their individual impact as consumers and contributors to the waste stream.

Teacher Background

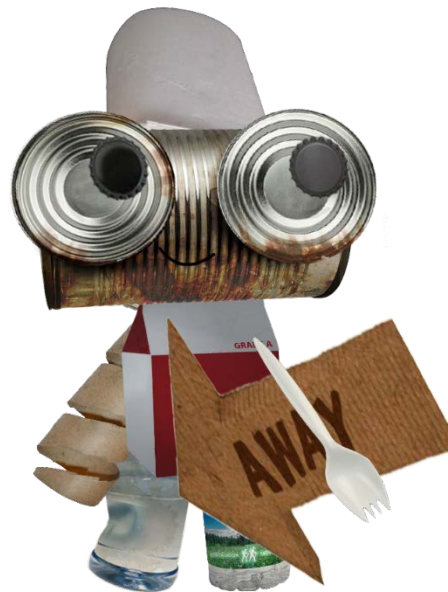
Organic waste is the largest contributor to landfills in the United States. Americans toss 40% of all food produced each year, which costs our country roughly \$165 billion annually. Aside from the economic impact, food waste has a huge effect on the environment. As food waste decomposes in a landfill, it releases methane, a major greenhouse gas that's 20-30x more potent than carbon dioxide. Food waste has doubled in the past 50 years but there are many solutions. This lesson explores the simple in-school solution of composting, as compared to sending our food scraps to the landfill.

Materials Needed

For mini-landfill:

Clear lidded containers such as a takeout or Rubbermaid container
handful of soil/compost
handful of rocks/pebbles
green construction paper
non-organic school waste
(i.e. pieces of milk cartons, wrappers, plastic film, etc.)

2 (or more) apples for demo and snack
Rusty's Rot Race Worksheets for each student



Procedure

Introduction: Hypothesis and Mapping

1. Show Rusty's Race to Away video.
2. Facilitate a brief discussion on where our food comes from. Use an apple as an example. Cut up a few apples to serve as a snack. Leave a few cut apples off to the side for later observation. Explain that apple orchards are where apple trees are grown. Many are located near New York City. Apple trees-like all plants- grow from sun, soil and water. They produce fruit, or apples. We can pick these apples, take them home or to school and eat them.

3. Show on a map where some apple orchards are located near NYC.
4. Talk about our choices as consumers and generators of food waste: Say we're hungry and eat an apple as a snack- once we eat an apple, most of the energy and nutrients from the apple is now in us, making our minds and bodies healthier. But, some of this energy is still in the apple cores. We're not going to eat the apple cores so what do we do with them? We throw them "away."
5. Explain that we have two options when throwing away food waste. We can put them in the trash bin or in the food scraps/compost/organics bin. Show pictures of both bins or physical examples of both bins.
6. Tell the class that they will now take part in an investigation exploring two apples- Apple 1 is thrown in the compost bin, and Apple 2 is thrown in the trash. The apples are going on a "Rot Race" and the first apple to go rot-or *decompose- is the winner. Can you predict who will win?

Definition: Decomposition is the natural breaking down of organic materials. It is the main way that nutrients are recycled into the soil. Decomposing means to rot or decay.

7. Pass out worksheets to each student and give them a few minutes to complete their hypotheses about Rusty's Rot Race.

Stage 1: From the Bin to the Truck

Explain to the class that with the help of the school's custodians, the apples will race along two separate paths after we throw them "away." At the end of the school day, custodians will roll the bins to the curb or to a storage area in or outside the building where they will stay until the day they are picked up.

Help students use the Department of Sanitation Pick-Up Schedule to plot both apples on the Rot Race from the bin to the truck as they work individually or in groups.

Use your apples to physically represent which apple is in the lead as they move from the bin to the truck.

Stage 2: From the Truck to Away

NYC-including NYC schools- sends its waste to many different states and facilities. Apple 1 continues traveling to McEnroe Farm in Millerton, NY- about 90 miles away from NYC- where it will be composted. Apple 2 journeys to Laurel Highlands Landfill in Johnstown, PA- about 300 miles away from NYC- where it will be landfilled.

Direct students to continue with their worksheets to calculate how long it will take both apples to travel to Away.

Use your apples to physically represent which apple is in the lead as they make it to Away.

Stage 3: From Away to Decomposition

Return to the cut apples that were set aside. What is needed for organic material to break down, decompose, rot? Let's look at the apples we sliced, what's already happening to them, why is this happening?

Explain that the class will continue their journey all the way down to a microscopic level, as microbes and bacteria begin to help the apples rot. Show a short time-lapse video of food breaking down in a compost pile (or a worm bin if your class has one) to represent the end of Apple 1's journey to Away. **Apples that are composted take a week or two to decompose.**

Prior to class, or during the lesson (depending on time) build a mini-landfill by layering soil, pebbles, inorganic school waste and green paper (to represent land) in layers one on top of another in your clear sealable container to represent the end of Apple 2's journey.

Provide explanations to students about why things do not decompose rapidly in a landfill. Items buried in a landfill MUCH longer to decompose because many decomposers need *oxygen* and *moisture* to decompose apples and other materials. Most landfills are not exposed to air, because the garbage is covered with soil to keep it from smelling and attracting animals. As a result, **apples that are sent to the landfill may take decades to decompose.**

Check for Understanding

Where does food waste break down more quickly? Why is that important?

Is there something we can do instead with our food waste so that we don't have to send it to landfills?

What are our options? Why are they important?

Review of cafeteria trash and organics bins and how to properly sort in the cafeteria.