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Products

from Natural Gas and Oil

Experiment

Polymer Plastic Recycling

Can differences in density be used to efficiently sort plastics for recycling?

Materials:

- Samples of six types of polymers (see Recycling Code chart), cut into small size and/or shape; samples of each kind for each group
- One styrofoam egg carton or several small containers per group to hold liquid
- Craft sticks or other stirrers per group
- Set of four liquids per group: water, vegetable oil, glycerin, and solution that is three parts 70% isopropyl rubbing alcohol to two parts water
- One copy worksheet per group:
Recycling Codes (see additional page)

Procedure:

1. Drop a piece of plastic into one of the liquids. If it does not sink immediately, push it gently down below the surface with the craft stick and release. Observe it until it stops moving.
2. Record whether it sinks or floats in that particular liquid.
3. Repeat with the same type of plastic in the other liquids and record.
4. Repeat steps one, two and three with samples of the other plastics.

Experiment, Continued

Polymer Plastic Recycling

5. Use the chart to determine the identity of your samples.
6. Notice the PETE and V give the same results. You can tell them apart by bending a sample. V will whiten when bent, but PETE will not.

Questions and Explanations:








1. How could the density testing be accomplished on a larger scale?
2. What kind of petroleum is used for these products?
How are they produced?
3. How much plastic is in our landfills?
How much could be recycled?
4. What are some of the petroleum polymer products that you use?
5. Does your community recycle? Why or why not?

Reflection:

- 1 What other ideas do you have for recycling plastics?

Experiment, Continued

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Recycling Codes		
Recycling Symbol	Name of Polymer	Sample Uses
	polyethylene terephthalate	soft drink bottle, carpets, fiberfill rope, scouring pads, fabrics Mylar tape (cassette and computer)
	high density polyethylene	milk jugs, detergent bottles, bags plastic lumber, garden furniture flower pots, trash cans, signs
	vinyl	cooking oil bottles, drainage and sewer pipes, tile, bird feeders institutional furniture, credit cards
	low density polyethylene	bags, Elmer's® glue bottles and other squeeze bottles, wrapping films, container lids
	polypropylene	yogurt containers, automobile batteries, bottles, lab equipment carpets, rope, wrapping films
	polystyrene	disposable cups and utensils, toys lighting and signs, construction, foam containers and insulation
	all other polymers	catsup, snack and other food containers, hand cream, toothpaste, and cosmetic containers