Just Look at Our Shoes

What teachers say...

The shoes activity was a huge hit with my class, a cross curricular winner. In math we charted, averaged, multiplied decimals…to figure the [shoes]…thrown in the trash. In writer's workshop they wrote an explanatory and persuasive piece both explaining what the problem is and…researched possible solutions... In computer we searched web sites…and hunted for ways to deal with "shoes." In social studies we discussed third world countries, labor issues...

They are all convinced that shoes are an "issue" to consider.-- Mary Beth Sammons, 5th grade, Highland Elementary, Riverside, Iowa

Grade level: 3-5, 6-8
Subject areas: Economics, English, Math, Science, Social Studies
Estimated duration: Preparation time: 15 minutes (move class in U-shape for bar-graph activity) Activity: 5 minutes for introduction to the lesson, 25 minutes for the shoe collection and bar graphing, 15 minutes for the Reader’s Theatre, 15 minutes for the Counting Shoes activity, 20 minutes for the Open and Closed Systems activity, and 15 minutes for discussion

Setting: Classroom
Vocabulary: Systems, lifecycles

Summary
In this interdisciplinary lesson, students learn about the life cycle of shoes and calculate the quantity of shoes discarded. They learn that the earth is a closed system and that there is no “away.”

Objectives
Students will:
• Explore various systems
• Examine open and closed systems
• Examine product life cycles and how they impact earth systems

Materials
• Blackboard and chalk
• Handouts
• Scale (optional)
• Picture of earth from the atmosphere (optional)

Procedure
The Activity

Introduction: Systems/Life cycles
1) You’ve all studied circulatory and respiratory systems, and probably to some extent ecosystems. Today we’ll look at another kind of system. First, who can name some parts of our circulatory system? (heart, arteries, veins, capillaries)
2) Today we’ll talk about **product cycles**, which are part of **business systems**. Those include product design, manufacturing, transportation, retail sales, purchase and use by consumers, recycling and/or disposal. (Note: At [www.storyofstuff.com](http://www.storyofstuff.com), is a 20-minute video about product cycles.)

3) Explain that students will be looking at the tail end the product cycle of shoes. For more detailed look at a shoe’s lifecycle, use “A Shoe Story,” Attachment III. This uses Reader’s Theatre to looks at lifecycles.

4) Ask students where shoes go when they are done with them. List answers on the board side by side horizontally. (Answers may include charitable organizations, consignment shops, garden shoes, hand-me-downs, trash, etc.) Optional: Print out and post labels from Attachment I.

5) Ask students to remove their shoes (if they are comfortable doing this), and place it in a column that corresponds to the place their shoes would go when they are done with them. This will create a bar graph.

6) What ultimately happens to shoes? Go through each answer, making trash the last one. Ultimately, the class should decide that most all shoes are discarded, as very little recycling is currently done with shoes. (See [Shoe Reuse and Recycling Handout](#).)

7) As students answer what ultimately happens to the shoes in each of the categories identified, move those shoes to the line of shoes going to the trash. All shoes will eventually end up in this line of the bar graph.

8) Put all shoes into a garbage sack, and pass it around. Let students see and feel how heavy the bag is, and note that this is just one classroom’s pairs of shoes.

**Counting shoes**

1) Ask students to gather in groups of four and determine how many shoes each student owns. Be sure they include sandals, flip flops, work boots, etc. Then ask them to calculate the average number of shoes owned by the four students.

2) Ask each group to report their answers to the large group. Write them on the board.

3) As a group, calculate the average number of pairs of shoes owned by the class.

4) Weigh a pair of shoes and calculate the weight of the shoes owned by all students in the class. Remind the students that, eventually, all of these shoes will end up in the garbage.

5) As a group, estimate through calculations the average number of pairs and weight of shoes owned by students in their school.

6) Many other calculation possibilities can be conducted. Students may also poll family or friends to discover the number of shoes purchased annually. See Attachment II for examples of calculations.

**Closed systems/Open systems**

1) Draw a house on the board and ask students to think of things that enter their homes (water, electricity, bugs, clothes, food, etc.). Ask students to come to the board and write the name of one of these items inside the diagram of the house drawn on the board.

2) Now ask students to name things that leave our houses, explaining that houses are open systems because things enter and leave the system. When students name things that are listed in the diagram, erase them.

3) Explain that things leave our house because they are open systems. Things can move in and out of open systems.
4) Ask students to imagine their house as a closed system. Nothing can enter except for heat and light from the sun or leave, except reflected heat and light. Things in houses are the only resources available. Waste produced must stay in the house. Optional: Read the garbage poem by Shel Silverstein, “Sarah Cynthia Sylvia Stout.”

5) Ask: What would houses look like if nothing was allowed to enter or leave? (They would quickly become uninhabitable.)

6) Students may brainstorm ways to make “closed system” houses more livable.

7) Explain that the earth is a closed system, and nothing enters or leaves it, except sunlight. There is no place besides the earth to “get rid of” things.

Wrap-Up

1) Ask students to draw their school, and explain why it is an open or closed system.
2) Ask students to explain why the earth is a closed system.
Garbage

Thrift store
(Goodwill, etc.)

Consignment Store
Back of the Closet

Downgrade them to work shoes

(to wear when mowing or gardening)
### Just Look at Our Shoes

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many pairs of shoes per person, on average, do you and your group members own? Round to the nearest whole number and show your calculation.</td>
<td>Approximate 25 students are in this class. Using the figure from Column I as the average # of shoes per participant in this workshop, how many total pairs of shoes does this class own? Show your calculation.</td>
<td>Approx. weight of one pair of shoes = 24 oz. Using the answer from Column II, what is the approximate weight, in pounds, of the shoes that workshop participants own? Show your calculation. (Please round up.)</td>
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# Classroom Follow-up

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<tr>
<td>21 + 30 + 8 + 42 = 101 / 4 = 25</td>
<td>25 x 25 = 625</td>
<td>625 x 24 oz. = 15,000 oz./ 16 = 938 pounds</td>
</tr>
</tbody>
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**Extensions:** If time permits, ask your students to calculate the estimated number of shoes owned by the students at your school. You can also calculate the weight and volume. From there, you could estimate the number of shoes owned in your community, or in all of the classrooms in Iowa.
Shoe Story

Reader’s Theatre based on Shoe chapter
http://www.ceee.uni.edu/wastereduction.aspx
http://www.sightline.org/publications/books/stuff/stuff_resources/

Need:
4 volunteers
Map
Pins or post-it notes
Shoe for Person #3

Instructions: Read your part, with emphasis where appropriate. Type in red is not intended to be read out loud, but is instructions. Type in blue is to be read out loud, but is a reading strategy to get students to think about the story. It is not part of the story.

Moderator/Instructor: Information about shoes is from the book, Stuff: The Secret Lives of Everyday Things. This book was published by NW Environmental Watch in 1997. In your class, you could do this exercise, starting first by discussing life cycles of various products, then asking the students to predict what will happen in the lifecycle of a shoe.

Person #1: Google searches find that women in the U.S. tend to own more shoes than men (counting sandals, flip flops, boots, high heels, running shoes, etc.). One site said women ages 25-50 own an average of 40-60 pair, with men owning substantially fewer, on average. How many pair of shoes do YOU own?


Person #3: My pair of cross trainers (hold up one shoe) weighs about 1 pound and were manufactured by an overseas company that contracted with Nike, which is based in Oregon. (Mark Oregon on the map.)

Person #4: The story were about to tell is about Nike shoes because: Nike has been criticized for labor practices and Nike also promotes its environmental efforts. Therefore, a great deal of information is available about Nike shoe manufacturing compared to some other companies.

Person #3: The leather in my shoe was mostly cow leather. The cow was raised, slaughtered and skinned in Texas. (Map this.)

Person #1: The hide was then shipped to Korea for tanning. (Map this.) Labor costs and environmental standards are lower overseas. For centuries, tanning meant soaking hides in tannins from bark and vegetable extracts, but today many strong chemicals such as chrome and calcium hydroxide are used. The chemicals from this process are discharged into the Naktong River, and because of this much of South Korea’s tap water are not fit for human consumption.
Person #3: Ethylene is used to make my shoe’s midsole and the foam that gives my shoe its cushy feel. Ethylene is a colorless, slightly sweet-smelling—*but toxic*—gas. It was distilled from Saudi petroleum. *(Map this.)*

Person #2: A Taiwan factory—that gets its electricity from nuclear power—synthesizes petroleum and benzene to make rubber *(map this).* The rubber is then flown to Indonesia. *(Map this.)*  
*Now, this next step in the shoe’s lifecycle is easy to picture, so imagine this:* During the manufacturing process, machines cut up the sheets of rubber to make the grooved tread on the bottom of my shoe. Like too much batter in a waffle iron, some of the rubber oozes out the edges. *Can you picture that?  Like too much batter in a waffle iron, some of the rubber oozes out the edges.* This excess rubber used to be sent to landfills, but is now ground and made into rubber again. Nike has cut its rubber waste by 40%, saving 5 million pounds of rubber annually.

Person #4: A Japanese-made sewing machine *(map this)* is used by workers in Indonesia to sew the logo onto the shoes. Young Indonesian women cut, sew and glue uppers and soles together to make shoes. The air smells of paint and glue and temperatures are near 100 degrees. Like most workers, Suraya, one of the young women, wears cheap rubber flip flops. She would have to pay more than a month’s salary to buy the $75 shoes she helped make. She earned the Indonesian minimum wage of 23 cents an hour. *Can you picture this, too?*

Discipline is strict, sometimes abusive, in the factory, which is run by ex-military men from Korea. But Suraya knows not to complain about the pay or the illegal, compulsory overtime she sometimes works. She is replaceable…and speaking out could mean getting fired…The Indonesian government believes that even at $2/day, workers’ wages are too high for the country to compete with lower-wage nations like India and Vietnam. *(Optional: This would be an opportunity to compare and contrast wages and working conditions.)*

Person #1: International shoe companies argue that their presence in Asia directly benefits the workers, or that they cannot influence how workers are treated in repressive Asian countries. They also insist their factories comply with local government regulations.

Person #2: Another perspective comes from a 20-year-old working in an Indonesian shoe factory. She says that workers do not need foreign companies to come to Indonesia and take advantage of the government’s denial of human rights. *(The Think-Aloud reading strategy might be used here to ask students to make comments, comparisons and to think about how to help solve the problem.)*

Person #3: My shoes were hand stuffed with lightweight tissue and boxed in a 100% *recycled* and *unbleached* box made in New Mexico *(map this).* The empty boxes are shipped by freighter to eastern Asia *(map this)*, where the shoes are packed and returned to the U.S. for resale *(map this).*

Person #3: As I lace up my shoes, I notice a small tear over my big toe. At this rate, the pair won’t last a year. That’s much longer than my newspaper lasts, but still, maybe I can find my old needle and stitch up the hole before it grows. Maybe I can make my shoes last longer, walk more softly on the earth, and save $75 bucks, too.

END

Note: Ultimately, by voting with our pocketbooks for responsibly made products, consumers exert influences on manufacturing practices.