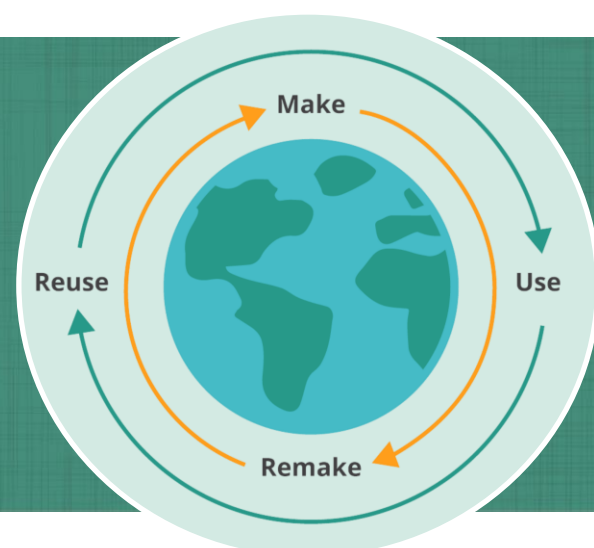


Plastics in Our Oceans

#Eco360
Activity
Grade Level: 9-12



Main Objectives

Learners will learn about the impacts of plastic in oceans. Learners will learn about the production of microplastic and how it ends up in our environments. Learners will explore the negative effects of macro and microplastics in our water bodies, in particular our oceans.

Learning Outcomes

By the end of this activity, learners will:

- Describe what are microplastics and how are they generated
- Identify why and how microplastics end up in the environment, in particular our water bodies
- Describe the negative impacts of macro and microplastics in oceans
- Identify how they can take action to eliminate microplastics from entering our water bodies

Curriculum Connections

Alberta

Grade 8 Unit E: Freshwater and Saltwater Systems

- 4. Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues

Biology 20, 30 All Units

- STS outcome (science, technology and society): explain how science and technology have both intended and unintended consequences for humans and the environment

Ontario

Grade 9 Biology (B1.2, B2.4, B3.5)

Grade 9 Geography

- B1. The Physical Environment and Human Activities: analyse various interactions between physical processes, phenomena, and events and human activities in Canada.
- C1. The Sustainability of Resources: analyse impacts of resource policy, resource management, and consumer choices on resource sustainability in Canada

Length of Activity

2 hours

Materials List

Internet-enabled device

Topic backgrounder

Eco 360 notebook (we recommend asking learners to maintain a notebook for this program to write down reflections as they go through the program)

Step 1: Using the backgrounder, explain to learners how plastic end up in our oceans

Differentiate between micro and macro plastics, and explain how both affect marine life in our oceans.

Step 2

Watch these two videos with your learners to understand how plastics impact our oceans and why they are harmful for our oceans.

- a. Plastic Pollution Crisis: How waste ends up in our oceans?
<https://www.youtube.com/watch?v=MNFUwVcpZAI> (4:26 minutes)
- b. What happens to microplastics in the ocean?
<https://www.youtube.com/watch?v=Y0Ks8oSUgIs> (3 minutes)

Step 3: Using the backgrounder, introduce ocean currents and ocean gyres, and how they distribute plastic around the globe.

Continue on to watch the video below on ocean currents:

- a. Alien Deep: Ocean Conveyor Belt
<https://www.nationalgeographic.org/media/ocean-currents-and-climate/> (2:33 minutes)
- b. Use the resource below to look at major gyres in our oceans and how they have become garbage patches
<https://www.nationalgeographic.org/encyclopedia/ocean-gyre/>
 - i. Slide 1: Subtropical Gyres and Associated Ocean Currents - review the location of these gyres with the learners
 - ii. Slide 6: Garbage Patches - review the garbage patches in the ocean, zoom in to see the size of the patches
 - iii. Slide 8: Great Pacific Garbage Patch - review the Great Pacific Garbage patch. This is close to home for Canadians, spend some time reflecting on how plastic debris can continue to float in this gyre for years as there is a lack of movement in the region.
 - iv. Watch a short documentary to further explore the problem - The Great Pacific Garbage Patch Is Not What You Think It Is:
<https://www.youtube.com/watch?v=6HBtI4sHTqU> (8 minutes)
- c. Put learners in groups of 3 - 5. Ask learners to reflect on the questions below by creating a mind map of how plastic waste enters the oceans, its journey from there and its impacts on marine life. Learners can use the free online tool MindMeister for this activity -

- <https://www.mindmeister.com>
 - i. On the main page, create a login using a Google Account.
 - ii. Follow the instructions in the tutorial to get mapping.
 - iii. Ask learners to add the topic name "Plastic in Our Oceans" to their mind map and continue on to adding the following subtopics as questions. Have learners explore and add their thoughts to each question. Learners are also encouraged to add any research links they may want to reference and adding photos as they see fit. Learners are encouraged to be creative and connect all the concepts they have covered in this activity.
 - iv. 'Plastic in Our Oceans' mind map questions:
 1. What are the sources of plastic?
 2. How do they make their way into our oceans?
 3. What happens to them once they enter the ocean?
 4. How do the ocean currents distribute plastic?
 5. What happens once the debris enters ocean gyres?
 6. What happens to the microplastic in the ocean?
 7. How is marine life impacted by the plastic in the ocean?

Step 4: Conclusion

Have each group present their mind maps to the class highlighting their key findings. Learners may also print their mind maps for the educator to display in class.

Step 5: Take Action

Share with learners stories from communities across Canada on how they divert plastic waste from ending up in our water bodies and making its way to our oceans. Can your learners take similar action to stop plastics from ending up in our water oceans? Ask your learners to share their ideas with their network on social media and don't forget to tag us @Greenlearning

- a. Georgian Bay Case Study (5-minute reading):
<https://georgianbayforever.org/microplastics-collingwood-2/>
- b. Caring for Our Watersheds, various initiatives across Canada (5-minute reading)
<https://caringforourwatersheds.com/student-actions/>
- c. Vancouver Clean Shoreline Community (5-minute reading):
<https://www.aquablog.ca/2017/10/vancouver-becomes-second-official-clean-shoreline-community/>
- d. City of Lethbridge River Conservation Study (3 minute reading):
<https://globalnews.ca/news/5148087/conservation-efforts-making-a-difference-in-lethbridge-river-valley-study/>

Extension Idea

In our research we came across an excellent activity provided by 5Gyres that can be done as an extension activity to this topic. Click on the link [here](#) to view and download the activity “You Are What You Eat” on page 59.