

## Chapter 2

# What Happens to Waste?

### Chapter Focus:

The Activities in this chapter will help students understand what happens to waste items, both garbage and recyclables, after they are thrown away. This includes exploring the history of waste disposal, how sanitary landfills work, what happens to school waste, how decomposition works, and the impacts of litter.



## So Many People, So Much Waste

More than eight million people live in New York City and over 50 million more visit each year. While New Yorkers actually create less waste per person than other Americans, the sheer number of people living, working, and visiting the city each year adds up to a lot of trash. With so many people making so much waste, it is important to look at what we are throwing away, where it goes, and how we can reduce the impact our waste has on the environment.

When we throw garbage “away,” it doesn’t just disappear. There is no “away.” There’s always an impact on the environment. Knowing what that impact is can help us make smart choices about what we buy and use, and the best ways to dispose of our waste at home, at school, at work, and in our community.



## What Happens to New York City’s Waste?

Most of New York City’s waste is transported by barge and truck to landfills or burnt in incinerators outside of the city. Moving New York’s waste requires the use of massive amounts of fuel — a nonrenewable resource. Using landfills and incinerators costs money, causes pollution, and takes up a lot of space.

Recycling reduces the amount of waste that New York sends to landfills and incinerators. It also conserves natural resources by reducing the need for raw materials when making new products.

Recycling, however, isn’t a perfect solution. It’s expensive, and uses energy and natural resources in the process. When studying waste disposal options, it is important to keep in mind that each method has environmental tradeoffs.

**Want to know the right way to dispose of a particular item?** Visit [nyc.gov/wasteless](https://www.nyc.gov/wasteless) and click on “Get Rid of Stuff” in the left column.





## What Happens to Waste?

# Knowing Where Garbage Goes After It's Thrown Away

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**Time:**

20 minutes

**Subjects:**

English Language Arts, Science

**Goals and Objectives:**

Students will discuss where non-recyclable garbage goes and learn about the history of New York City's waste disposal system. They will read and complete **Knowing Where Garbage Goes Handout** and a writing assignment.

**Vocabulary:**

decomposition, groundwater, incinerators, landfill, landfill gas, leachate, organic

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**Materials:**

- Copies of **Knowing Where Garbage Goes Handout**
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## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

**Teacher Prep:**

If this is your first Activity from this chapter, please read the **Chapter 2 Introduction**. Refer to the **Glossary** for definitions of vocabulary words.

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of where garbage goes after it's thrown away.

**Suggested Discussion:** What happens to waste when you throw it away? What are all of the possible avenues for discarded waste? Where does waste go when it isn't reused or recycled?

**Exploration:**

1. Distribute **Knowing Where Garbage Goes Handout**.
2. Have the class read it individually or as a group.
3. Ask them to complete the second side of the handout and assign a follow-up writing project (see the Adaptations section on the next page).

### Expanded Exploration:

Engage students in a discussion about New York City's waste disposal history and methods used today. Why is it important to reduce, reuse, and recycle? What are the benefits and risks of using landfills? If students were going to build their own model landfill, what features would they include?

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Include a **read aloud** component in the warm-up with the **Chapter 2 Introduction**. Review the vocabulary terms and refer to the **Glossary** for definitions.

Follow the Activity instructions.

Ask the students to illustrate and describe how a landfill is made and what it can become over time. Remind them that parks, like Freshkills Park on Staten Island and Battery Park in Manhattan, were once landfills and are now blossoming with trees and flowers.

Alternatively, give them the option of developing an idea for a board game in which something is thrown away and the player chooses where and how the item is disposed of. Encourage the students to share their projects with the class.

### Intermediate:

Follow the Activity instructions, and incorporate a **writing and presentation** component. Have the students invent a city and plan how they would dispose of waste.

- What's the name of your city?
- How many people live in your city?
- What products or natural resources is your city most known for?
- What kinds of recycling laws would you enforce?
- How would you dispose of your city's waste?
- If you choose to transport your city's waste somewhere else, describe the benefits and risks of doing so and how much it will cost financially and environmentally. Remember, transportation uses up fossil fuels, which are nonrenewable natural resources.

Students should present their plans to the class using display boards, a poster, or PowerPoint presentation.

### Advanced:

Follow the Activity instructions and incorporate a **research and presentation** component. Give the students a choice of two writing prompts:

1. Research the environmental benefits and risks of using incinerators and landfills to dispose of waste.
2. What happens when leachate contaminates groundwater?

Students should present their findings to the class using PowerPoint or a display board.

# What Happens to Waste?

## Knowing Where Garbage Goes

### Handout

Name \_\_\_\_\_ Date \_\_\_\_\_

## When You Throw Something Away, Where Does It Go?

Waste that isn't reduced, reused, or recycled is either **incinerated** (burnt to ash) or buried in a **landfill** (a landsite designated for waste burial).

## A Brief History of New York City's Waste

The overwhelming amount of garbage in New York City has been a problem since the late 1700s. In 1798, New York City created its first "Street Commission," workers who walked around the city and disposed of garbage, dirt, and animal waste. They dumped it into swamps, wetlands, and ravines. This waste landfill ended up expanding the waterfront. In fact, more than a quarter of Manhattan south of City Hall was once landfill.



As the city became more populous it became more difficult to keep up with the disposal of all the waste. Deadly diseases, such as, cholera, tuberculosis, and typhus, were widespread. Much of the garbage was dumped at sea, polluting the water and air, and killing wildlife. The city made some efforts to suspend ocean dumping and instituted rules about separating garbage. But it wasn't until 1938 that the Supreme Court ordered New York to stop polluting the sea with its garbage. More landfills were made throughout the five boroughs, but these landfills were not maintained as they should have been and residents complained about the smell and rat infestation.

So, the city decided to develop sanitary landfill procedures, which involve covering and compacting waste with dirt. A modern landfill is like a swimming pool. It's lined at the bottom and sides with plastic and sometimes clay to protect the groundwater from **leachate**, the liquid formed when rainwater mixes with decomposing waste. Most landfills are built with pipes that drain off the leachate where it can be collected and treated. Bulldozers spread the dirt around to help prevent **landfill gas** buildup, which occurs when **organic** (once living) matter decomposes in a landfill. Chemicals are added to cover up the smell, and new soil is added and mixed in with the waste every day.

New York City passed measures in the 1980s requiring residents to sort their waste and recycle certain items, to reduce the amount of waste. The last landfill in New York City, Fresh Kills on Staten Island, was closed in 2001 and is now a beautiful park. Today, New York City's waste is transported to landfills and incinerators outside the city. New York City continues to expand its waste reduction and recycling practices.



# What Happens to Waste?

## Knowing Where Garbage Goes

### Handout

Please respond to the following statements and questions.

1. List all of the possible ways to dispose of waste.
2. What is leachate? Why don't we want it to contaminate the groundwater?
3. What kinds of things can be recycled?
4. Why do we recycle?
5. What kinds of things can be reused?
6. What kinds of things go to landfills or incinerators?
7. What are some of the benefits and drawbacks of transporting waste to landfills and incinerators outside the city?



# What Happens to Waste?

## Making a Modern Sanitary Landfill

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**Time:**

30 minutes

**Subjects:**

English Language Arts, Science

**Vocabulary:**

compacted solid waste,  
earth cover, groundwater,  
landfill, leachate

**Goals and Objectives:**

Students will work together to create models of sanitary landfills and monitor the changes over time. They will record their observations and complete a writing assignment.

**Teacher's Note:**

*The amount of materials you need will depend on how many groups you decide to have.*

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**Materials:**

- Copies of *A Landfill Up Close Handout*
  - Copies of *Making a Modern Sanitary Landfill Handout*
  - **Transparent plastic containers** (could be a large plastic bottle)
  - **Scissors**
  - **Soil** (6" worth per group)
  - **Plastic wrap**
  - **Gravel** or fish tank rocks
  - **Non-recyclable trash** (such as food scraps, used napkins, plastic bags, old rags)
  - **Water**
  - **Plastic tape**
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## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

**Teacher Prep:**

If you are going to use plastic bottles, it may be easier to cut them in half before you distribute them to the student groups.

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of the structure and process of sanitary landfills.

**Suggested Discussion:** Distribute copies of *A Landfill Up Close Handout* and go over the various parts of a landfill. What are landfills made of? How is waste added to them?

## Exploration:

1. Divide the class into small groups and distribute copies of ***Making a Modern Sanitary Landfill Handout*** so each group has a set of instructions.
2. Distribute the transparent plastic containers, one to each group. Be sure that the plastic container can be sealed and made airtight. If you're using a plastic bottle, cut the bottle in half and keep the top half, which will be secured later with tape.
3. First, place a 1" – 2" layer of soil to represent the ground under all landfills.
4. Spread the plastic wrap over the soil. This represents the plastic layer of liner, which prevents leachate from leaking into the groundwater.
5. Add a layer of gravel. This represents the gravel that landfills use to allow leachate to drain out.
6. Spread some of the waste items on top of the layer of gravel. Keep in mind that bulldozers spread the waste evenly in a real landfill. Place some of the waste items close to the container's sides so the group can observe the decomposition process.
7. Add a layer of soil.
8. Alternate layers of waste and soil, three times each.
9. Occasionally sprinkle water on the landfill to represent rainwater.
10. Secure the top portion of the container firmly with tape so that it is airtight.
11. Let air and water in for a few moments every two to three days.
12. Encourage the students to record their observations (can use the backside of ***Making a Modern Sanitary Landfill Handout*** for this purpose).

## Expanded Exploration:

Engage students in a discussion about real landfills and how long it takes for materials to decompose. Ask them where they think their school's waste goes and how long it takes for it to decompose.



# Adaptations for Different Grades

Choose level most appropriate for your class.

## Beginner:

Follow the Activity instructions.

Encourage each group to illustrate the changes in their landfills (can use the backside of **Making a Modern Sanitary Landfill Handout** for this purpose) and share their landfill's progress with the class.

## Intermediate:

Follow the Activity instructions and have each student record the changes (can use the backside of **Making a Modern Sanitary Landfill Handout** for this purpose) and write a summary report of this project. Each group should present their findings to the class using a display board or PowerPoint and should address how their models are similar and different to real landfills.

## Advanced:

Follow the Activity instructions.

Ask each group to address the following questions in a written paper and class presentation:

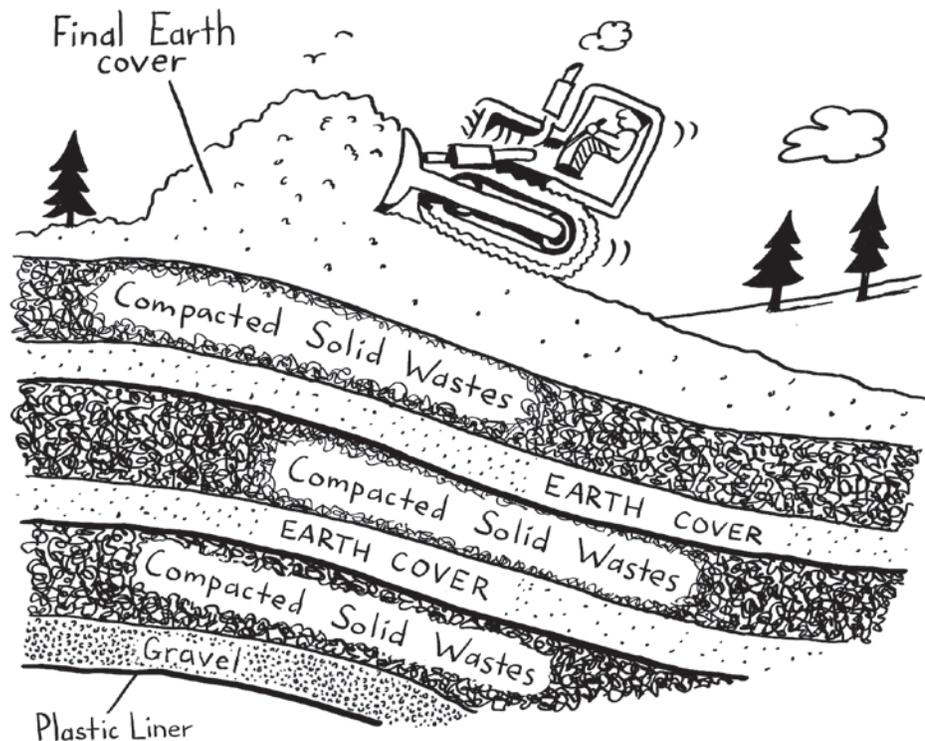
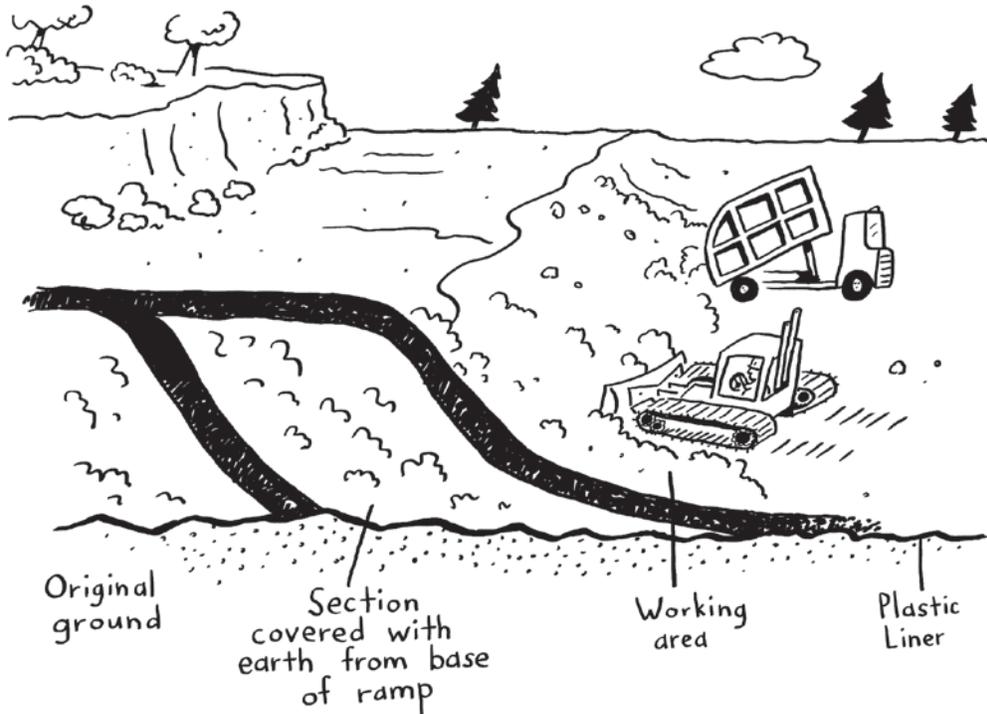
1. How is your model similar to a real landfill? How is it different?
2. How long did it take for some of the waste in your landfill to decompose beyond recognition?
3. Did layers closer to the top decompose faster or slower than layers closer to the bottom?
4. What variables contribute to the rate of decomposition?





# What Happens to Waste?

## A Landfill Up Close Handout





# What Happens to Waste?

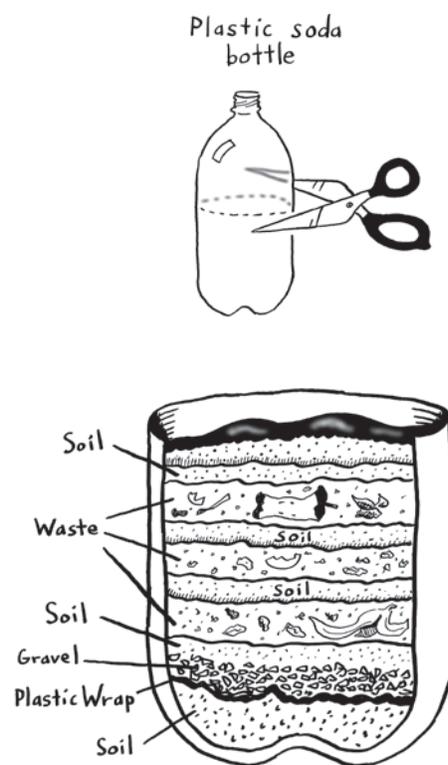
## Making a Modern Sanitary Landfill Handout

### Materials:

- **Transparent plastic container** (large plastic bottle with cap, or see-through plastic box with lid)
- **Scissors**
- **Soil** (4" – 6" worth per group)
- **Plastic wrap**
- **Gravel** or fish tank rocks (1 cup per group)
- **Non-recyclable trash** (such as food scraps, used napkins, plastic bags, old rags)
- **Water**
- **Plastic tape**
- **Observation journals**

### Instructions:

1. Use a see-through container so you can watch the progress of what's inside your mini-landfill.
2. If you're using a bottle or jug, cut the bottle in half, keeping the top portion and cap. If it's a plastic box, make sure it can be closed airtight.
3. Put in a 1" – 2" layer of soil, which is like the ground under all landfills.
4. Spread the plastic wrap over the soil. This represents the liner found in a sanitary landfill which keeps the leachate from leaking out from the landfill into the groundwater.
5. Add a layer of gravel. This represents the gravel used in landfills to allow leachate to drain away.
6. Evenly spread some of the waste items collected onto the gravel. Bulldozers spread the waste this way in a real landfill. Make sure some of the waste items are close to the transparent container's sides so you can watch the decomposition process.
7. Add a layer of soil.
8. Alternate waste and soil layers three times each.
9. Occasionally sprinkle water on the landfill to represent rainwater.
10. Replace the top portion of the bottle, securing it tightly with tape. If you're using a plastic container, put the top back on. Make sure the container's top is airtight to keep it from smelling.
11. Every 2 – 3 days, unscrew the cap (or open the lid if you're using a container) for a few moments to let air in, and water lightly. Be careful not to spill any of your landfill's contents!!



# Tracking What Happens to the Waste in Your Mini-Landfill

Now that you have made a mini-landfill, track what is happening to the waste that is buried inside.

Date	Draw or Write Your Observations

# What Happens to Waste?

## Where Does School Trash Go?

**Time:**

30 – 45 minutes

**Goals and Objectives:**

Students will investigate and write about your school's system for waste disposal.

**Subjects:**

English Language Arts, Science

**Teacher's Note:**

*This Activity is most effective if students are given an opportunity to interview the school's custodial and sustainability staff. You may want to include the students' findings on your class website. This Activity can be done in conjunction with these other Activities: **Chapter 3, Activity 1: Recycling in the Classroom** and **Chapter 4, Activity 2: Getting Your School to Be a Super Recycler.***

**Vocabulary:**

custodian, recycle, reduce, reuse, Sustainability Coordinator

**Materials:**

- Class **website** (optional)
- **Internet access** and staff for research

## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of where school trash goes.

**Suggested Discussion:** Where do you think school trash goes? What kind of waste disposal system does your school practice?

**Exploration:**

1. Ask the students to investigate the following questions by researching information on the Internet and interviewing school staff:
  - How much trash does each class make each day?
  - How much does the whole school produce in a week?
  - Who is responsible for waste disposal and what specifically do these staff members do?
  - What is the role of the custodian?
  - What is the role of the Sustainability Coordinator?
  - What is the role of each student?
  - How often is the garbage picked up?

- How often are the recyclables picked up? Who picks them up?
  - What time of day do these trucks pick up the recyclables?
  - Do different trucks pick up different types of recyclables? If so, describe what they look like, how often they pick up recyclables, and how recyclables should be bagged.
2. After they have gathered information from their research and quotes from their interviews, have the students compose articles that summarize their findings. They should also include at least one illustration, hand-drawn or printed, with their articles.
  3. If you have already set up a class website, students can publish their articles online. If you do not have one and choose not to set one up, you can have students either compile a newsletter of the articles or have each student present their articles to the class.

### Expanded Exploration:

Engage students in a discussion about what happens to their waste after it is collected at the curb. Where does it go? Does it all go to one place? Or do trash and recyclables go to different places?

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Include a **read aloud** component by having students read each other's articles.

### Intermediate:

Follow the Activity instructions.

Encourage the students to come up with their own related questions to investigate; have them work in teams to present a series of interlinked articles to the class.

Students can work in small groups to present a video or live news presentations of their findings to the class.

### Advanced:

Follow the Activity instructions.

Have the students work in teams, using their articles to develop either a documentary video or a live informational presentation for an audience of new students. Each group presents their project to the class.

## What Happens to Waste?

# Exploring How Long It Takes for Basic Materials to Decompose

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**Time:**

30 minutes

**Subjects:**

English Language Arts, Science

**Vocabulary:**

biodegradable, decompose, decomposition

**Goals and Objectives:**

Students will learn about how long it takes for certain materials to decompose and see what impact the materials they use have on the environment.

**Teacher's Note:**

*If possible, bring in some of the items listed on the **Decomposition Flashcards**.*

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**Materials:**

- Copies of **Decomposition Worksheet**
  - **Decomposition Timeline**
  - Copies of **Decomposition Flashcards**
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## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of how long it takes for basic materials to decompose.

**Suggested Discussion:** What is decomposition? What happens to our garbage when we throw it away?

**Exploration:**

1. Distribute copies of the **Decomposition Worksheet**.
2. Shuffle the **Decomposition Flashcards** and deal one to every student or group of students. If available, give each student or group the actual item that matches their flashcard.
3. Every student should write down a guess for every item on their **Decomposition Worksheet**. If working in groups, have them discuss their reasoning and decide on an answer together.
4. Have students (or a representative from each group) stand and line up in sequence according to how long they think it takes their item to decompose. Each student should present a case for their item.

5. Referring to the **Decomposition Timeline**, reveal the correct answers one by one, and that student immediately moves to the proper sequence in the line. By the end of this Activity, students are standing in the proper Decomposition order.
6. Have students discuss and answer the questions listed on the back of their **Decomposition Worksheet**.

### Expanded Exploration:

To easily add a creative project-based component to the Activity, give every student a tile, colored note-card, or another reused item. On the tile have the students write the name of the item, draw a small sketch of it, and write how long the item takes to decompose. Then use glue or 2-sided tape to adhere the tiles to a board or an existing frame.

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Follow the Activity instructions.

Ask each pair of students to create a poster that illustrates the amount of time it takes for certain materials to decompose. Encourage them to share their posters with the class and display them throughout the school.

### Intermediate:

Follow the Activity instructions.

Have the students work in small groups. Give them the choice between making a group PSA (public service announcements poster) or a sculpture that reuses some classroom waste items. Ask them to share their projects with the class.

### Advanced:

Follow the Activity instructions.

Have students make a digital **Decomposition Timeline** using computers. Students can research various decomposition rates for specific items and insert photos and information about them into a presentation.





# What Happens to Waste?

## Decomposition Worksheet

Name \_\_\_\_\_ Date \_\_\_\_\_

Why will some of the items last a long time in the environment?

Why won't the plastic items ever really decompose?

Is it okay to litter any of the items? Why?

What happens when items are put in a landfill and not exposed to air? How does this affect decomposition?

What items could be reused or recycled?

# What Happens to Waste?

## Decomposition Flashcards

<b>Loose-leaf paper</b> 	<b>Banana peel</b> 	<b>Cotton t-shirt</b> 	<b>Wool sock</b> 
<b>Milk carton</b> 	<b>Paper Plate</b> 	<b>Plastic garbage bag</b> 	<b>Painted wood</b> 
<b>Nylon fabric</b> 	<b>Rubber boot sole</b> 	<b>Steel can</b> 	<b>Plastic cup</b> 
<b>Aluminum can</b> 	<b>Plastic six-pack holder</b> 	<b>Glass bottle</b> 	<b>Plastic bottle</b> 

## What Happens to Waste?

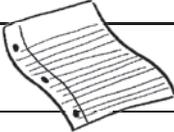
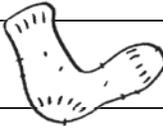
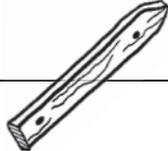
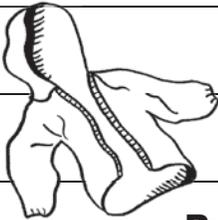
# Decomposition Flashcards

<p><b>Guess how long it takes this item to decompose.</b></p>	<p><b>Guess how long it takes this item to decompose.</b></p>	<p><b>Guess how long it takes this item to decompose.</b></p>	<p><b>Guess how long it takes this item to decompose.</b></p>
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# What Happens to Waste?

## Decomposition Timeline

This item... ..takes this long to decompose when exposed to air.

	<b>Loose-leaf paper</b>	<b>2 - 4 weeks</b>	
	<b>Banana peel</b>	<b>2 - 5 weeks</b>	
	<b>Cotton t-shirt</b>	<b>1 - 5 months</b>	
	<b>Wool sock</b>	<b>1 year</b>	
	<b>Milk carton</b>	<b>5 years</b>	
	<b>Paper plate</b>	<b>5 years</b>	
	<b>Plastic garbage bag</b>	<b>10 - 20 years</b>	
	<b>Painted wood</b>	<b>13 years</b>	
	<b>Nylon fabric</b>	<b>30 - 40 years</b>	
	<b>Rubber boot sole</b>	<b>50 - 80 years</b>	
	<b>Steel can</b>	<b>100 years</b>	
	<b>Plastic cup</b>	<b>250 years</b>	
	<b>Aluminum can</b>	<b>200 - 500 years</b>	
	<b>Plastic six-pack holder</b>	<b>450 years</b>	
	<b>Glass bottle</b>	<b>unknown</b>	
	<b>Plastic bottle</b>	<b>unknown</b>	



## What Happens to Waste?

# Banana Breakdown

### Time:

20 minutes

### Subjects:

English Language Arts, Science

### Vocabulary:

decay, decompose,  
decomposition, organic

### Goals and Objectives:

Students will study the process of decomposition and apply the knowledge to decisions they make about their own waste. They will gain hands-on experience implementing the Scientific Method as they observe a banana peel decaying in six different conditions (water, soil, with and without sunlight, with and without oxygen), and complete a writing assignment.

### Materials:

- Six **banana peels**
- Six **jars** or resealable plastic bags
- **Water**
- Copies of ***Banana Breakdown Handout***

## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

### Warm Up:

**Class Discussion:** Determine students' prior knowledge and understanding of how organic materials decompose.

**Suggested Discussion:** What happens to garbage after you throw it away? What variables impact the rate of decomposition or decay?



### Exploration:

1. Distribute copies of ***Banana Breakdown Handout***.
2. **Questions/Predictions:** Do banana peels decompose faster in light or darkness? Do they decompose faster in a dry or wet environment? Do they decompose faster when exposed to oxygen or without oxygen?
3. Ask the students to write their predictions or hypotheses on ***Banana Breakdown Handout***.
4. Divide the class into six groups and assign each group one variable to test: sunlight/darkness, water/soil, oxygen/no oxygen.

**5. Procedure:** Each group will place their banana peel in a jar or resealable bag and create the condition that is being tested.

**Light/Darkness:** Place one container near a window and place the other in a drawer or closet or a similar place without light.

**Wet/Dry:** Add water to one container and leave the other container dry.

**Oxygen/No Oxygen:** Seal one container and leave the other unsealed.

**6.** Every few days, have the students record the changes they observe. They should note the date, draw and describe their observations.

**7.** After all of the banana peels have decomposed, have each group present their observations to the class.

**8. Conclusions:** Have the class compare all of the results. Each student should write an overall conclusion and complete a follow-up writing assignment (see Adaptations for different levels).

### Expanded Exploration:

Engage students in a discussion about their conclusions and how this can lead to strategies for organic waste disposal.

- What are some ways people can dispose of vegetarian food scraps?
- Would food scraps decompose faster in a compost heap or in a landfill?
- Encourage them to imagine how long it takes for other materials to decompose in a landfill, where light and oxygen are limited.
- Applying what they have learned about environmental conditions and their impact on decomposition, what do they predict will be the decomposition rate for waste littered in a river?



# Adaptations for Different Grades

*Choose level most appropriate for your class.*

## Beginner:

Follow the Activity instructions.

Review the meanings of the vocabulary terms and refer to the **Glossary** for definitions. Explain the elements of a scientific experiment in context of testing the impacts of various conditions on the decomposition rate of a banana peel. When the experiment has been completed, have the students create how-to books that illustrate and describe the steps of the experiment. They should present their books to the class.

## Intermediate:

Follow the Activity instructions and include a **writing** component in which they implement the Scientific Method. Students should present their hypotheses, ideas for analysis, and final conclusions to the class.

### Possible Hypotheses:

- Light will/will not make a banana peel decay faster.
- Water will/will not make a banana peel decay faster.
- Oxygen will/will not make a banana peel decay faster.

### Possible Analysis and Conclusions:

- How did the banana peel change during the week?
- What conditions made the banana peel decay faster?
- What conditions made the banana peel decay more slowly?

## Advanced:

Follow the Activity instructions.

Students should write a formal report of their observations and the overall class findings, implementing the Scientific Method. Each group should present their results and conclusions to the class using photography, PowerPoint, and/or a display board.



# What Happens to Waste?

## Banana Breakdown Handout

Name \_\_\_\_\_ Date \_\_\_\_\_

Please answer the following questions.

### Part 1: Questions and Predictions

1. Do you think banana peels will decompose faster in light or darkness?



2. Do you think banana peels will decompose faster in a dry or wet environment?



3. Do you think banana peels will decompose faster when exposed to oxygen or without oxygen?



### Part 2: Procedure

1. Which variable will your team test: sunlight/darkness, water/soil, oxygen/no oxygen?

2. Describe how your team plans to test the variable that you were assigned.

3. Check the box that applies to your team's experiment:

- Light/Darkness:** Place one container near a window; place the other in a drawer or closet, or a similar place without light.
- Wet/Dry:** Add water to one container; leave the other container dry.
- Oxygen/No Oxygen:** Seal one container; leave the other unsealed.

### Part 3: Observations

Please note the date and write a brief description of your observations.

Date	Description

### Part 4: Conclusions

1. How long did it take for your team’s banana peel to decompose?
2. Which variables sped up the decomposition process?
3. Which variables slowed down the decomposition?

## What Happens to Waste?

# Litter in a River Experiment

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**Time:**

20 minutes

**Subjects:**

English Language Arts, Science

**Goals and Objectives:**

Students will create a model of a river and observe what happens to the water when trash is added. They will complete a writing assignment that examines how this experiment represents what happens to rivers and the sea when they become littered with trash.

**Vocabulary:**

contamination, decomposition, ecosystem, litter, pollution

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**Materials:**

- A large **jar** or glass bowl
  - **Sand, stones,** or other naturally present objects
  - **Small pieces of litter:** fruit rinds, nails, newspaper, plastic wrap, fabric
  - **Water**
  - Copies of *Litter in a River Handout*
- 

## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of the effects of litter on rivers and the sea.

**Suggested Discussion:** What happens to bodies of water when they become littered with trash? How does this contamination impact us?

**Exploration:**

1. Fill a large clear jar or glass bowl with water. Explain to the class that this represents a river or the sea.
2. You may want to add stones, sand, or other items that might naturally be present.
3. Invite the class to add small pieces of trash to the water.
4. Distribute copies of *Litter in a River Handout*.
5. Have the class write down the date and describe the littered water.

6. Leave the container alone and uncovered for a couple of weeks.
7. Ask the class to record the changes they observe over time on the ***Litter in a River Handout***.

### Expanded Exploration:

Engage the students in a discussion about the impacts of litter on the environment. Ask them to describe what happened to the water in their experiment and to imagine what would happen to the plants and animals that live in the water. Would they want to drink or swim in the water? How can students help reduce litter? How can they help their school or neighborhood community cut down on litter?

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Follow the Activity instructions.

Review the vocabulary words and refer to the **Glossary** for definitions. Encourage the students to illustrate and describe on a poster the changes they observed in the experiment.

### Intermediate:

Follow the Activity instructions and assign a research project that applies their observations to actual cases of water pollution. Students should write articles about their findings and present their articles to the class.

### Advanced:

Follow the Activity instructions and incorporate a research project about the long-term impact of water pollution on ecosystems. The articles should also include solutions, ways of managing water pollution, and strategies for decontaminating the water. They can present their articles to the class.



# What Happens to Waste?

## Litter in a River Handout

Name \_\_\_\_\_ Date \_\_\_\_\_

1. Write a description of and illustrate the container filled with clean water.
2. Describe and illustrate the trash that was added to the container.
3. What does the water look like one week later? Please include the date and a description of the litter and the water in your answer.
4. What does the water look like two weeks after the trash was added? Please include the date and description of the litter and water in your answer.
5. What happens to bodies of water when they become littered with trash?
6. How does this contamination impact plant life, animals, and people?



# What Happens to Waste?

## Studying Litter in the School Community

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**Time:**

45 minutes

**Subjects:**

English Language Arts, Science

**Vocabulary:**

litter, recycle, reduce, reuse

**Goals and Objectives:**

Students will explore the school grounds and record on **Litter in the School Community Handout** how much litter they find. They will properly dispose of the waste. They will analyze their findings and write essays that propose strategies to reduce the amount of litter.

**Teacher's Note:**

*This Activity can be done in conjunction with **Chapter 4, Activity 7: Litter Awareness Campaign**.*

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**Materials:**

- Clear bags for collecting litter
  - Copies of **Litter in the School Community Handout**
  - Gloves
- 

## Activity

*Following this Activity are adaptations for Beginner, Intermediate, and Advanced.*

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of litter and how much litter they think accumulates around the school each day and each week.

**Suggested Discussion:** Do you think there's a lot of litter around the school? Where do you think most of it occurs? Why do people litter?

**Exploration:**

1. Distribute copies of **Litter in the School Community Handout** and clear bags to collect litter.
2. Have the students work in pairs or small groups.
3. **Caution against picking up dangerous items, including needles or shards of glass.** But let them know that they should document everything.
4. They will search for litter inside the school building and outside on the school grounds for 20 – 30 minutes, and record their findings on **Litter in the School Community Handout**. The students will collect and properly dispose of any litter that they find, placing garbage in one bag, and recyclables in two separate bags for paper and for metal, glass, plastic, foil, and cartons. Any dangerous items should be left where they are, and reported to the custodian or Principal.

5. When they return to class, discuss any patterns that the students noticed. Were there specific areas of the property that seemed to have more litter than others? Here are some other questions to discuss:
- How many items of litter did they find in total?
  - How many metal items did they find?
  - How many glass items did they find?
  - How many plastic items did they find?
  - How many paper items did they find?
  - How many cloth items did they find?
  - How many food waste items did they find?
  - What else did they find?
  - Did they find more litter indoors or outdoors?
  - Why do they think people litter?
  - What are some ideas they have about reducing litter?

### Expanded Exploration:

Engage the students in a discussion about how they can encourage people to stop littering. Why do they think people litter? What are some ideas the school community could implement in order to reduce the amount of litter? Let them know that the Department of Sanitation offers a program to encourage volunteer clean-ups, providing bags, gloves, and tools. More information can be found on the New York City Department of Sanitation website ([nyc.gov/sanitation](https://nyc.gov/sanitation)) or by calling 311.

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Follow the Activity instructions.

Instead of having the students work in pairs, you may want to lead the entire class in the school grounds exploration. Encourage the students to create cartoon posters that incorporate their findings and a plan to reduce litter in the school community. They can share their work with the class.

### Intermediate:

Follow the Activity instructions.

Have the students make posters that illustrate ways to properly discard waste in garbage or recycling bins and why reducing litter is important. Encourage the students to present their posters to the class and display them around the school.

### Advanced:

Follow the Activity instructions and incorporate an **applied research** component. Ask the students to use their findings to estimate how much litter is created each day, week, and month. How many of the items could be reused or recycled? Students should share their research essays with the class and the larger school community.

# What Happens to Waste?

## Litter in the School Community Handout

Name \_\_\_\_\_ Date \_\_\_\_\_

List the items you found on the school grounds.

Items	Indoors	Outdoors

Where did you find the most litter?

Why do you think there was so much litter?

Please tally the number of items you found according to material type

Metal	Glass	Plastic	Paper	Cloth	Food Scraps	Other

What are some ideas you have about how your school community can reduce the amount of litter?



# What Happens to Waste?

## Learning Standards

### Activity 1: Knowing Where Garbage Goes After It's Thrown Away

#### **New York State Common Core Learning Standards for English Language Arts & Literacy**

##### **College and Career Readiness Anchor Standards for Reading**

- Subsections 1, 2     Key Ideas and Details
- Subsection 4         Craft and Structure

##### **College and Career Readiness Anchor Standards for Writing**

- Subsections 1, 2, 3   Text Types and Purposes
- Subsections 4, 6     Production and Distribution of Writing
- Subsection 7         Research to Build and Present Knowledge

##### **College and Career Readiness Anchor Standards for Speaking and Listening**

- Subsections 1, 2     Comprehension and Collaboration
- Subsections 4, 6     Presentation of Knowledge and Ideas

##### **College and Career Readiness Anchor Standards for Language**

- Subsections 1, 2     Conventions of Standard English
- Subsection 3         Knowledge of Language
- Subsection 6         Vocabulary Acquisition and Use

#### **The Applied Learning Performance Standards**

- A2     Communication Tools and Techniques
- A5     Tools and Techniques for Working With Others

#### **New York City Science Scope & Sequence**

##### **7.1a, 7.1b**

Human influences on the environment: positive influences.

##### **7.1c, 7.2a, 7.2b, 7.2c**

Human influences on the environment: negative influences.

##### **7.3a, 7.3b**

Human influences on the environment: decision making (risk/benefit).

#### **LE 3.2b, LE 7.1e, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1**

Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation; global warming; ozone depletion; acid rain; air pollution; water pollution; impact on other organisms.

#### **LE 5.1d,e, LE 6.1 a,b**

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).

#### **LE 6.1c, ICT 5.1, 5.2**

Renewable and nonrenewable sources of materials.

#### **LE 7.1a,b**

Describe the way that humans: depend on their natural and constructed environment; have changed their environment over time.

#### **LE 7.1b,c**

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

#### **LE 7.2b,c, LE 7.2d**

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

#### **LE 7.2b,c, LE 7.2d**

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

#### **LE 7.2c,d, ICT 5.2, IPS 1.1-1.4, IPS 2.1**

Water issues: depletion; pollution.

#### **LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1**

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

#### **S1.1a,b,c**

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.

# What Happens to Waste?

## Learning Standards

### Activity 2: Making a Modern Sanitary Landfill

#### New York State Common Core Learning Standards for English Language Arts & Literacy

##### College and Career Readiness Anchor Standards for Writing

Subsection 2	Text Types and Purposes
Subsection 4	Production and Distribution of Writing
Subsection 7	Research to Build and Present Knowledge

##### College and Career Readiness Anchor Standards for Speaking and Listening

Subsections 4, 6	Presentation of Knowledge and Ideas
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##### College and Career Readiness Anchor Standards for Language

Subsections 1, 2	Conventions of Standard English
Subsection 3	Knowledge of Language

#### The Applied Learning Performance Standards

A2	Communication Tools and Techniques
A5	Tools and Techniques for Working With Others

#### New York City Science Scope & Sequence

##### 7.1a, 7.1b

Human influences on the environment: positive influences.

##### 7.1c, 7.2a, 7.2b, 7.2c

Human influences on the environment: negative influences.

##### 7.3a, 7.3b

Human influences on the environment: decision making (risk/benefit).

##### ICT 5.2, IPS 1.1-1.4, IPS 2.1

Packaging and solid waste.

##### LE 3.2b, LE 7.1e, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1

Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation; global warming; ozone depletion; acid rain; air pollution; water pollution; impact on other organisms.

##### LE 5.1d,e, LE 6.1 a,b

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).

##### LE 6.1c, ICT 5.1, 5.2

Renewable and nonrenewable sources of materials.

##### LE 7.1a,b

Describe the way that humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.1b,c

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2b,c, LE 7.2d

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.2b,c, LE 7.2d

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2c,d, ICT 5.2, IPS 1.1-1.4, IPS 2.1

Water issues: depletion; pollution.

##### LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

##### PS 3.1b,c

Observe and describe physical properties of objects using all of the appropriate senses: size, shape, texture, weight, color, etc. Determine whether objects are alike or different.

##### S1.1a,b,c

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.

##### Standard 1-1.1a, 1.1b, 1.1c, 3.1, 3.2, 3.3

The role of scientific inquiry in studying biology.

##### Standards 1-1.2a, 1.2b, 1.3a, 1.3b, 2.1, 2.2, 2.3a, 2.3b, 2.3c, 2.4, 3.4a, 3.4b, 3.4c, 3.5a, 3.5b

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# What Happens to Waste?

## Learning Standards

### Activity 3: Where Does School Trash Go?

#### **New York State Common Core Learning Standards for English Language Arts & Literacy**

##### **College and Career Readiness Anchor Standards for Reading**

Subsection 1 Key Ideas and Details

##### **College and Career Readiness Anchor Standards for Writing**

Subsections 1, 2, 3 Text Types and Purposes

Subsections 4, 5, 6 Production and Distribution of Writing

Subsections 7, 8, 9 Research to Build and Present Knowledge

##### **College and Career Readiness Anchor Standards for Speaking and Listening**

Subsections 1, 2 Comprehension and Collaboration

Subsections 4, 6 Presentation of Knowledge and Ideas

##### **College and Career Readiness Anchor Standards for Language**

Subsections 1, 2 Conventions of Standard English

Subsection 3 Knowledge of Language

#### **The Applied Learning Performance Standards**

A2 Communication Tools and Techniques

A3 Information Tools and Techniques

A5 Tools and Techniques for Working With Others

#### **New York City Science Scope & Sequence**

##### **7.1a, 7.1b**

Human influences on the environment: positive influences.

##### **7.1c, 7.2a, 7.2b, 7.2c**

Human influences on the environment: negative influences.

##### **7.3a, 7.3b**

Human influences on the environment: decision making (risk/benefit).

##### **ICT 5.2, IPS 1.1-1.4, IPS 2.1**

Packaging and solid waste.

##### **LE 3.2b, LE 7.1e, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1**

Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation; global warming; ozone depletion; acid rain; air pollution; water pollution; impact on other organisms.

##### **LE 5.1d,e, LE 6.1 a,b**

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).

##### **LE 6.1c, ICT 5.1, 5.2**

Renewable and nonrenewable sources of materials.

##### **LE 7.2b,c, LE 7.2d**

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

##### **LE 7.2b,c, LE 7.2d**

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### **LE 7.2c,d, ICT 5.2, IPS 1.1-1.4, IPS 2.1**

Water issues: depletion; pollution.

##### **LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1**

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

# What Happens to Waste?

## Learning Standards

### Activity 4: Exploring How Long It Takes for Basic Materials to Decompose

#### New York State Common Core Learning Standards for English Language Arts & Literacy

##### College and Career Readiness Anchor Standards for Reading

Subsection 1 Key Ideas and Details

##### College and Career Readiness Anchor Standards for Writing

Subsection 2 Text Types and Purposes

Subsection 4 Production and Distribution of Writing

##### College and Career Readiness Anchor Standards for Speaking and Listening

Subsection 1 Comprehension and Collaboration

Subsections 4, 6 Presentation of Knowledge and Ideas

##### College and Career Readiness Anchor Standards for Language

Subsections 1, 2 Conventions of Standard English

#### The Applied Learning Performance Standards

A2 Communication Tools and Techniques

A5 Tools and Techniques for Working With Others

#### New York City Science Scope & Sequence

##### 7.1a, 7.1b

Human influences on the environment: positive influences.

##### 7.1c, 7.2a, 7.2b, 7.2c

Human influences on the environment: negative influences.

##### 7.3a, 7.3b

Human influences on the environment: decision making (risk/benefit).

##### ICT 5.2, IPS 1.1-1.4, IPS 2.1

Packaging and solid waste.

##### LE 3.2b, LE 7.1e, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1

Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation; global warming; ozone depletion; acid rain; air pollution; water pollution; impact on other organisms.

##### LE 6.1c, ICT 5.1, 5.2

Renewable and nonrenewable sources of materials.

##### LE 7.1a,b

Describe the way that humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.1b,c

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2b,c, LE 7.2d

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.2b,c, LE 7.2d

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2c,d, ICT 5.2, IPS 1.1-1.4, IPS 2.1

Water issues: depletion; pollution.

##### LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

##### PS 3.1b,c

Observe and describe physical properties of objects using all of the appropriate senses: size, shape, texture, weight, color, etc. Determine whether objects are alike or different.

##### S1.1a,b,c

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.

# What Happens to Waste?

## Learning Standards

### Activity 5: Banana Breakdown

#### **New York State Common Core Learning Standards for English Language Arts & Literacy**

##### **College and Career Readiness Anchor Standards for Writing**

Subsection 2	Text Types and Purposes
Subsection 4	Production and Distribution of Writing

##### **College and Career Readiness Anchor Standards for Speaking and Listening**

Subsections 1, 2	Comprehension and Collaboration
Subsections 4, 6	Presentation of Knowledge and Ideas

##### **College and Career Readiness Anchor Standards for Language**

Subsections 1, 2	Conventions of Standard English
Subsection 3	Knowledge of Language
Subsection 6	Vocabulary Acquisition and Use

#### **The Applied Learning Performance Standards**

A2	Communication Tools and Techniques
A5	Tools and Techniques for Working With Others

#### **New York City Science Scope & Sequence**

##### **7.1 a, 7.1b**

Human influences on the environment: positive influences.

##### **7.1c, 7.2a, 7.2b, 7.2c**

Human influences on the environment: negative influences.

##### **7.3a, 7.3b**

Human influences on the environment: decision making (risk/benefit).

##### **LE 5.1d,e, LE 6.1 a,b**

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).

##### **LE 7.1a,b**

Describe the way that humans: depend on their natural and constructed environment; have changed their environment over time.

##### **LE 7.1b,c**

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### **LE 7.2b,c, LE 7.2d**

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

##### **LE 7.2b,c, LE 7.2d**

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### **LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1**

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

##### **PS 3.1b,c**

Observe and describe physical properties of objects using all of the appropriate senses: size, shape, texture, weight, color, etc. Determine whether objects are alike or different.

##### **S1.1a,b,c**

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.

##### **Standard 1–1.2a, 1.2b, 1.3a, 1.3b, 2.1, 2.2, 2.3a, 2.3b, 2.3c, 2.4, 3.4a, 3.4b, 3.4c, 3.5a, 3.5b**

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# What Happens to Waste?

## Learning Standards

### Activity 6: Litter in a River Experiment

#### New York State Common Core Learning Standards for English Language Arts & Literacy

##### College and Career Readiness Anchor Standards for Reading

Subsections 1, 2 Key Ideas and Details

##### College and Career Readiness Anchor Standards for Writing

Subsections 2, 3 Text Types and Purposes

Subsection 4 Production and Distribution of Writing

Subsections 7, 9 Research to Build Present Knowledge

##### College and Career Readiness Anchor Standards for Speaking and Listening

Subsection 2 Comprehension and Collaboration

Subsections 4, 6 Presentation of Knowledge and Ideas

##### College and Career Readiness Anchor Standards for Language

Subsections 1, 2 Conventions of Standard English

Subsection 3 Knowledge of Language

Subsection 6 Vocabulary Acquisition and Use

#### The Applied Learning Performance Standards

A2 Communication Tools and Techniques

A5 Tools and Techniques for Working With Others

#### New York City Science Scope & Sequence

##### 7.1c, 7.2a, 7.2b, 7.2c

Human influences on the environment: negative influences.

##### 7.3a, 7.3b

Human influences on the environment: decision making (risk/benefit).

##### ICT 5.2, IPS 1.1-1.4, IPS 2.1

Packaging and solid waste.

##### LE 3.2b, LE 7.1e, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1

Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation; global warming; ozone depletion; acid rain; air pollution; water pollution; impact on other organisms.

##### LE 5.1d,e, LE 6.1 a,b

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).

##### LE 7.1a,b

Describe the way that humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.1b,c

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2b,c, LE 7.2d

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.2b,c, LE 7.2d

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2c,d, ICT 5.2, IPS 1.1-1.4, IPS 2.1

Water issues: depletion; pollution.

##### LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

##### PS 3.1b,c

Observe and describe physical properties of objects using all of the appropriate senses: size, shape, texture, weight, color, etc. Determine whether objects are alike or different.

##### S1.1a,b,c

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.

# What Happens to Waste?

## Learning Standards

### Activity 7: Studying Litter in the School Community

#### New York State Common Core Learning Standards for English Language Arts & Literacy

##### College and Career Readiness Anchor Standards for Writing

Subsections 2, 3	Text Types and Purposes
Subsection 4	Production and Distribution of Writing
Subsections 7, 9	Research to Build Present Knowledge

##### College and Career Readiness Anchor Standards for Speaking and Listening

Subsection 2	Comprehension and Collaboration
Subsections 4, 6	Presentation of Knowledge and Ideas

##### College and Career Readiness Anchor Standards for Language

Subsections 1, 2	Conventions of Standard English
Subsection 3	Knowledge of Language
Subsection 6	Vocabulary Acquisition and Use

#### The Applied Learning Performance Standards

A2	Communication Tools and Techniques
A5	Tools and Techniques for Working With Others

#### New York City Science Scope & Sequence

##### 7.1 a, 7.1b

Human influences on the environment: positive influences.

##### 7.1c, 7.2a, 7.2b, 7.2c

Human influences on the environment: negative influences.

##### 7.3a, 7.3b

Human influences on the environment: decision making (risk/benefit).

##### ICT 5.2, IPS 1.1-1.4, IPS 2.1

Packaging and solid waste.

##### LE 3.2b, LE 7.1e, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1

Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation; global warming; ozone depletion; acid rain; air pollution; water pollution; impact on other organisms.

##### LE 5.1d,e, LE 6.1 a,b

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).

##### LE 6.1c, ICT 5.1, 5.2

Renewable and nonrenewable sources of materials.

##### LE 7.1a,b

Describe the way that humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.1b,c

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2b,c, LE 7.2d

Describe the way humans: depend on their natural and constructed environment; have changed their environment over time.

##### LE 7.2b,c, LE 7.2d

Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).

##### LE 7.2c,d, ICT 5.2, IPS 1.1-1.4, IPS 2.1

Water issues: depletion; pollution.

##### LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1

Environmental toxins: pesticides and herbicides; fertilizers; organic waste.

##### PS 3.1b,c

Observe and describe physical properties of objects using all of the appropriate senses: size, shape, texture, weight, color, etc. Determine whether objects are alike or different.

##### S1.1a,b,c

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.

