

LESSON: IMPACTS OF PLASTIC ON ECOSYSTEMS



Activity 1: Get to Know Your Ecosystem

OVERVIEW

This activity will introduce participants to what an ecosystem is as they learn about the widespread impact of plastic pollution on ecosystems.

LEARNING OBJECTIVES

After completing this activity, participants will be able to:

- Understand the widespread impact of plastic pollution on ecosystems.
- Define and provide examples of different ecosystems, including the common wildlife species found within each of them.

SETUP AND MATERIALS

This activity takes approximately 20 minutes.

- Print a copy of the worksheet and grab a pen or pencil.
- Print out each of the 4 ecosystem posters (you may use sticky tac or other removable adhesives to place posters on the wall, or simply place posters on nearby furniture).
- Print out individual wildlife cards found on the last page of the ecosystem posters document. Participants will match these to each ecosystem during the activity.
- **Bonus Experiment** - Download instructions to learn about how plastic impacts plants. You'll also need 2 plant pots, 2 seedlings of your choice, and black or solid-coloured plastic sheeting.

INSTRUCTIONS

1. First participants will learn about ecosystems.

- Ask participants if they have heard of an ecosystem before and ask them to share what they think it might be before sharing the definition.

Definition: A natural community of interacting living organisms (like plants and animals) and their environments.

- Explain to participants that a good example of an ecosystem would be a lake. Ask them to guess what all the parts of a lake ecosystem would be and to write these on page 1 of their worksheet. Answers might include fish, water, sediment, worms, insects, algae, etc.
- Explain to participants we're now going to learn about four different ecosystems and some of the ways plastic pollution may affect them.

2. Illustrate the widespread impact of plastic on wildlife in different ecosystems.

- Place posters on four easily accessible areas around the room
- These posters feature wildlife found in four different ecosystem examples, along with examples of plastic pollution, and scientists from the U of T Trash Team who studying the topic.
- Explain that changes in an ecosystem can affect the relationship between living organisms, like wildlife, and their habitats. Share that these changes might be natural (like a volcano erupting) or caused by humans (like littering).
- Share that we'll learn more about a common human-caused problem in ecosystems, plastic pollution and littering. In this activity, they will be visiting four different ecosystems to discuss how plastics can affect plants and animals and how we can help to stop plastic from causing problems for ecosystems.

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INSTRUCTIONS (CONTINUED)

- Lead the participants from poster to poster in this order:
Stream → Deep Sea → Polar → Urban
- For each ecosystem, ask participants to describe what things are a part of that ecosystem. Then tell participants to guess which of the four wildlife cards matches the ecosystem they are learning about.
 - **Stream = Grizzly bear**
 - **Deep Sea = Jellyfish**
 - **Polar = Polar bear**
 - **Urban = Raccoon**
- While at each ecosystem, read text on poster or ask the participant to read the poster out loud to highlight human impacts on the ecosystem, some ways plastic might interact with wildlife, and young scientists from our team working to understand the effects of plastics on each ecosystem.
- **Suggested prompts:**
 - **Stream Ecosystem:** Our first ecosystem is a stream ecosystem. Have you ever seen one of these types of ecosystems? Stream ecosystems are home to many different plants and animals. I have some animals here that need to return to their ecosystems, which do you think belongs in the stream ecosystem? [Have participants choose wildlife card]. Look at the pictures carefully. Do you see anything else in this ecosystem? Yes, plastic pollution! Do you think plastic is a human-caused change to ecosystems or a natural change? Plastic pollution can be present in stream ecosystems and can impact stream organisms. Here is one of the University of Toronto Trash Team members, Scientist Rachel. Rachel studies the impacts of plastics on animals in stream ecosystems.
 - **Deep Sea Ecosystem:** Our next ecosystem is a deep sea ecosystem. Have you ever visited this type of ecosystem? Probably not since these are found at the very bottom of the ocean! What types of animals can we find in this ecosystem? [Have participants choose wildlife card]. Does anyone see any human-caused changes to this ecosystem? I think I do. More plastics! Do people live in this ecosystem? No. So how do you think plastics get here? Plastics can also affect organisms in the deep sea. Here is another one of the University of Toronto Trash Team members, Scientist Clara. Clara studies the impacts of plastics in deep-sea organisms.
 - **Polar Ecosystem:** For our next ecosystem, we're traveling to the far north and far south, to the ends of the earth, to talk about polar ecosystems. These ecosystems are the ones we find at the north and south pole. Though not many people live in polar ecosystems, a lot of animals do! What types of animals do you think live in this ecosystem? [Have participants choose wildlife card]. Do you see any plastic here? Yes, plastics are even found in polar ecosystems. How are these animals impacted by the plastic in their ecosystem? They can accidentally eat it or become entangled in it. Scientist Bonnie, one of the University of Toronto Trash Team members, studies the fate of plastics in polar ecosystems.
 - **Urban Ecosystem:** For our last ecosystem, we're staying closer to home. This is an ecosystem a lot of us know and probably spend a lot of time in – it's an urban ecosystem! Lastly, we have... [place last wildlife card on poster]. People are a part of this ecosystem too! Have you've seen plastic in this type of ecosystem? Plants and animals in this ecosystem can be impacted by plastics too. Has anyone ever been to a clean-up before? At community clean-ups citizen scientists, including people like you, help collect information about the types of plastic found in urban ecosystems. Cleanups can help prevent plastic from entering the environment and impacting all of the ecosystems we've visited today.

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U of T



Trash Team

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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 their worksheet to answer the questions below.
 - What did all the ecosystems you learned about have in common? (They all had plastics)
 - How do you think plastics get into these ecosystems?
 - Do you think wildlife in these ecosystems are affected by plastic? If yes, how?
 - How can we prevent plastic from ending up in ecosystems?
 - Can you think of other ways that plastic pollution can impact wildlife and plants?

BONUS EXPERIMENT: How Does Plastic Impact Plants?

Do you know that plastic can also impact plants? Plastic in water or on land can block the sun and inhibit the growth of the plants. We invite you to do a bonus experiment to understand the impact of plastic on plants.

Coming up next: We'll learn more about what happens when wildlife become entangled in plastics in [Activity 2: Oh no, I'm Entangled!](#)