Recycling Code-Scavenger Hunt

Introduction

You are surrounded by plastic. Right now, there are countless objects around you that are made, at least in part, out of plastic. Do you have a cell phone, computer, or just about any other electronic device? Chances are the case is plastic. Most beverages, condiments, cleaning liquids, and automotive fluids come in plastic bottles. That's not all. furniture, storage containers, automobiles, and even many clothes contain plastic.

With the ever increasing use of plastic in everyday life, so too increases the amount of plastic that becomes waste. While a certain amount is recycled or burned to produce energy, the overwhelming majority ends up in landfills. As the challenges of dealing with plastic waste continue to increase, it becomes more and more important to understand plastics, the differences between different types of plastics, and how they are used.

The Challenge

Try to find at least three different examples of each type of plastic. Refer to the Plastic Recycling Numbers sheet included with this challenge to see the different types. Group the items you find by recycling number then make your own recycling chart from the items you collected.

Recycling Number for Polyethylene Terephthalate, but we just call him PETE.

STEP 1: Hunt for samples.

- Look for plastic items in or around your home.
- Each time you find an item, find it's recycling number.
- The recycling number is usually located on the bottom or the back.
- The number will appear in the middle of a triangle made of arrows.
- Try to find at least 3 different items for each number.

STEP 2: Catalog your samples.

Follow the template included with this challenge to create your own recycling chart.

(You may do this by hand or on a computer.)

NOTE: Refer to the Plastic Recycling Numbers sheet included with this challenge. It will help you find information you'll need for your own chart.

- Group your items by recycling number.
- For each group fill out the following information:
  - What type of plastic is it? (Abbreviation and full name)
  - How would you describe it? Describing plastic can be hard if you don't know what to look for. Here are some things to consider:
    - **Hardness-** Does it feel hard or soft? Can you press a fingernail or pen tip into it?
    - **Flexibility-** Is the plastic rigid or flexible? how easy is it to bend, or does it break instead?
    - **Finish-** What does the surface look like? Is it shiny, waxy-looking, or dull?
    - **Opacity-** How well does light pass through the sample? Judge opacity using the following scale:
      - Crystal clear- Samples look like glass. They may be completely clear or be colored.

    - Foggy- You can still see through the sample, but only shapes and vague color, no detail.
    - Translucent- You can't see through the sample, but it brightens when you put light behind it.
    - Opaque- You can't see through the sample at all. No light shines through the material.
  - Is the material recyclable?
  - Is the item reusable? (Aftermarket drink bottles, food storage containers and coffee mugs are a few examples of reusable items. The bottles beverages are sold in or the trays for frozen foods are usually intended for single use only!)
- What items did you find?

STEP 3: Showcase your samples.

There are a couple options for how to display your samples:

OPTION A- Build a presentation board.

- Find a piece of material large enough to hold all your samples. You may use whatever you have available. Here are some suggestions:
  - A piece of cardboard from a large box.
  - Several pieces of cardboard put together to make a large enough piece.
  - A scrap piece of plywood or fiberboard.
- Group your samples together by recycling number.
- Use hot-melt glue, epoxy, or even mechanical fasteners such as nails, screws, or nuts and bolts to attach your samples to the board.
- Clearly label each group with its recycling number.

OPTION B- Create a photo board.

- Group your samples together by recycling number.
- Take pictures of each group.
- Print the pictures and attach them to a large piece of paper, poster board or cardboard.
- Clearly label each group with its recycling number.

OPTION C- Create a digital photo board.

- Group your samples together by recycling number.
- Take pictures of each group with a digital camera.
- Import pictures into page layout software. Use what you are most comfortable with. Here are some suggestions:
  - Microsoft Word
  - Google Docs
  - Libre Office Writer
  - Adobe Illustrator
  - Corel Draw
  - Inkscape
- Clearly label each group with its recycling number.

Recycling Code-Scavenger Hunt

STEP 4: Report your findings.

Send your completed Plastic Recycling Number Chart to your teacher.

- If you completed the chart using a computer, send the file to the teacher.
- If you made your chart by hand, take a picture of the chart and send the picture instead.

Send your sample display board to your teacher.

- If you made your display using option A or option B, take a picture and send the picture to your teacher.
- If you made your display board using option C, send the file to your teacher.

Lessons Learned

Every year millions of tons (over 34 million as of 2017) of plastic are generated for use in products and packaging. Currently about 75% of that ends up in landfills. Plastic recycling codes are a standardized system for helping consumers recognize and identify plastics both for recycling purposes and so they can make more informed buying decisions.

Learning to identify different types of plastic and understanding each type's benefits and detriments is a powerful part of product and packaging design, as well as being useful to help manage your own environmental footprint.

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Recycle Number:							
Plastic Type: (Abbreviation)							
Plastic Type: (Full name)							
Your Description: **-** What is similar about the samples in the same group? - How is each group different from the other groups?							
Is it recyclable?							
Is it Reusable?							
Your examples:							

Plastic Recycling Numbers

Number	Type of Plastic	Description	Recyclability	Examples		
1 PETE	**Polyethylene Terephthalate** (PET, PETE)	• Heat-resistant and tough • Intended for single use applications • Inexpensive and lightweight • Barrier to gas and moisture	Recyclable / Not reusable	• Single-use bottled beverages • Salad dressing containers • Mouthwash bottles	• Peanut butter containers • Prepared food trays • Jelly jars	
2 HDPE	**High-Density Polyethylene** (HDPE)	• Tough and durable • One of the safest forms of plastic • Resistant to moisture and chemicals • Most commonly recycled	Recyclable / Reusable	• Milk and water jugs • Household cleaner containers • Plastic lumber	• Waste bins • Grocery bags • Cereal box liners	
3 PVC	**Polyvinyl Chloride or Vinyl** (PVC, V)	• Soft and flexible • Relatively impervious to sunlight and weather • One of the least recyclable plastics due to additives, contains numerous toxins	Not recyclable / Can be repurposed	• Food wrap • Plumbing pipes • Window frames • Flooring	• Shower curtains • Wire/cable insulation • Lawn chairs	
4 LDPE	**Low-Density Polyethylene** (LDPE)	• Tough and flexible • Considered less toxic than other plastics • Relatively safe to use	Not always recyclable / Reusable	• Dry cleaning bags • Squeeze bottles • Bread bags • Thin container lids	• Frozen food bags • Food wrap • Furniture	
5 PP	**Polypropylene** (PP)	• Tough and lightweight • Has excellent heat-resistance qualities • Serves as a barrier against moisture, grease, and chemicals	Not always recyclable / Reusable	• Bottle caps • Medicine bottles • Tupperware • Straws	• Packing tape • Some auto parts • Pails	
6 PS	**Polystyrene** (PS)	• Inexpensive • Lightweight and easily-formed plastic • Breaks up easily • May leach styrene into food products	Not commonly recyclable / Not commonly reusable	• Disposable foam cups • Carry-out containers • Egg cartons	• Cafeteria trays • Packaging foam • Disposable cutlery	
7 OTHER	**Other** (O)	• Examples: BPA, Polycarbonate, and LEXAN • Has potential for chemical leaching into food or drink products • New generation of compostable plastics are being developed to replace polycarbonates	Not standardized / Not standardized	• Baby bottles • Storage containers • 5-gallon water cooler bottles	• Headlight lenses • Safety glasses • CDs	

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