



"Ghosts of Trash Past: The Long Life of Waste" October 2024 Lesson Plan -Middle

Lesson Overview

Students will investigate how long different types of waste take to decompose, the environmental impact of waste in landfills, and how proper waste management and recycling can reduce harm to the planet. The lesson will focus on decomposition processes for organic waste like pumpkins, as well as paper, plastics, and textiles, including a special focus on clothing waste. Students will also engage in a Halloween-themed group project, creating “Trash Monsters” from recyclables while discussing how their creations reflect real environmental challenges.

Objectives

By the end of the lesson, students will:

1. Analyze how long different types of waste take to decompose.
2. Understand the environmental consequences of waste accumulating in landfills, including methane emissions and pollution.
3. Learn how proper waste management, recycling, and composting can help reduce environmental harm.
4. Participate in a creative project using recyclable materials to explore solutions to waste issues.

Time:

1 hour 40 minutes + Optional extension activities

Materials Needed:

- Decomposition timeline (visual or handout) showing pumpkins, paper, plastic, clothing, etc.
- Samples: small pumpkin, paper, piece of cotton fabric, plastic bottle
- Whiteboard/markers
- Internet or projector (optional for landfill video)
- Craft materials: recyclable items (plastic bottles, old fabric, paper, metal cans), glue, tape, markers, paint, string, googly eyes, scissors
- Halloween-themed "Trash Monster" worksheet for reflection
- Decomposition experiment materials (optional extension)



Vocabulary:

- Decomposition
 - Landfill
 - Greenhouse Gas
 - Methane
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Introduction (10-15 minutes)

Hook:

- Ask students: “What do you think happens to trash after we throw it away?”
- Present images of landfills and waste piles. Encourage students to share their thoughts on how long trash sticks around and what happens to it.

Engage:

- Present the theme: “Today, we’re going to dig into the *Ghosts of Trash Past* and explore how the things we throw away linger in the environment like spooky spirits. We’ll learn how long different types of waste decompose and how we can reduce the impact on our planet.”

Objective Discussion:

- Explain that they’ll be investigating how things decompose, what happens when waste sits in landfills, and how proper disposal like recycling can make a difference.
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Part 1: Decomposition Investigation (20 minutes)

Activity 1: Decomposition Exploration

1. Present the real samples (pumpkin, paper, fabric, plastic bottle). Ask students to predict how long each will take to break down in a landfill.
2. Display the decomposition timeline, highlighting various materials:
 - Pumpkin: 2-3 months
 - Paper: 2-6 weeks
 - Plastic Bottle: 450 years
 - Clothing (cotton): 5-6 months
 - Clothing (polyester): 20-200 years
3. Reveal the actual decomposition times and discuss the significant difference in timescales, especially for plastics and synthetic textiles.



Discussion:

- Ask students to consider: “Why do certain materials, like plastics and synthetic clothes, last so much longer than others?”
 - Explain that non-biodegradable materials do not break down easily and pose long-term risks to ecosystems.
 - Explore how textiles, especially polyester, contribute to the growing waste problem since they are used in fast fashion and don’t decompose quickly.
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Part 2: Landfills and the Environment (15 minutes)

What Happens in a Landfill?

- Explain that most of the waste we throw away ends up in landfills, where items break down slowly due to the lack of sunlight, oxygen, and microbial activity. This leads to the production of methane gas, a powerful greenhouse gas that contributes to global warming.
- Show an infographic or short video of a landfill to illustrate what happens beneath the surface (e.g., layers of trash, gas release, and leachate).
 - Youtube: [What Happens to Our 2.2 Billion Tons of Trash?](#) (5:32)
- Emphasize the role of organic waste (like pumpkins) in producing methane, while plastics and synthetic materials can pollute the soil and water for decades.

Environmental Consequences:

- Discuss how landfill gasses contribute to climate change and how long-lasting waste can harm animals, seep into water supplies, and eventually end up in oceans.
- Ask: “What can we do to reduce the amount of waste going to landfills?”

Solutions:

- Introduce concepts like recycling, composting, and donating or repurposing old clothes to reduce waste.
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Part 3: Halloween-Themed Project – “Trash Monsters” (25-30 minutes)

Introduction:

- Tell students they will now create their very own *Trash Monster*, using recyclable materials to design a creature that reflects environmental issues associated with waste.



The monster will serve as a reminder of how long different materials last in the environment.

Instructions:

1. Split the class into small groups and provide each group with recyclable materials (e.g., plastic bottles, old fabric, metal cans, cardboard).
2. Each group will design and create a *Trash Monster* using the materials provided. Encourage creativity – their monster should highlight at least one environmental challenge (e.g., plastic waste or clothing waste).
3. As they work, students should consider:
 - What is their monster made of?
 - How long would it take for each material in their monster to decompose?
 - What could be done with these materials to prevent them from becoming long-lasting waste in a landfill?

Presentation:

- After completing their monsters, each group will present their creature to the class, explaining the materials they used and the environmental issues their monster represents.
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Reflection Activity: Ghosts of Trash Past Worksheet (10 minutes)

Worksheet:

- Hand out a *Ghosts of Trash Past* reflection sheet where students draw their monster and answer the following questions:
 1. What materials did you use to create your monster?
 2. How long would it take for each material to decompose in a landfill?
 3. What could you do with these materials instead of throwing them away?
 4. How can you reduce your waste in the future?

Discussion:

- Ask students to share one way they can reduce waste in their own lives, whether it's by recycling, reusing items, or donating clothes.
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Optional Extension: Decomposition Experiment (Optional – Multi-week activity)

Objective:

- Students will observe the decomposition of different materials over time by burying small samples of organic waste, paper, and fabric in containers filled with soil.

Materials:

- Small samples of pumpkin, paper, cotton fabric, polyester fabric, and plastic
- 5 containers filled with soil
- Labels for each container
- Water and a sunny spot

Instructions:

1. Place each material sample in its own container filled with soil. Label each container.
2. Bury the materials and lightly water them. Place them in a sunny area or window.
3. Every week, students will check the decomposition process, noting any changes in color, texture, or smell.
4. After a few weeks, students will compare how quickly each material breaks down.

Reflection:

- At the end of the experiment, discuss the differences between natural and synthetic materials. Why did some materials decompose faster than others?
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Closing Discussion & Extension (5 minutes)

Wrap-Up:

- Reinforce the idea that waste lasts for a long time in landfills and can have serious consequences for the environment.
- Ask: “What can we do every day to reduce the amount of waste we send to landfills?”
- Encourage students to take action at home by starting a compost pile, reducing their use of plastic, or donating old clothes to textile recycling programs.

Extension:



- Encourage students to research how communities are tackling waste issues, such as starting recycling programs or reducing plastic use, and come up with ideas for how their school could participate in waste reduction.
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Suggested Books and Resources

- *Plastic Planet* by Georgia Amson-Bradshaw
 - *Trash Revolution: Breaking the Waste Cycle* by Erica Fyvie
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Closing Activity: Ghosts of Trash Past Reflection (5 minutes)

- Close the lesson by asking students to imagine a future without landfills full of waste. What would that world look like? How can each of us help to make that future possible?
- Encourage them to take small steps to reduce their own waste and be mindful of how long their “trash ghosts” might last in the environment.