

# Backyard STEM Trash Talk

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# Tennessee 4-H Youth Development

## ***Trash Talk***

*Do you know what happens to your garbage?*

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### **Skill Level**

Beginner-Intermediate

### **Learner Outcomes**

*The learner will be able to:*

- Understand which waste items are biodegradable and which are recyclable

### **Educational Standard(s) Supported**

4.ESS3.2

5.ETS1.3

### **Success Indicator**

*Learners will be successful if they:*

- Explain the fate of waste items

### **Time Needed**

30 minutes

### **Materials List**

- Bag of trash items, one per group
- Printed list of items accepted by your local recycling company, one per group
- Examples of products made from recyclable materials (optional)

### **Introduction to Content**

This lesson focuses on the life of waste products after they have been consumed or used up. These activities are meant to help students make good choices about the environment and the way they dispose of everyday items.

### **Introduction to Methodology**

Students will learn about where our waste products go by playing games with garbage. By familiarizing themselves with the types of items that are disposed, students will be able to make the right decisions on their own about what to recycle, compost or throw away.

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## Terms and Concepts Introduction

**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 these items 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 recyclable items can be either biodegradable or non-biodegradable.

## Setting the Stage and Opening Questions

Ask students, “**When you throw things away, where do they go?**” Guide students to understand that trash will go to a landfill. Ask students, “**What can people do with trash other than just throwing it away?**” *Answers might include recycling or reusing materials.*

## Experience

### Activity: Sort Your Trash!

Tell your students that it’s time to sort the trash. Divide your students into teams and give each a bag of trash (see Supplemental Information for options for preparing these bags in advance). In each round, the teams are given a task. You can either make it competitive by time (i.e., 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 trash items into two piles: recyclable and non-recyclable. Use your local recycling rules as a guide. Tell students that products are broken down and used to re-make new products at the recycling plant. Show some example products made from recycled materials if available. Tell students that the other pile of non-recyclable items 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. *Answers might include: Composting biodegradable materials, reuse or upcycle items, specialty recycling, etc.*

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

In this round, students sort items into two piles: biodegradable and non-biodegradable. Ask students, “**How can we “re-use” biodegradable waste?**” *Answer: composting.* Tell students that 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. Composting is a great solution for biodegradable waste: it lets these 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. But people can use backyard composting for their food scraps.

## Tips for Engagement

Encourage students to brainstorm other waste products that they interact with at home or at school while working on the activities.

### Round 3: How long?

In the final round, teams must sort the trash items in order of how long they take to decompose. Some approximate times are listed below from least to most time. (Note that these are ranges of approximate times, so there may be more than one order that could be considered correct.)

Trash Item	Approximate time to decompose
Paper towels	2 weeks
Banana peel	2-4 weeks
Paper bag, newspaper	1-5 months
Cardboard, cotton	2-5 months
Orange peel	6 months
Plywood	1-3 years
Wool socks	1-5 years
Milk carton	5 years
Cigarette butt	10-12 years
Leather shoe	25-40 years
Nylon fabric	30-40 years
Tin can	50 years
Rubber	50-80 years
Foamed plastic	80 years
Aluminum soda can	100 years
Plastic bottles	450 years
Styrofoam cups	500 years
Disposable diapers	550 years
Plastic bags	200-1,000 years
Glass bottle	1,000,000 years

### Life Skill(s)

Observing correct and incorrect procedures and using them to make their own decisions. (Head Thinking)

Using reasoning to determine the correct outcome. (Head Thinking)

Communicating ideas and concerns with others to accomplish a task. (Heart Relating)

### Share

Ask students the following questions:

- “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?” *Answers might include using cardboard or paper instead of plastic packaging and bags.*

### Process

Ask students, “Pick one object. What is one thing you could do to keep it out of the landfill?” *Answers might include repurpose, donate to charity, recycle, use a re-usable item instead, choose an alternate material.*

### Generalize

Ask students, “What are ways we can reduce the amount of garbage going to the landfill?” *Answers might include recycling, composting, re-using, reducing the amount of packaging, buying recycled products.*

### Apply

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

## ***Supplemental Information***

### ***Educational Standards Met***

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**4.ESS3.2** Create an argument, using evidence from research, that human activity (farming, mining, building) can affect the land and ocean in positive and/or negative ways.

**5.ETS1.3** Describe how failure provides valuable information toward finding a solution

#### **Activity Set Up Options**

Have one trash bag per team filled with a variety of garbage: plastics, cardboard, Styrofoam, grass clipping, leaves, sticks/wood, food waste. Try to have items that are biodegradable, non-biodegradable, recyclable and non-recyclable. If reusing a bag for multiple demonstrations, use ‘fake’ food waste so it doesn’t get slimy—use toy food, cut fabric in the shape of banana peels, apple cores, etc., or print out pictures. For younger students, have fewer items (6-10), for older students, go with more items (12+). You may want 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 to sort instead.

#### **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 websites for some ideas:  
<https://www.recycleyourplastics.org/consumers/kids-recycling/kids-can/>  
<http://www.mykidsadventures.com/five-fun-composting-projects-for-kids/>
- **Make recycled art.** There are many great ideas online for art projects using waste. For example:  
Make your own recycled paper: [https://www.teachengineering.org/activities/view/make\\_recycled\\_paper](https://www.teachengineering.org/activities/view/make_recycled_paper)  
Reuse junkmail in creative ways: <https://craftingagreenworld.com/articles/15-awesome-junk-mail-crafts/>  
Crafts with recycled materials: <https://www.weareteachers.com/earth-day-crafts-classroom-activities/>