



# Trash Talk

Students will learn about where our waste products go by playing games with garbage.

## Skill Level:

Beginner—Intermediate

## Learner Outcomes:

Understand what waste items are biodegradable and recyclable

## TN Science Curriculum Standards:

GLE0607.T/E.3

## Materials needed:

Bag of trash items, one for each small group

Examples of products made from recycled materials (optional)

Calculators and pencils

## Time needed:

30 minutes

## Success Indicator:

Students can explain the fate of waste items

**Life Skills:** Observing, Reasoning, Communicating

## Tags:

Biodegradation, recycling, landfill, waste, reuse

## Set Up

Have several trash bags filled with a variety of garbage: plastics, cardboard, styrofoam, grass clipping, leaves, sticks/wood, food waste. (If reusing a bag for multiple demonstrations, use 'fake' food waste so it doesn't get slimy—cut fabric in the shape of banana peels, apple cores, etc.) For younger students, have few items (6-10), for older students, go with more items (12+). You may want to throw in some 'trick' items like biodegradable plastics or cornstarch packing peanuts to stimulate discussion.

*Alternate:* Don't want to carry around a bag of garbage? Give your students pictures of common trash items.

## Introduce the activity

Tell your students that it's time to sort the trash. Introduce/reinforce the following terms and concepts:

**Biodegradable**—these are items that are originally derived from plant or animal sources, and can be broken down by microbes (decomposed). They are comprised of chemicals that microbes would normally 'eat', so they just see it as 'food'. These items are also compostable.

**Non-biodegradable**—these are materials that are derived from inorganic or synthetic sources, and cannot be broken down by microbes (decomposed). This is because the microbes don't normally 'eat' these types of materials.

**Recyclable**—these are materials that can be broken down and re-made into something else. Different recycling programs may accept slightly different items, so it would be good to review your local recycling rules with your students. Note that both biodegradable and non-biodegradable items can be recycled.

## Activity: Trash Olympics!

Divide your students into teams and give each a bag of trash. In each round, the teams are given a task. You can either make it competitive by time (first team to correctly complete the task) OR award points for having the correct sorting/arranging of items.

### Round 1: Recyclables

Ask the teams to sort items into two piles: recyclable and non-recyclable. Use your local recycling rules as a guide.

*Discuss:*

-Recycling breaks down and re-makes items out of these products. (Show some example products if available).

-The other pile ends up in the landfill. Ask your students if there is anything that they can do to reduce the amount of materials going to the landfill. (Answer: biodegradable materials could be composted, reuse items, specialty recycling etc.)

### Round 2: Biodegradable vs. non-biodegradable

In this round, students sort items into two piles: biodegradable and non-biodegradable.

*Discuss:*

-How we can "re-use" organic waste (Answer: composting). Composting lets these organic wastes decompose, creating a nutrient-rich humus (compost) that can be added back to gardens. Industrial composting facilities are limited in Tennessee and most only take yard trimmings.



-Food scraps could be composted at home. Unfortunately, most of our food waste ends up in landfills. This is a problem because it requires energy to transport the waste. Once in the landfill, decomposing food produces a lot of methane, a potent greenhouse gas.

**Round 3: How long?**

In the final round, teams must sort the trash items in order of how long they take to decompose. Use the numbers to the right to guide you. There will not be a 100% clear cut answer on some items, but in general, teams should have:

1. Food/yard waste and paper
2. Textiles
3. Wood
4. Milk cartons or coated cardboard
5. Rubber/leather
6. Nylon/synthetic clothing
7. Tin cans
8. Aluminum cans
9. Styrofoam, diapers, plastic bags, plastic bottles
10. Glass

HOW LONG DOES IT TAKE TO DECOMPOSE	
Paper Towel	- 2-4 weeks
Banana Peel	- 3-4 weeks
Paper Bag	- 1 month
Newspaper	- 1.5 months
Apple Core	- 2 months
Cardboard	- 2 months
Cotton Glove	- 3 months
Orange peels	- 6 months
Plywood	- 1-3 years
Wool Sock	- 1-5 years
Milk Cartons	- 5 years
Cigarette Butts	- 10-12 years
Leather shoes	- 25-40 years
Tinned Steel Can	- 50 years
Foamed Plastic Cups	- 50 years
Rubber-Boot Sole	- 50-80 years
Plastic containers	- 50-80 years
Aluminum Can	- 200-500 yrs
Plastic Bottles	- 450 years
Disposable Diapers	- 550 years
Monofilament Fishing Line	- 600 years
Plastic Bags	- 200-1000 yrs

This will create awareness amongst people that this is also one of the reasons related to Global Green House Effect. Thank you for Sharing. **CHANGE EVERYTHING**

**Discuss:**

- Were there any items that surprised you in terms of how long they last?
- Knowing how slowly some things decompose, can you propose some substitutions (e.g. cardboard instead of plastic packaging)?
- Have each student pick one object and describe one thing they could do to keep it out of the landfill (e.g. repurpose, donate to charity, recycle, use a re-usable item instead, chose an alternate material).

**Generalize & Apply**

Lead the class in a discussion about ways to reduce the amount of garbage going to the landfill. (Answers: recycling, composting, re-using, reducing the amount of packaging etc., buying recycled products.)

Challenge the students to do one specific thing this week to save something from the landfill (e.g. recycle their soda can, use a re-usable container for their lunch).

## Answers from Student Handout:

### Sort Out Your Trash!

Note that what is recyclable may depend on your local recycling plant rules. Items marked here are *typically* recyclable.

	Is it bio-degradable?	Recyclable?	Not recyclable or bio-degradable
Styrofoam cup			<input checked="" type="checkbox"/>
Cardboard cereal box	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Banana peel	<input checked="" type="checkbox"/>		
Plastic grocery bag		<input checked="" type="checkbox"/>	
Aluminum foil			<input checked="" type="checkbox"/>
Grass clippings	<input checked="" type="checkbox"/>		
Plastic wrap			<input checked="" type="checkbox"/>
Wooden chopsticks	<input checked="" type="checkbox"/>		
Paper	<input checked="" type="checkbox"/>		
Bacon grease	<input checked="" type="checkbox"/>		
Soda can		<input checked="" type="checkbox"/>	
Old rags	<input checked="" type="checkbox"/>		
Peanut shells	<input checked="" type="checkbox"/>		
Milk carton			<input checked="" type="checkbox"/>
Glass jar		<input checked="" type="checkbox"/>	
Old cellphone		<input checked="" type="checkbox"/>	
Junk mail	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Soda bottle		<input checked="" type="checkbox"/>	

### Calculate your impact!

Have your students solve the math problems. Most require estimation, so answers will be variable. Here are some example answers:

1. Recycling 1 glass jar saves enough energy to run an 11-watt bulb for 20 hours. How many days could you run the bulb if you recycled 12 glass jars?

**Answer: 12 jars x 20 hours = 240 hours / 24 hours = 10 days**

2. Recycling 1 aluminum can saves enough energy to power a TV or computer for 3 hours. How many aluminum cans would it take to power your TV/computer use from yesterday?

**Answer: Assuming 6 hours of screen time: 6 hours / 3 hours = 2 cans**

3.a. Each person in the US produces about 20 pounds of food waste per month, and most of that ends up in the landfill. Assume that you produce half of this waste at home (10 pounds per month per person). If your family started a backyard compost bin for your food scraps, how many pounds of food waste would you keep out of the landfill next month?

**Answer: Assuming 5 family members: 5 people \* 10 pounds = 50 pounds of food waste**

3.b. Assume that you produce the other half of the food waste at school (10 pounds per person per month). If your

school started composting food scraps, how many pounds of food waste would you keep out of the landfill next month?

**Answer: Assuming 500 kids in the school:  $500 \text{ people} * 10 \text{ pounds} = 5,000 \text{ pounds of food waste}$**

4.a. You want to add some nutritious compost to your garden. Your garden is 6 feet x 8 feet and you want to cover it with 6 inches (0.5 feet) of compost. How much compost do you need?

**Answer:  $6 \text{ feet} * 8 \text{ feet} * 0.5 \text{ feet} = 24 \text{ cubic feet}$**

4.b. A bag of compost (1 cubic foot) from the store costs \$5.00. But you compost your food waste in a backyard composter, and had enough to cover your garden. How much money did you save?

**Answer:  $24 \text{ cubic feet} * \$5.00 = \$120$**



## Extensions and Variations

### Go on a litter walk

Take the kids on a litter clean-up walk. Not only will you teach them about the different items you find and their fate, you'll also help clean up the area!

### Adopt a recycling or composting service project

There are many ways kids can get involved in recycling or composting.

Check out these website for some ideas:

<https://www.recycleyourplastics.org/consumers/kids-recycling/kids-can/>

<http://www.mykidsadventures.com/five-fun-composting-projects-for-kids/>

### Recycled Art

There are many great ideas online for art projects using waste. For example:

Make your own recycled paper: <http://pbskids.org/zoom/activities/sci/recyclingpaper.html>

Reuse junkmail in creative ways: <http://www.care2.com/greenliving/junk-mail.html>

Repurpose old stuff: <http://www.upcyclethat.com/make-that/kids-make-that/>