

# Chapter 1

## What Is Waste?



### Chapter Focus:

The Activities in this chapter are designed to help students talk about waste by looking at how much we throw away, and what's in our waste.

## What Is Waste?

Waste is any material that we no longer find useful and want to throw away. Different cultures and even different people have varying ideas about what is waste. One person might find a hundred uses for something that another person would throw away after using only once.

You can think of waste as the by-product that results from all of our daily activities, from making breakfast to playing soccer. What we do with these by-products — whether we find new uses for them through recycling, or “get rid of them” by burying or burning them — has a big impact on the environment.

## What Makes Up Our Waste?

Much of what we consider waste — such as various kinds of containers and packaging — contains substances that have been made from the earth's raw materials. These substances are called **natural resources** and are divided into two categories: **renewable** resources and **nonrenewable** resources.

**Renewable Resources:** Raw materials that can be replenished are considered renewable resources. An example of a renewable resource is the wood from trees that is used to make paper. After a tree is cut down, a new tree can be planted in its place.

**Nonrenewable Resources:** Resources that are limited in supply are referred to as nonrenewable resources. The steel used to make metal cans is considered a nonrenewable resource because once iron is mined it cannot readily be replenished.

Another large component of our waste — such as food waste — is composed of plant or animal products, which are **biodegradable**.

**Biodegradable Materials:** Items that can decompose and be absorbed by the environment when exposed to the right air, water, and temperature conditions are classified as biodegradable.

Decomposition occurs through the work of microorganisms that break down biodegradable waste into simpler components that can be absorbed by the environment.

To learn what is in NYC's residential waste, visit the “What's in NYC's Waste” pages in “Resources” on [nyc.gov/wasteless](https://www.nyc.gov/wasteless).



## Can Waste Be Harmful?

Some commonly used household products can be dangerous if they are used or thrown away improperly. Sanitation workers can suffer eye, respiratory, and burn injuries from harmful products that are not disposed of properly. In addition, toxic chemicals from these products can contaminate the environment and pollute the water, soil, and air.

Certain harmful products (such as fluorescent bulbs, paints, pesticides, and cleaning products) can be legally discarded in residential trash because residents usually generate such small quantities of these products.

NYC residents may bring certain products to NYC Department of Sanitation's Household Special Waste Drop-Off Sites. Visit [nyc.gov/wasteless/specialwaste](https://www.nyc.gov/wasteless/specialwaste) for locations in every borough and what they accept.

The NYC Department of Sanitation holds annual SAFE Disposal events throughout the City where NYC residents can drop off all types of hazardous materials. Visit [nyc.gov/safedisposal](https://www.nyc.gov/safedisposal) for information about upcoming events.



## What Is Waste?

# Understanding What We Throw Away

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**Time:**

20 – 40 minutes, depending on whether you watch the video

**Subjects:**

English Language Arts, Science

**Vocabulary:**

biodiversity, climate change, ecosystem, extinction, natural resources, nonrenewable resources, pollution, recovered materials, recycling, reducing, renewable resources, reusing, trash, virgin materials, waste

**Goals and Objectives:**

Students learn about what their waste is made of and how their decisions about waste impact the environment. They will complete ***Understanding What We Throw Away Handout*** and a short writing or drawing-based activity.

**Teacher's Note:**

*This Activity can be completed without viewing the **TrashMasters! Waste Side Story video**, depending on your time and equipment availability.*

**Materials:**

- Copies of ***Understanding What We Throw Away Handout***
  - ***TrashMasters! Waste Side Story video*** (optional, available on [nyc.gov/wasteless](https://nyc.gov/wasteless))
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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 what we throw away.

**Suggested Discussion:** Ask the class what they consider to be waste. Where does our waste go?

**Exploration:**

1. Watch ***TrashMasters!*** or a similar video with the class. Discuss the facts that your class found to be interesting.
2. Distribute copies of ***Understanding What We Throw Away Handout***.
3. Read the beginning of the handout together and give the class time to answer the questions.
4. Encourage the class to share their responses with each other.

### Expanded Exploration:

Review the connection between students' decisions about waste and their impact on the environment. Ask them to brainstorm items that could be reused instead of discarded and ask them what kinds of things they recycle.

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Include a **read aloud** component by reading the handout with your class.

Follow the Activity instructions.

After the students have completed the handout, ask them to turn it over and illustrate one of the following:

1. how an item they use, such as a toy, backpack, or scooter, is made of many different parts
2. an item they use that can be reused and recycled

### Intermediate:

Follow the Activity instructions, and also encourage the students to offer their own questions about reducing, reusing, and recycling. Include a short writing assignment.

Possible questions include:

- How can we reduce our waste by cutting back on items that we use only once?
- What kinds of things could we reuse?
- What are some examples of when you've reused materials?
- What would happen if you didn't recycle?

Ask them to share their essays with the class.

### Advanced:

Follow the Activity instructions, and have the class work in groups of four. Ask each group to select two or more of the vocabulary terms and design a research-based presentation for the class that incorporates those terms.

## What Is Waste?

# Understanding What We Throw Away Handout

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

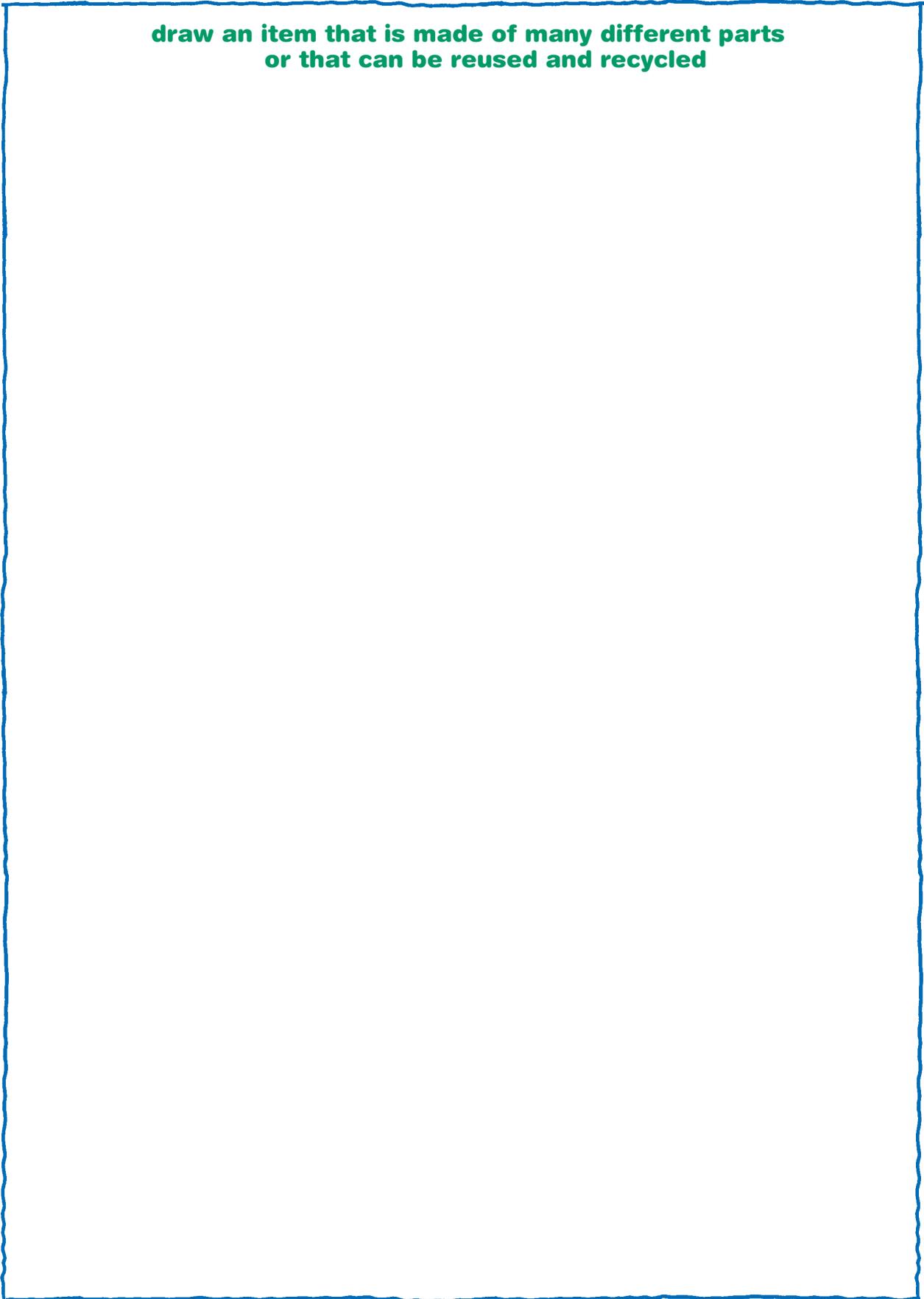
Everything comes from somewhere. This piece of paper and the pencil you are writing with were made in part from trees and may also include recycled materials. The clothes you are wearing may come from cotton, wool, or a combination of synthetic materials. All of these items were made and distributed by people and machines.

Air, water, trees, coal, oil, and natural gas are examples of **natural resources**. Natural resources that are being mined or extracted for the first time are called **virgin materials**. Materials that can be used again or **recycled** to produce new products are called **recovered materials**. Natural resources that can be easily replenished, like many types of trees, are called **renewable resources**; while natural resources that are in a limited supply, like fossil fuels, are called **nonrenewable** resources.

If we overuse something that can't be replenished or we choose to not reuse it, this will upset the balance of the **ecosystem**, or the connection between a community of organisms and their environment. When we mine something too much and when we use plants faster than they can replenish themselves, this causes **pollution** and often **extinction**. Burning too many fossil fuels, which are used in gas tanks and to make plastics, build up excessive amounts of greenhouse gasses that are a cause of **climate change**. To preserve **biodiversity**, or the variety of living things, we must pay close attention to the decisions we make each day that directly affect the environment: what we choose to purchase, what is in our waste, and how we decide to dispose of it.

1. What do you consider to be waste? List the last five things you threw away.
2. Pick two items to describe: What is each made out of? Where do its components come from?
3. Think about some items that you use only once and then discard. What other options are available for these items?
4. What items do you use that could be recycled in New York City?

**draw an item that is made of many different parts  
or that can be reused and recycled**



## What Is Waste?

# Discovering How Much Waste We Produce Each Day

### Time:

25 minutes

### Subjects:

English Language Arts,  
Science, Math

### Goals and Objectives:

Students will learn about the amount of waste each person produces each day. They will complete **Weight Recording Handout** and measure the waste a person produces each day.

### Teacher's Note:

*This Activity is helpful for reviewing and applying math skills. You may also want to incorporate other measurements.*

### Materials:

- A **scale**
- Typical **trash items** (such as alkaline batteries, food scraps, soiled napkins, and paper towels)
- Typical **recyclables** (such as mixed paper, junk mail, empty cans and bottles)
- 1 **box** (large enough to hold 4 pounds of this collection)
- Copies of **Weight Recording Handout**

## Activity

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

### Warm Up:

**Class Discussion:** Determine students' prior knowledge and understanding of how much waste we produce each day.

**Suggested Discussion:** Ask the class how much waste they think they produce each day. How much do they think it weighs?

### Exploration:

1. Distribute **Weight Recording Handout** and have them complete it individually or in pairs.
2. Show the class the collection of items you gathered and ask them how much they think all of it weighs, in total.



3. Weigh each item. Record the weights.
4. Ask the class if they know how much waste each American produces each day. After they have had a chance to guess and think about this, inform them that the average American produces more than four pounds of waste each day. If your class has Internet access, invite students to find out the most current figures on our daily waste production. Ask them if they think this figure seems like more or less than what they expected?

### Expanded Exploration:

Engage students in a discussion about how much waste they accumulate each day, each week, and each month. Have them brainstorm how they could reduce, reuse, or recycle items they normally would throw away as trash. Ask them to come up with other ideas about how they may be able to cut down on their waste.

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Follow the Activity instructions.

Have the class illustrate and describe what four pounds of waste looks like. Ask them to figure out how much waste per day their entire class or family produces. They should share their illustrations with the class.

### Intermediate:

Follow the Activity instructions and ask the students to figure out how much waste their entire class or family produces each day and how much is produced in a week, month, and year.

Ask them to write a short response about observations they have made about their own waste and to describe at least five ways that they may be able to reduce waste. They should share their work with the class.

### Advanced:

Follow the Activity instructions and ask the class to calculate how much waste they produce each day. Is it more or less than four pounds? Do they think they could reduce their waste to less than four pounds each day? Ask them to calculate how much waste they produce each week, month, and year.

Let them choose from three writing assignment questions and encourage them to make a brochure or poster of their findings to share with the class:

1. Do you think the amount of waste a person produces can be reduced?
2. What are five items that you throw away as trash that you could reduce, reuse, or recycle?
3. Describe how taking responsibility for your own waste impacts the city, country, and world.

# What Is Waste?

## Weight Recording Handout

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

1. What is the weight of the empty box itself?
2. What is the total weight of the box with everything inside?
3. Calculate the total weight of all of the items inside the box (#2 total weight minus #1 weight of the empty box).
4. How much would you guess is the weight of the waste that a person makes each day?
5. Work with your class to figure out the actual amount of waste a person makes each day and write down the result here.
6. What is the difference between the weight of waste you thought a person produced each day and the actual weight?
7. How much waste does your whole class produce each day?
8. How much waste does your class produce each week?





## What Is Waste?

# Understanding the Types of Materials We Throw Away

### Time:

30 minutes

### Subjects:

English Language Arts, Science

### Vocabulary:

biodegradable, decomposition, non-biodegradable, nonrenewable resources, renewable resources

### Goals and Objectives:

Students will start thinking about the origins of materials and how to reuse and recycle them. They will complete **Types of Materials Handout** and create a collage art project.

### Teacher's Note:

*You can do this Activity in two parts, as indicated by Part 1 and Part 2. This Activity is a good follow-up to Activity 1, which introduces the concepts of renewable and nonrenewable resources.*

### Materials:

#### For Part 1:

1 item of each kind:

- **Renewable resource** (paper)
- **Nonrenewable resource** (metal can)
- **Biodegradable** (fruit peel)
- **Non-biodegradable** (plastic bottle)

#### For Part 2:

- Copies of **Types of Materials Handout**
- **Magazines** or catalogs
- **Scissors**
- **Tape** or glue

## Activity

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

### Warm Up:

**Class Discussion:** Determine students' prior knowledge and understanding of the types of materials we throw away.

**Suggested Discussion:** What kinds of materials make up our waste?

## Exploration:

### Part 1

1. Using the definitions in the **Glossary**, help the students understand the meanings of: renewable resources, nonrenewable resources, biodegradable, non-biodegradable.
2. Discuss how waste can come from renewable or nonrenewable sources and explain how some are biodegradable. Ask the students for examples of products they use or know of that are biodegradable. Be sure to point out that some material can be categorized more than one way. For example, paper is biodegradable, and also comes from a renewable source.
3. Show examples of each type of waste from the Materials list.
4. Talk with students about the environmental impact of using different resources and creating different types of waste. Explain that non-biodegradable materials cannot be broken down naturally, and nonrenewable resources will some day run out.
5. Explore which types of plastics can be recycled in New York City ([nyc.gov/recycle](https://www.nyc.gov/recycle)). Let the students know that it's okay if they accidentally put an item in a recycling bin when it can't be recycled.

### Part 2

1. Now that your class has discussed how to identify four general categories of waste, they can complete side 1 of **Types of Materials Handout**.
2. Review the answers with the class.
3. Have the class turn over the handout and create a collage that illustrates what they have learned. Each box on the page displays a general category heading. Have them paste images from magazines into the renewable, nonrenewable, biodegradable, and non-biodegradable categories. Remind them that some items may fall under more than one category.

## Expanded Exploration:

Display the collages in the classroom or hallway. Encourage the class to continue the discussion about how their choices impact the environment. Ask them if they recycle any of the waste from their lunch and if they know how much lunch waste they create each day.

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# Adaptations for Different Grades

*Choose level most appropriate for your class.*

## **Beginner:**

Follow the Activity instructions.

Review vocabulary terms and refer to the **Glossary**.

Divide the class into four or five groups and have each group describe to the class the meaning of one of the vocabulary terms.

## **Intermediate:**

Follow the Activity instructions and connect the lesson to your school's recycling program.

Have the class complete a short written assignment that incorporates the types of materials addressed in this Activity. Do the students know where to recycle their waste? What, if anything, could be improved about the school's recycling system? Have the class set up or improve upon a recycling system in the classroom.

## **Advanced:**

Follow the Activity instructions.

Ask students to write short essays or create presentations on one of the following topics:

1. Do you know if any of the products you use come from renewable resources? Does this knowledge influence whether you purchase the product?
2. Describe the laws around recycling that are enforced in New York City. Do you think people would recycle as much as they do without these laws? What other laws or community programs would you implement in order to get more people to reduce, reuse, and recycle?



## What Is Waste?

# Types of Materials Handout

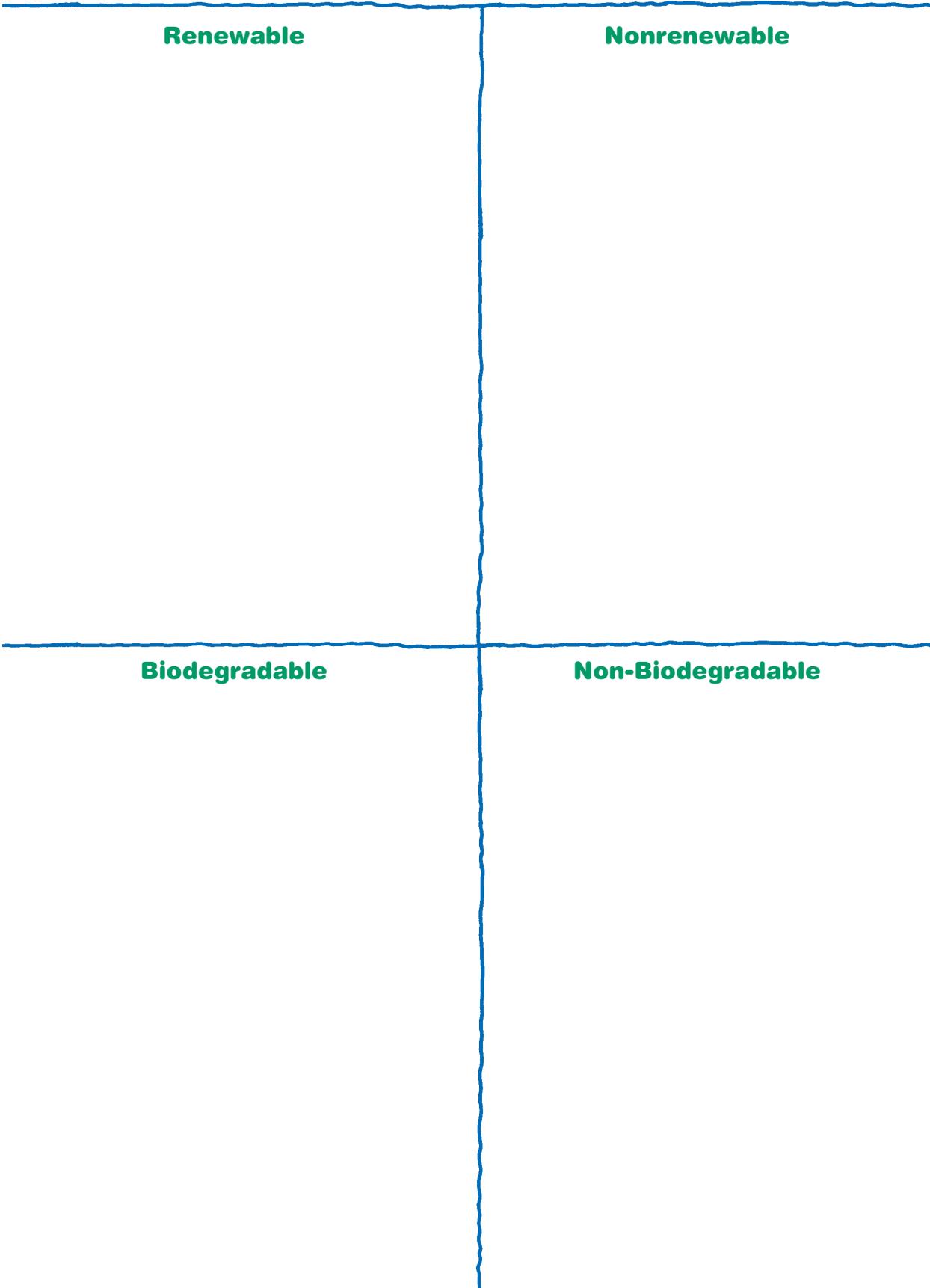
Name \_\_\_\_\_ Date \_\_\_\_\_

Fill in the blank with the following word choices:

**biodegradable, decomposition, non-biodegradable materials, non-renewable resources, renewable resources**

Some words may be used more than once.

1. Raw materials that can be replenished are considered \_\_\_\_\_.
2. Resources that are limited in supply are referred to as \_\_\_\_\_.
3. Items that can decompose and be absorbed by the environment when exposed to the right air, water, and temperature conditions are classified as \_\_\_\_\_.
4. \_\_\_\_\_ occurs through the work of microorganisms that break down biodegradable waste into simpler components that can be absorbed by the environment.
5. \_\_\_\_\_ are materials that cannot decompose or be broken down by the environment, such as foams, plastics, and glasses.
6. An example of \_\_\_\_\_ is the wood from trees that is used to make paper. After being cut down, new trees can be planted.
7. The iron used to make metal cans would fall under the category of \_\_\_\_\_ because once it is mined it cannot readily be replenished.



## What Is Waste?

# Exploring Waste from Individual Lunches

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**Time:**

20 – 30 minutes

**Subjects:**

English Language Arts,  
Science, Math

**Vocabulary:**

biodegradable, compost,  
non-biodegradable,  
nonrenewable resources, recycle,  
reduce, renewable resources,  
reuse

**Goals and Objectives:**

Students will examine their own lunch waste, find its weight, and explore ways to reduce, reuse, and recycle it.

**Teacher's Note:**

*This Activity can easily be modified to suit your school's lunch program and coordinate with what your class is studying in math and science. Students can complete this Activity with or without their leftover lunch waste. If you choose to do this Activity without all of the students keeping their lunch waste, you may want to gather a sample of discarded lunch waste to help them visualize the lesson.*

**Materials:**

- Copies of **Lunchroom Waste Worksheet**
  - **Student lunches** or one sample of student lunch waste: packaging, food waste, and lunch tray
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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 much waste comes from individual lunches.

**Suggested Discussion:** Ask the class how much waste they think is left over each day from their lunches. Where does the waste go after it is discarded?

**Exploration:**

1. Distribute copies of **Lunchroom Waste Worksheet**. Show the class the lunch waste sample or ask them to examine their own lunch waste.
2. Refer to the lunch waste sample or the students' lunch waste to complete the handout.
3. Encourage the students to share their findings with the class.
4. Ask the class which, if any, of the items they could have done without? Which items can they reuse? Which items can be recycled?

### Expanded Exploration:

Ask the students to think of ways they can reduce, reuse, and recycle. What are some ways they can teach others about reducing, reusing, and recycling?

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Follow the Activity instructions. Complete the handout in small groups or collectively as a class.

Invite students to draw everything that was in their lunch today, including all food, peels, packaging, and containers.

Next, ask them to draw before and after pictures of their uneaten lunch and what was left over from lunch. Finally, ask them to draw or write their ideas about how they can reduce the amount of waste left over from their lunches. Encourage them to share their work with the class.

### Intermediate:

Follow the Activity instructions, and group the students into small teams. Ask them to create a lunch menu of balanced meals that have as little packaging as possible. Describe how each item of the lunch waste can be recycled, composted, or discarded as trash. Have the teams present their menu projects to the class.

### Advanced:

Follow the Activity instructions.

Give the students a choice of three projects:

1. Create an art project with your left over lunch waste and write an artistic statement that connects the piece to reducing waste.
2. Write a research paper about how other schools worldwide approach reducing lunch waste.
3. Create a project proposal for your school that includes a sample menu of meals that are nutritionally balanced and also reduce waste. Include details about how you would improve upon waste management strategies. The students should present their projects to the class.

## What Is Waste?

# Lunchroom Waste Worksheet

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

1. List every item that was in your lunch today, including food, peels, containers, wrappers, and other packaging.
2. How much would you guess that your lunch weighs before you eat it?
3. Which of the items that you listed in question #1 are left over after you ate your lunch?
4. How much does this waste weigh?
5. Which items could you reduce? Reuse? Recycle?
6. How much lunch waste do you make each week?
7. How much lunch waste do you make each month?
8. How much lunch waste do you make each school year?
9. How much lunch waste does your class make per day?
10. How much lunch waste does your class make per week?
11. How much lunch waste does your class make per month?
12. How much lunch waste does your class make per school year?



## What Is Waste?

# Safe and Smart Ways to Handle Harmful Household Waste

**Time:**

30 minutes

**Subjects:**

English Language Arts, Science

**Goals and Objectives:**

Students will learn how to identify and dispose of harmful household waste. They will read and complete **Safe and Smart Handout** and a follow-up writing project to connect what they have learned to their family's everyday decisions.

**Vocabulary:**

combustible, contaminate, corrosive, flammable, harmful, poisonous, toxic, vapors

**Materials:**

- Copies of **Safe and Smart Handout**

## Activity

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

**Warm Up:**

**Class Discussion:** Determine students' prior knowledge and understanding of household harmful waste and how to dispose of it.

**Suggested Discussion:** Ask the class to think of items in their homes that could be considered harmful waste. Why are these items dangerous? How do you dispose of them?

**Exploration:**

1. Distribute copies of **Safe and Smart Handout**.
2. Read and discuss the first side of the handout as a group.
3. Have the class complete the second side of the handout.
4. Assign a follow-up writing project from the Adaptations section.

**Expanded Exploration:**

Encourage class discussion about hazardous waste and disposal risks. Ask the class why they think it is important to think about harmful waste disposal.

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# Adaptations for Different Grades

*Choose level most appropriate for your class.*

## Beginner:

Read and review the first side of **Safe and Smart Handout** with your class.

Review the vocabulary terms by referring to the **Glossary**. If the reading component is too advanced for your class, summarize the information and instruct students to always have a parent or adult handle products and waste that could be harmful. Instead of completing the second side of the handout, ask the class to develop a warning label for a harmful product. Ask each student to draw a symbol of caution and to write a warning label that includes at least one of the vocabulary words.

## Intermediate:

Follow the Activity instructions.

Have the class work in small groups on a follow-up project. Each group should develop a project and presentation on how to reduce harmful waste. This could be a PSA (public service announcement) or a manual or even a kit. Here are some sample projects:

- Why should you purchase a nontoxic product instead of a toxic one?
- What are some nontoxic cleaning ideas?
- What are some ways you can help others learn how to reduce their consumption of harmful products and safely discard the harmful products they have?

## Advanced:

Follow the Activity instructions.

Give the class two writing assignment options:

1. Select a harmful product and write an essay describing the disposal risks. Include alternatives to that product and their benefits.
2. Write a research article about the consequences of harmful materials when they contaminate the environment.

Ask students to share what they have learned with the rest of the class.

## What Is Waste?

# Safe and Smart Handout

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## What Are Harmful Products?

Commonly used household and automotive products can be harmful to you, your family, city workers, and the environment if improperly stored, used, or discarded. Accidental swallowing or improper use of products can cause severe illness and even death.

Some household products can be dangerous after they are thrown away. If these items are improperly discarded, Sanitation workers can suffer eye, respiratory, and burn injuries. In addition, toxic chemicals from these products can contaminate the environment and pollute the water, soil, and air.

Harmful waste can be found in liquid or solid form, or anything in between. Many items like antifreeze are considered harmful because they are poisonous if ingested by humans or animals; this toxic product tastes sweet to pets and other animals, so spills are especially dangerous. Electronics like cell phones and computers are made with heavy metals while other items like fluorescent light tubes and thermometers contain mercury. These metals can damage ecosystems by seeping from landfills into our water supply.

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## Safe Handling and Disposal Tips

**Read the label.** Products that are highly toxic have a warning label. Look for words like “DANGER” and “POISON.” Other messages that describe the danger, like “causes burn on contact,” and “highly flammable,” or “highly combustible,” or “corrosive,” or “harmful vapors” offer additional clues that the product is hazardous.

**Try to use products that are not harmful to the environment.** There are many alternatives to toxic products. These products are made with safer ingredients and are often organic. Industry certifications help consumers identify more environmentally preferable products. Be creative. Instead of chemical cleaning products, try using baking soda and white vinegar.

**Don't buy more than you need.** It's important to be aware of how much you actually need to use so that you don't produce more waste than is absolutely necessary, especially when it comes to hazardous waste.

**Follow product instructions.** More is not better — you won't get twice the results by using twice as much. Use products only as directed and only when necessary.

**Never mix products or chemicals.** This is especially true for ammonia and bleach, which can cause respiratory problems when combined.

**Store potentially harmful products out of the reach of children and pets.** Use child-proof cabinet locks or containers.

**How to discard harmful products.** Certain harmful products (such as fluorescent bulbs, paints, pesticides, and cleaning products) can be legally discarded in residential trash because residents usually generate such small quantities of these products.

NYC residents may bring certain products to NYC Department of Sanitation's Household Special Waste Drop-Off Sites. Visit [nyc.gov/wasteless/specialwaste](https://nyc.gov/wasteless/specialwaste) for locations in every borough and to learn what to bring.

The NYC Department of Sanitation holds annual SAFE Disposal events throughout the City where NYC residents can drop off all types of hazardous materials. Visit [nyc.gov/safedisposal](https://nyc.gov/safedisposal) for information about upcoming events.

# What Is Waste?

## Safe and Smart Handout

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

### Vocabulary

Please answer the questions by incorporating some of the vocabulary words listed in the box.

**combustible, contaminate, corrosive, flammable, harmful, poisonous, toxic**

1. What are some examples of harmful products? Why are they considered harmful?

2. How could someone know if a product is toxic?

3. List some ways you could reduce your consumption of these products.

4. How would you dispose of harmful products?

5. Why should we avoid throwing away harmful waste in the regular garbage?



## What Is Waste?

# Life Cycles of Products

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**Time:**

30 minutes

**Subjects:**

English Language Arts, Science,

**Goals and Objectives:**

Students will explore the life cycles of products and create a narrative about an item, such as a t-shirt, a pencil, or a cell phone, that illustrates the steps of how the product was made, transported, used, and how it will be disposed.

**Vocabulary:**

manufacture, natural resources,  
recycle, reduce, reuse

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**Materials:**

- **Internet access** for research (optional)
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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 the concept of a life cycle.

**Suggested Discussion:** Ask the class if they have ever thought about where products come from and how they are made. Can they describe the life cycle of a product?

**Exploration:**

1. Review the basic steps of a product's lifecycle.
  - **Raw material acquisition:** the raw materials or natural resources that make up a product are harvested or extracted. For example, trees are harvested and cut down in order to make paper or wood products; crude oil is extracted to make plastics.
  - **Material manufacture:** raw materials are processed. For example, crude oil is made into the polymers that make plastics.
  - **Product manufacture:** materials are made into specific products.
  - **Transport:** products are transported to stores where they are sold to customers.
  - **Use:** the products are purchased and used by consumers.
  - **Disposal, reuse, or recycle:** the product is used again, recycled into another product, or disposed.

2. Ask the students to select a product and investigate the various steps associated with its life cycle. It would be helpful to let the class use computers to research the life cycle of the products they choose. If you do not have Internet access, you may want to have the students work in small groups and assist them with identifying the materials and steps for each product.
3. Have the students illustrate and write the life cycle steps of their products.

### Expanded Exploration:

Students should present their projects to the class. Ask them to think about the energy required for each step from materials acquisition to transporting the products. How does this impact the environment? How do our decisions as consumers impact the environment?

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## Adaptations for Different Grades

*Choose level most appropriate for your class.*

### Beginner:

Follow the Activity instructions.

Review vocabulary terms by referring to the **Glossary**. You may want the class to work together in small groups to identify and illustrate the life cycle steps.

### Intermediate:

Follow the Activity instructions.

You can expand this project into a research assignment that compares the steps of multiple products and connects how their life cycles impact the environment.

### Advanced:

Follow the Activity instructions.

This project can be expanded into a research project that examines a specific product and how the product's life cycle affects the environment. It should also connect how the everyday decisions of consumers impact the environment.

# What Is Waste?

## Learning Standards

### Activity 1: Understanding What We Throw 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 3 Craft and Structure

##### 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  
Subsection 10 Range of Writing  
Subsection 11 Responding to Literature

##### 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  
Subsection 3 Knowledge of Language  
Subsection 4 Vocabulary Acquisition and Use

#### The Applied Learning Performance Standards

A2 Communication Tools and Techniques

#### 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.

# What Is Waste?

## Learning Standards

### Activity 2: Discovering How Much Waste We Produce Each Day

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

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

Subsections 1, 2     Text Types and Purposes  
 Subsection 4         Production and Distribution of Writing

##### 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

#### New York State Common Core Learning Standards for Mathematics

Subsections 1, 2     Counting and Cardinality  
 Subsection 1         Operations & Algebraic Thinking  
 Subsection 1         Measurement & Data

#### 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 7.1 b,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.

# What Is Waste?

## Learning Standards

### Activity 3: Understanding The Types of Materials We Throw Away

#### 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 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

Subsection 1 Comprehension and Collaboration

Subsection 4 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 4 Vocabulary Acquisition and Use

#### The Applied Learning Performance Standards

A2 Communication Tools and Techniques

#### 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 7.1 b,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.

# What Is Waste?

## Learning Standards

### Activity 4: Exploring Waste from Individual Lunches

#### 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 7, 8 Research to Build and Present Knowledge

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

Subsection 2 Comprehension and Collaboration

Subsections 4, 5, 6 Presentation of Knowledge and Ideas

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

Subsections 1, 2 Conventions of Standard English

#### New York State Common Core Learning Standards for Mathematics

Subsections 1, 2 Counting and Cardinality

Subsection 1 Operations & Algebraic Thinking

Subsection 1 Measurement & Data

#### The Applied Learning Performance Standards

A1 Problem Solving

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 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.

# What Is Waste?

## Learning Standards

### Activity 5: Safe and Smart Ways to Handle Hazardous Waste

#### 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
Subsection 10	Range of Reading and Level of Text Complexity

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

Subsections 1, 2, 3	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

Subsection 1	Comprehension and Collaboration
Subsection 4, 6	Presentation of Knowledge and Ideas

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

Subsections 1, 2	Conventions of Standard English
Subsection 3	Knowledge of Language
Subsections 4, 5, 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 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 6.1, IPS 1.1-1.4, IPS 2.1

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

# What Is Waste?

## Learning Standards

### Activity 6: Life Cycles of Products

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

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

Subsections 2, 3     TextTypes, 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  
 Subsection 4        Vocabulary Acquisition and Use

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

A2    Communication Tools and Techniques

#### **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.