IN YOUR SHOES: THE SHOE LANDFILL

GRADES 6-8

This activity was designed as a companion for the music video "Human Landfills."

BACKGROUND

Humans are the only creatures that deliberately pollute, and many times we start to view garbage as something that just disappears after it is picked up by garbage trucks. We forget that hazardous materials and other waste don't just go away when we pay someone else to take care of it.
The average American generates 4.3 pounds of trash every day, which adds up to 1570 pounds each year. While some of this trash is recycled or burned, most of it finds a permanent home buried underground in landfills. As trash decomposes in a landfill it can release harmful chemicals that may affect the soil it's buried in, or the chemicals can move with the groundwater and spread to water sources that humans use. Engineers and scientists seal the trash with manmade structures as well as with the soil, so it won't be able to leak and harm wildlife or humans.

Overconsumption often leads to excessive and thoughtless disposal of items into places like landfills. Learning about the amounts of objects we use and the life cycle of each object will start us thinking in terms of conservation techniques like recycling, reusing, and – most importantly – using less. We need to respect the earth, the animals, the air we breathe, and our own bodies as we think about what happens to waste.

OBJECTIVES

- To recognize alternatives to throwing away shoes
- To recognize excesses
- To recognize that old shoes can be turned into new products
- To see how each of these steps ties into conservation by individuals and groups working together

This activity illustrates the consumption and disposal of shoes by an individual, small group and entire school. Activities provide visual representations of space used by old shoes as well as ideas for reusing and recycling shoes by businesses.

MATERIALS

Stuff: The Secret Lives of Everyday Things
(John C. Ryan and Alan Thein Durning)
Whiteboard and markers
Crayons, colored pencils, and/or markers
Masking tape
Scissors
Shoe Cutouts (p.3 of this lesson)
Shoe Data Sheet (p.5 of this lesson)
Garbage bag
Yard stick
Calculator

TEACHER PREPARATION

This lesson is designed to be taught over two to three class periods. Before beginning the lesson, ask students to count the number of pairs of shoes they own and bring that information to school.

SESSION 1 INSTRUCTIONS

1. Begin the class by brainstorming the various parts of shoes and what comes with shoes when you purchase them (box, stuffed paper, etc.).
2. Read "Shoes" from *Stuff: The Secret Lives of Everyday Things*. Discuss the important points from the article.
   - On average, how many shoes do men and women own? How does that compare to the number of shoes you own?
   - What materials are used to construct a shoe?
   - In what countries are the various parts of shoes made?
   - What is done with excess materials?
   - Having counted the number of shoes each student owns, work together as a class to come up with a grand total.
   - For every 10 pairs of shoes, have the students cut out and color a paper shoe to visually represent these 10 shoes on a graph (sample shoe provided on following page). For example, if your class has 360 total pairs of shoes, you should cut out and color 36 paper shoes.
   - If this lesson is being done as an all-school activity, place all of the paper shoes in a highly visible area such as a cafeteria. Use the paper shoes to assemble a bar graph that illustrates the number of shoes owned by each class.
   - Once all shoes have been posted, calculate how many total pairs of shoes are owned by your school and place that number near the graph.

SESSION 2 INSTRUCTIONS

1. Divide students into small groups (3-4 students). Each group should have a Shoe Data Sheet (p.5 of this lesson), pencil, and calculator.
2. Using the information you collected from your class, have each group fill in the number of shoes your classroom owns.
3. Students can also fill in the number of shoes students from your school own based on the school graph from the previous day OR use your classroom total and multiply that by the number of classrooms in your school.
4. Using 1.5 lbs as an average weight of a pair of shoes, estimate the weight of the shoes your classroom's students own and then the weight of the shoes your school's students own.
5. Next, students determine how much space discarded shoes use. Using a large trash bag, have 10 volunteers remove their shoes and place them in the bag.
6. Ask student volunteers to use a yardstick to measure the length, width, and height (all in inches) of the shoe-filled garbage bag.
7. Students should then use this information to calculate how many square inches or feet all of the shoes in your school take up. Remember that the measurement the students just got is for 10 pairs of shoes!
8. Once the Shoe Data Sheet is filled out, compare calculations as a class to make sure everyone is accurate.

SESSION 3

1. Discuss alternatives to throwing your shoes away.
2. Hang the following signs across the front of the room:
   - Conserve the Shoes!
   - Creek stomping/mowing
   - Hand me-down
   - Consignment shop/selling
   - Charitable organization
   - Trash
   - Other
3. Have students make a bar graph using shoe cutouts to show what they do to dispose of their used shoes.

Help the students to understand that even if they give their shoes to a younger brother/sister, they probably go to the trash next. Or, if they give them to Goodwill and someone purchases them, that person probably eventually throws them away. Most shoes will end up in the landfill.

As a follow up, show "Nike's Made-Out-Of-Trash Shoes" video:
www.youtube.com/watch?v=jparZdtSeEo
There are also other videos on YouTube that show how Nike is now collecting and recycling their shoes to make playgrounds, tennis courts, etc.

SHOE DATA SHEET

	10 pairs of shoes	Total shoes in classroom	Total shoes in school
LxWxH?	Measurements?	Divide by 10 then multiply by number of pairs	Divide by 10 then multiply by number of pairs
Volume (in^3)			
Volume (ft^3)			

	Pairs of shoes my class owns	Pairs of shoes my school owns
Number of Pairs		
	X 1.5 pounds/pair	X 1.5 pounds/pair
Total Weight (lbs)		

*NOTE: To convert from cubic inches to cubic feet, divide by 1728 (1 ft^3 = 12 in x 12 in x 12 in = 1728 in^3). For instance, 3456 in^3 = 3456/1728 = 2 ft^3.

EXAMPLE CALCULATIONS

	Pairs of shoes my class owns	Pairs of shoes my school owns
Number of Pairs	364 pairs	8496
	X 1.5 pounds/pair	X 1.5 pounds/pair
Total Weight (lbs)	546 pounds	12,744 pounds

	10 pairs of shoes	Total shoes in classroom	Total shoes in school
LxWxH?	Measurements?	Divide by 10 then multiply by number of pairs	Divide by 10 then multiply by number of pairs
Volume (in^3)	9450 in^3	9450 in^3/10 = 945 in^3/pair 945 in^3/pair X 364 pairs = 343,980 in^3	9450 in^3/10 = 945 in^3/pair 945 in^3/pair X 8496 pairs = 8,028,720 in^3
Volume (ft^3)	9450/1728 = 5.46 ft^3	343,980/1728 = 199.06 ft^3	8,028,720/1728 = 4646.25 ft^3

Adapted from an activity by Holy Family Catholic Schools: http://www.uni.edu/ceee/sites/default/files/Education/inyourshoes.pdf