# TEACHER'S GUIDE

## GRADE 3 UNIT: Trashbot

ThinkEarth

ENVIRONMENTAL EDUCATION CURRICULUM

# Contents

# Learning About Pollution

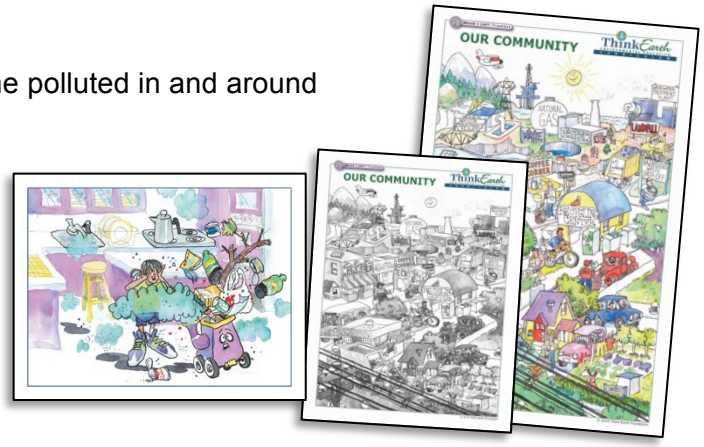
## Objectives

**Concepts:** Students will understand the following environmental concepts:

a. We use natural resources from the environment to produce products that we use.
b. Producing, distributing, and consuming products all create waste.
c. Waste goes into our water, onto our land, and into our air.
d. Our trash disposal system and water treatment system manage most waste.
e. Improper disposal of waste on land or in water can cause pollution.
f. Burning fossil fuels for energy puts pollutants into the air.
g. Pollution harms the environment and all living things in it.
h. We are working on ways to minimize pollution.

**Skills:** Students will:

a. Identify ways that soil, water, and air can become polluted in and around our homes and neighborhoods.




## Materials

- Story 1, *Trashbot* (video or PDF)
- *Our Community* color poster
- *Our Community* poster in black and white

## Preparation

- Prepare to present Story 1, *Trashbot*. (Show students the video, **or** project the PDF pictures and read the story aloud, **or** print the PDF and create a book to read.)
- (Optional) Make copies for students of Story 1. See Procedure B.
- Prepare to project the *Our Community* color poster.
- (Optional) Make a copy of the black and white poster for each student.

## Vocabulary

- **built environment** – everything people build or make from natural resources
- **fossil fuels** – oil, coal, and natural gas—which formed in the earth from the remains of prehistoric plants an animals
- **landfill** – area of land where trash is buried
- **minerals** – substances we take from the ground, e.g., metal ore and sand, and make into products
- **natural environment** – everything from nature—sunlight, air, water, land, plants, animals, humans
- **pollution** – filled with a lot of unclean and harmful substances
- **wastewater treatment plant** – a place that cleans water that goes down our drain

## Procedures

### A. Take an "environmental" walk

- Write the following two terms on the board: *Natural Environment* and *Built Environment*. Ask students what they think these terms mean. Explain that the natural environment:
  - comes from nature
  - consists of sunlight, air, water, land, plants, animals, and humans—which are all natural resources.

  Point out that the built environment:
  - is made by people
  - includes buildings, roads, clothes, computers, and other products that we use to live
  - is all made from natural resources, such as trees and fossil fuels, from the environment.

- Tell students that they are going outside to look for examples of these two environments. Have students bring paper and pencil on the walk. *(**Note:** If your class is unable to go outside, conduct this activity as a class discussion. Ask students to think about what they might find outside that would be part of the natural environment and part of the built environment.)*

- Take students on a brief walk, perhaps around the perimeter of the school. Have students work either in teams or individually. Ask them to make two lists—things they see in the natural environment and things they see in the built environment.

- After the walk, list on chart paper or on the board what students found in the natural environment and in the built environment.

- Ask students how each of the following elements of the natural environment help us live and how they affect other things in the environment.
  - **Sun** (*The sun gives us warmth and light. Without sunlight, plants could not grow, and we'd have no food.*)
  - **Air** (*Living plants and animals, including people, must have plenty of fresh, clean air to breathe and grow.*)
  - **Water** (*Plants, animals, and people need fresh, clean water to live.*)
  - **Land** (*We build our homes and grow our food on land. We live on the land, and we take many natural resources from the land.*)
  - **Plants and Animals** (*Plants and animals give us the food we need to live. We also use them for many other things, such as clothing, paper, fabric.*)

- Ask students to imagine life without either the natural environment or the built environment. Help students to see that both environments are important to us.

### B. Show or read Story 1, *Trashbot*

- Present the story *Trashbot* to students in one of the following ways:
  - Show the video.
  - Project the pictures from the PDF and read the text from the script (included in the PDF and at the end of this lesson).
  - Give each student a copy of the story or project the script and have students either follow along as you read the story or read the story aloud themselves while you show them the pictures from the PDF.
  - Print the PDF and create a book to read to students.

- Use the questions below to discuss the story. Either call on individual students to answer questions or reproduce the questions for students and have them work in teams to answer the questions.

1. **What natural resource is a comic book made from?**
   *(A comic book is made mainly from trees.)*

2. **What are some of the wastes from producing one comic book?**
   *(Leaves and branches are sometimes left over from trees that are used for paper. Ink cans and chemical bottles are left after the ink and chemicals are used. Boxes and wrappings that held the paper become waste when they are empty. The bag the comic book came home in might get thrown away. And water gets dirty all along the way, from making the paper to cleaning things. Waste goes into the air when fossil fuels are burned to make the electricity needed to make the comic book and to transport it.)*

3. **Does all this "waste" need to be thrown away?**
   *(No. Many things, such as boxes and bags, can be reused. Other things—such as cans, bottles, and paper—can be recycled.)*

4. **Do all these "waste" products come from natural resources?**
   *(Yes. Paper comes from trees; electricity, chemicals, and plastic come from fossil fuels; metal and glass come from minerals in the ground.)*

5. **What happens to the waste that we put into trash cans?**
   *(Trash gets picked up by trash trucks and is usually taken to a landfill where it is buried under dirt.)*

6. **What happens to the waste that goes down our drains?**
   *(In most places, especially in cities, dirty water goes down our drains through the sewer to a wastewater treatment plant where dirt and germs are removed before the water is put into rivers, lakes, oceans, or the ground—back into the water cycle.)*

**7. What can happen if dangerous chemicals get into landfills or into our water?**
*(They can pollute the soil and the water, making them unsafe and unhealthy.)*

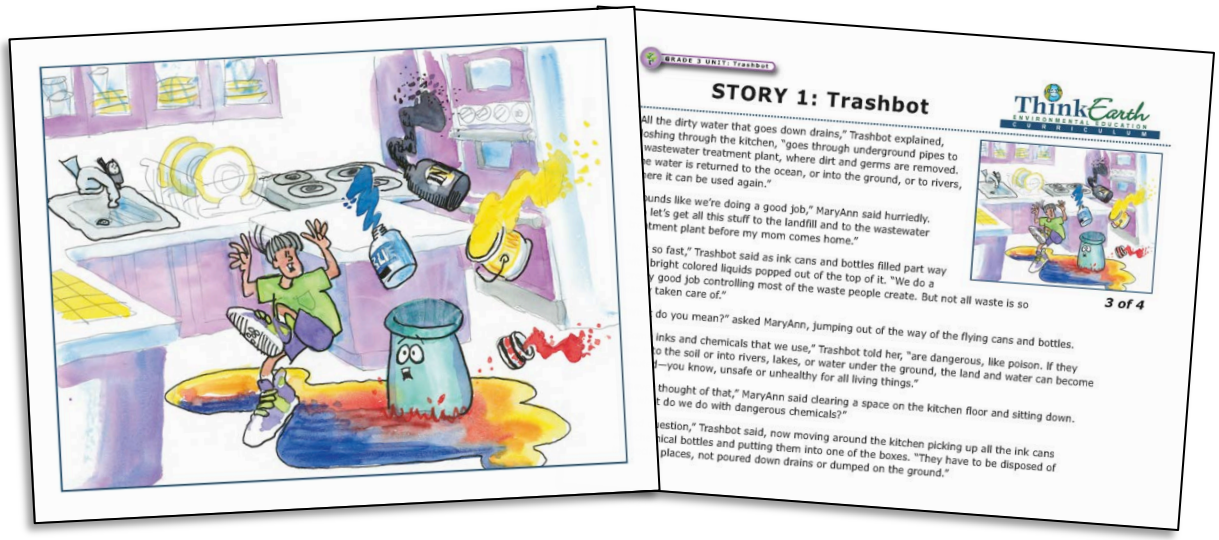
**8. What should we do with dangerous chemicals, such as bug spray and paint remover, and with old electronic equipment, such as computers, printers, and cell phones?**
*(Dangerous chemicals and electronic appliances and equipment must be taken to special places so that they will not pollute the environment. They should not be put in the trash or down drains.)*

**9. How does waste get into our air?**
*(Particles, gases, and smoke are released into our air whenever we burn things. We burn fossil fuels for most of the energy we use—to make electricity, to make heat, and to run our cars.)*

**10. What happens when our air gets polluted?**
*(The air is not clean so it can make us cough or make our eyes sting. Sometimes it is not safe to breathe.)*

**11. What do we do about pollution in our air?**
*(We've found ways to cut down on how much gets released into the air, but a lot of harmful substances still go into the air. Once the air is polluted, there is not much that we can do.)*

**12. What happens when our land gets polluted? When our water gets polluted? When our air gets polluted?**
*(When our **land** gets polluted, we can't safely grow plants to eat. When our **water** gets polluted, people, plants, and animals can't safely drink it. And when our **air** gets polluted, people and animals have a hard time breathing, and plants do not grow as well.)*



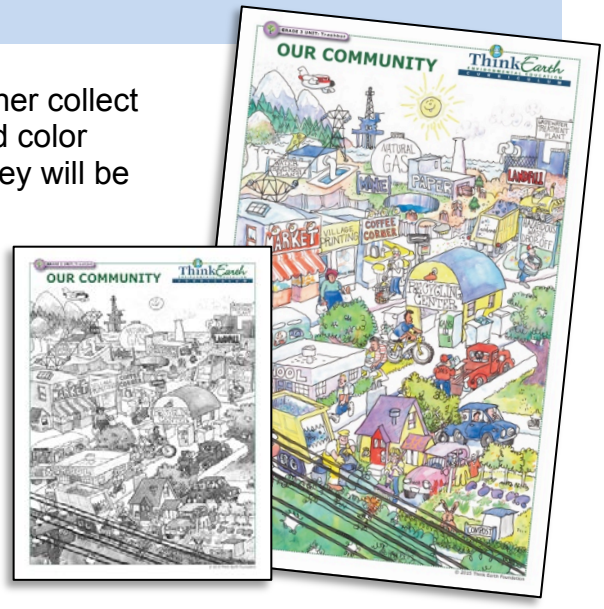
## C. Discuss the poster, *Our Community*

- Project the color version of the *Our Community* poster for students to view. If applicable, have them view the poster on their tablets or computers, or give each student a copy of the black and white poster.

- Explain to students that the poster shows the environment within a community where people live and work. Ask students to point out the following on the poster:

| Find… | Possible Answers |
|---|---|
| 1. things in the natural environment | *sun, water, air, soil, plants, animals, people* |
| 2. things in the built environment | *houses, buildings, cars, clothes, bicycle, power poles and lines, etc.* |
| 3. places where people produce products from natural resources | *paper mill, water treatment plant* |
| 4. places where products from natural resources are sold | *grocery market, Coffee Corner* |
| 5. the "lifecycle" of a comic book that gets thrown away | *from forest to paper mill, to print shop, to market, to someone's home, to the trash can, to the trash truck, to the landfill* |

- If you distributed black and white posters, either collect them or have students keep their posters and color them in their spare time. Tell students that they will be looking at the posters again later.



## Additional Activities

- **Demonstrate solid, liquid, and gaseous forms**. Melt an ice cube (solid) to form water (liquid). Then boil the water to create steam (gas). Continue to boil the water until it disappears. Ask students to figure out where the water went (*evaporated into the air*). Ask students to determine common wastes that are solids (paper, cans, leaves, glass, plastic); liquid (leftover beverages, dishwater, bathwater, paint); and gas (gases from burning fossil fuels in cars, heaters, factories; vapors from chemicals and paints).

- **Learn a song.** Teach students the following song. If desired, have students listen and sing along to the audio of either the vocal or instrumental recording. *(**Note:** A new verse is added to this song at every grade level.)*

  (*to the tune of "Twinkle, Twinkle Little Star"*)

  Think Earth, Think Earth is our song.
  Everyone should sing along.

  Don't waste paper, save a tree.
  It is good for you and me.

  Think Earth, Think Earth is our song.
  Everyone should sing along.

  Turn off lights and the TV.
  It is good for you and me.

  Think Earth, Think Earth is our song.
  Everyone should sing along.

  Reduce, reuse, recycle too.
  It is good for me and you.

  Think Earth, Think Earth is our song.
  Everyone should sing along.

  Water, land, air, and sea,
  Keep them clean for you and me.

  Think Earth, Think Earth is our song.
  Everyone should sing along.

# STORY 1: Trashbot





MaryAnn had finished reading her new comic book, "Earthlings," and tossed it into the trash can as she walked by. Just as the booklet hit the trash, she heard, "Get that out of here!"

MaryAnn turned around, surprised. "Who said that?" she asked.

"I did," said the trash can, which all of a sudden looked less like a trash can and more like a robot or something—a Trashbot. "Throwing away that perfectly good comic book is not good for the environment."

"What do you mean?" said MaryAnn. "It's just one little comic book."

"One little comic book!" the Trashbot shouted back. "Why the waste that comes from producing that one comic book could fill this entire kitchen!"

"Yeah, right," MaryAnn muttered as she turned to walk away. But she was stopped short as the one-time trash can turned into various machines, factories, and vehicles and began spewing out leaves and branches, boxes and bags, cans and bottles. Then, out the bottom of this contraption flowed a little river of dirty water.

"Whoa!" said MaryAnn, stepping around and pushing aside all the waste now filling the kitchen. "You mean all this waste comes from making one comic book?"

"This and more," answered the little Trashbot. "From producing the paper from a tree, to printing the words and pictures, to delivering the comic book to the store, to your bringing it home in this plastic bag," it said, coughing up a bag that came from the local market, "all kinds of wastes are created."