

LESSON: PLASTIC CYCLE

Activity 1: The Diversity of Plastic

U of T



Trash Team

OVERVIEW

This activity will introduce you to plastic as a diverse material by learning about some of its different characteristics. You'll also explore many different examples of plastic items we use everyday, and whether they are designed to be used just once or reused multiple times.

LEARNING OBJECTIVES

After completing this activity, participants will be able to:

- Understand that there is a large diversity of plastic and that this influences how they are managed as waste.
- Compare different examples of plastics and describe if they are designed to be single-use or used for a long time (multiple uses).
- Describe some common characteristics of plastic.

SETUP AND MATERIALS

This activity takes approximately 25 minutes and is done in 2 parts.

- **Print a copy of the worksheet (or recreate your own on scrap paper) and grab a pen or pencil.**
 - The same worksheet is used for both Parts 1 and 2.
 - Note: Part 1 has a special bonus experiment with its own set of instructions.
- **Part 1: Are all plastics created equal?**
 - A timer or stopwatch
- **Part 1 - Bonus Experiment: Is it a Plastic Cup or a Paper Cup?**
 - Instruction sheet
 - Single-use paper cup
 - Large clear bowl filled with water
- **Part 2: How do you describe plastic?**
 - 4 pieces of scrap paper to make signs or print one of our sign templates.
 - On each paper print one of four words: OPAQUE, CLEAR, RIGID, FLEXIBLE
 - Find an assortment of **at least** 5 different plastic products from around the home.
 - Look for plastic products that feel and look different from one another (ie. different colour, different size, different weight etc).
 - *Suggested items include products like: cling wrap, foam, candy or granola bar wrappers, clamshell packaging, plastic cutlery, plastic bottles, sandwich bags, shopping bags, plastic straws, yogurt containers etc*
 - **TIP:** Have a look in the recycling bin!

LESSON: PLASTIC CYCLE

Activity 1: The Diversity of Plastic

U of T



Trash Team

PART 1: ARE ALL PLASTICS CREATED EQUAL?

INSTRUCTIONS

- Provide participants with a copy of the worksheet.

1. Start by learning about plastic in general.

- Complete the table on page 1 of the worksheet by following these three steps:
 - **Step 1:** Set a timer for 1 minute and ask participants to look around the room and write down as many different plastic items they can see. Once finished, ask them to look back over this list to think about how they knew each item was plastic and what different characteristics they have (Are they all the same colour? Can you stretch some and not others? etc).
 - **Step 2:** Look back and write next to each item if they think it was designed to be used more than once or thrown away after the first use (ie. single-use). **Add a checkmark next to items that are single-use.**
 - **Step 3:** Look back at items that were identified as single-use and ask them to write down some alternative options that would help to reduce the use of this item.

2. Now discuss hidden plastics by investigating a product where plastic is not easy to see.

- Ask participant to think about a paper coffee cup from a local cafe when ordering to-go. Share that while many call it a paper cup, there is actually plastic hiding somewhere inside the cup.
- Ask participant to try and guess where that plastic is hiding within the cup and to record this on page 2 of the worksheet.
 - **Answer: The liner is a thin plastic! It's made of a type of plastic called polyethylene and makes these cups very challenging to recycle, so they usually end up in the landfill.**

BONUS EXPERIMENT: Is it a Plastic Cup or a Paper Cup?

Take a paper coffee cup and leave it in a bowl of water for 2 months to reveal the polyethylene lining as the paper disintegrates. Document the progress with photos and written observations.

3. Conclude by learning about microplastics.

- Ask participants to write down some examples of plastic litter they have seen in the environment.
- Ask participants to review this list and then describe the size range of litter items they have noticed.
- Introduce that some plastics exist that are so small we may not even notice them at first, these are called **microplastics**.
 - **Definition: Microplastics are less than 5 mm in size (as large as your pinky nail or as small as the width of a strand of hair). They are either made that small on purpose or found in the environment after larger pieces of plastic break up into smaller pieces of plastic.**
- Refer to the two examples of microplastics pictured on worksheet, microbeads and microplastic fragments from Humber Bay in Toronto. These are just two examples of microplastics.
- The first photo shows microbeads. These used to be an ingredient in personal care products like face scrubs and toothpaste. They were banned in Canada on July 1, 2018.
 - Have participants write down where they think these plastics would end up in the environment after being used.
 - **Answer: Usually down the drain and then into our rivers and lakes via a wastewater treatment plant.**
- The second photo shows a jar of microplastic fragments sampled near Humber Bay in Toronto.
 - Have participants write down why these are challenging to clean up once in the environment.
 - **Answer: Some microplastics are so small they can't be seen, and those that are visible are still very small and hard to pick out on their own.**

LESSON: PLASTIC CYCLE

Activity 1: The Diversity of Plastic

PART 2: HOW DO YOU DESCRIBE PLASTIC?

INSTRUCTIONS

- Provide participants with a copy of the worksheet.

Now that participants have explored different examples of plastic, they'll learn about a few different ways that we can categorize it.

- Collect your assortment of at least 5 plastic products and the four signs you made or printed.
- Place each of the four signs in different corners of the room. You should have a different sign in each corner of the room.
- Set the assortment of plastic products in a central location and ask participants to list these products on page 4 of the worksheet.
- Explain to participants that there are many different ways you can categorize plastic, and we'll explore 4 general ones. Share each of the below definitions with them.
 1. **OPAQUE:** This means an item is made up of solid colours that you can't see through
 2. **CLEAR:** This means you can easily see through the item
 3. **FLEXIBLE:** This means an item is really easy to bend or stretch and probably pretty thin
 4. **RIGID:** This means an item is really thick and hard to bend.
- You will now ask participants to match the plastic products to each of their characteristics by moving from sign to sign and physically placing items next to the sign that matches.

TIP: Ask participants to think of a fun way to move each time they go to a new sign! Hop like a bunny, pretend they are a raccoon going through the garbage, move very slowly like a sloth!

- Start with the **OPAQUE** sign, placing any **opaque** products from your pile next to the sign.
- Repeat with **CLEAR** sign, placing any **clear** products from your pile next to the sign.
- Repeat with **FLEXIBLE** sign, placing any **flexible** products from your pile next to the sign.
 - **If a plastic product is already next to the OPAQUE or CLEAR sign, you can simply move it here now.** This demonstrates that plastic products can have more than one characteristic.
- Repeat with **RIGID** sign, placing any **rigid** products from your pile next to the sign.
 - **If a plastic product is already next to OPAQUE or CLEAR, you can simply move it here now.** This demonstrates that plastic products can have more than one characteristic.
- Once all products have been moved, there should have been some that were moved to more than one sign. This shows just how complex plastic is as a material and that most products have more than one characteristic.
- Ask students if any of their items fit more than one characteristic and to list them on page 4 of the worksheet.
- Ask students to share how they think the complexity of plastic products might have an impact on their waste disposal and write this down on page 4 of the worksheet.

LESSON: PLASTIC CYCLE

Activity 1: The Diversity of Plastic



FINAL REFLECTION

Now that you have completed all parts of the activity, it's time to reflect back on what participants have learned.

- Have participants return to the last page of their worksheet to answer the questions below.
 - Can you list some examples of plastic products that are designed to be durable and long lasting?
 - Can you list some examples of plastic products designed to be used for a short time?
 - What are some words you can use to describe the different characteristics of plastic? Can you share what each of these words mean?
 - What might happen to plastic left in the environment for a long time?

Coming up next: We'll learn more what happens to plastic items when we're done using them in **Activity 2: A Closer Look at Plastic.**