

Workshop #1 Introduce Plastic and investigate it's material properties and understand student concepts on density. Explore density;

Purpose

- Introduce the problem of plastic recycling;
 - Plastic as a material (in 'formed' form and 'mixed'); and
 - Properties of plastic. What is the way to determine their difference?
 - When still in one piece (Plastic Identification Code); and
 - When all mixed up and dirty and some not marked as the standard is not compulsory? (Density is one way).
- What is Density?
 - Student conceptions of density; and
 - Multiple representations of density.

Safety

- All plastics are to be washed with soap and have no residue;
- Students are to be informed to be careful of sharp edges on cut up plastic.

Materials

- Plastic of the following types (In there 'purchased' forms, i.e., as containers etc. Not cut up):
 - 1 PET (Polyethyleneterephthalate) - soft drink and fruit juice bottles;
 - 2 HDPE (High-density polyethylene) - milk bottles or shampoo containers;
 - 3 PVC (Polyvinyl chloride or plasticised polyvinyl chloride) - cordial, juice or squeeze bottles;
 - 4 LDPE (Low density polyethylene) - garbage bags and bins;
 - 5 PP (Polypropylene) -ice cream containers, take-away food containers and lunch boxes;
 - 6 PS (Polystyrene) - yoghurt containers, plastic cutlery, foam hot drink cups.
 - 7 Other - all other plastics, including acrylic and nylon.
- Plastic of the following types all cut up and mixed in a bucket:
 - 1 PET (Polyethyleneterephthalate) - soft drink and fruit juice bottles;
 - 2 HDPE (High-density polyethylene) - milk bottles or shampoo containers;
 - 3 PVC (Polyvinyl chloride or plasticised polyvinyl chloride) - cordial, juice or squeeze bottles;
 - 4 LDPE (Low density polyethylene) - garbage bags and bins;
 - 5 PP (Polypropylene) -ice cream containers, take-away food containers and lunch boxes;

- 6 PS (Polystyrene) - yoghurt containers, plastic cutlery, foam hot drink cups.
- 7 Other - all other plastics, including acrylic and nylon.
- Buckets / containers to hold the different plastics.
- Plastic Identification Code printout.

Setup

- A set of 'original' plastics and 'mixed cut up' plastics.

Approach / Timing

Time	Duration (min)	Task	Description
1400	5	Introductions/Welcome	Introductions
1405	5	Get into 'Design Teams'	Teams of 3-4 students.
1410	5	Watch Crash Course Kids Video on Engineering Process	https://www.youtube.com/watch?v=fxJWin195kU
1415	5	Introduce the Task	We have been tasked by the Government to design a way to sort plastic at the local recycling center. Questions? What do we need to think about for this design? What do the kids already know about recyclable plastic?
1420	15	Introduce Plastics ('original form')	Ask students to see if they can tell the difference between the different types. Properties could include: <ul style="list-style-type: none"> ● Appearance; ● Colour; ● Flexibility; ● Texture. Likely talk about the Plastic Identification Code.
1435	15	Introduce Density (Depending on timing)	Get an understanding of students concept of density. Can use multiple modes (role-play, pictures, words)
1450	5	Clean up / Pack Up	
1455	0	Back to Class / Finish	

Information for Coordinators of Workshop

This covers background information that is not directly meant for students. It is for coordinators to read to give them additional information.

Plastic Recycling

Plastic Identification Code

- The **Plastic Identification Code** is a simple "1-7" numbering system that identifies the resin composition of plastic containers and other items intended for recycling. The numbering system is:
 - 1 PET (Polyethyleneterephthalate) - soft drink and fruit juice bottles;
 - 2 HDPE (High-density polyethylene) - milk bottles or shampoo containers;
 - 3 PVC (Polyvinyl chloride or plasticised polyvinyl chloride) - cordial, juice or squeeze bottles;
 - 4 LDPE (Low density polyethylene) - garbage bags and bins;
 - 5 PP (Polypropylene) - ice cream containers, take-away food containers and lunch boxes;
 - 6 PS (Polystyrene) - yoghurt containers, plastic cutlery, foam hot drink cups.
 - 7 Other - all other plastics, including acrylic and nylon.
- The Plastic Identification Code is a voluntary coding system that was originally designed for businesses that collect, recover and recycle such goods.
- **IMPORTANT POINT:** Just because a plastic item has a recyclable symbol on it **DOES NOT MEAN** that it can be recycled in your area (i.e., what can be put in the recycling bin).

Plastic Recycling Information Specific to ACT

Plastic types 1, 2, 3 and 5 are generally accepted at ACT's Materials Recovery Facility. Specifically, the following can not be put in the yellow recycling bin:

- 4 LDPE (Low density polyethylene) - garbage bags and bins;
- 6 PS (Polystyrene) - plastic cutlery, foam hot drink cups, takeaway containers, and foam black spongy trays that meat comes on; and
- 7 Other - all other plastics, including acrylic and nylon.

However, they are recyclable (Just not in the yellow bin).

Why are they not recyclable for kerbside?

- 4 LDPE: These plastics can get stuck in the sorting equipment in recycling facilities causing it to stop or break.

Where does the recycling go in the ACT?

Go to ACT's Materials Recovery Facility (MRF).

MYTHS of recycling plastic

- That the containers needs to be washed or rinsed. This is not true, the just need to have must of the food stuffs removed. TAMS marketing is “Just shake it or scrape it”