Reduce, Re-use, Recycle

THE PROBLEM

Students will understand some of the environmental consequences of waste disposal and consumption.

GRADE LEVEL

Elementary through Middle School

ACTIVITY

The amount of trash placed in landfills and dumps is a major concern. And, trash may last far longer than desired.

Before class, collect these items, which are often thrown away. Display and write the list of items on the board:

- aluminum soda can
- banana
- cigarette butt
- cotton rag
- glass bottle
- leather boot
- paper bag
- plastic 6-pack rings
- plastic jug
- rubber sole of a leather boot
- Styrofoam cup
- steel-tin can (soup or vegetable can)
- wool sock

Tell students that the materials you have collected are samples of items which are sometimes tossed away and end up in a landfill. Ask:

What will happen to these items if they end up in the landfill?

Which item do you think will take the shortest time to decompose?

Ask students to make their own "best guess" lists from shortest to longest decomposition time. Then if time permits, have the class vote; record their guesses on the board, and then give them scientists' best guess:

banana – *3 to 4 weeks*
paper bag – *1 month*
cotton rag – *5 months*
wool sock – *1 year*
cigarette butt – *2 to 5 years*
leather boot – *40 to 50 years*
rubber sole (of a boot) – *50 to 80 years*
tin can (soup or vegetable can) – *80 to 100 years*
aluminum can (soda pop can) – 200 to 500 years
plastic 6-pack rings – 450 years
plastic jug – 1 million years
Styrofoam cup – unknown? forever?
glass bottle – unknown? forever?

FURTHER EXPLORATION

Materials

Large cardboard box, the thrown-away trash, tape measure or yardstick, calculator

- Have students fill the large box with collected trash. Calculate the total amount of trash in the box. (height x width x depth = volume)
- If everyone in the classroom produced this same amount of trash each week, how much space would be used each year? (volume x students x 52).
- If all students' family members produced the same amount of trash each week, how much space would be needed? (volume x total people x 52)
- Compact the trash in the box (crush, chop up, etc), then calculate how much space would be needed.

- To give students a concept of large volume, measure the classroom or other venue and calculate its volume.

Connect to Engineering

Most of us care deeply about stopping pollution and protecting our natural resources. Imagine yourself having more than just a passion for saving our environment, but also possessing the actual know-how to do something about these alarming problems! Engineers make a real difference in the survival of our planet by finding ways of cleaning up our oceans, rivers, and drinking water, developing air pollution equipment, designing more effective recycling systems, or discovering safe ways to dispose of trash and toxic waste.

Tip: On *http://www.engineeryourlife.org/cms/Careers/Descriptions/Environmental.aspx* you will find more information on environmental engineering along with a short downloadable video featuring Daniele Lantagne, an environmental engineer who travels the world to teach safe drinking water practices.