

Plastic Education Kit

A resource guide for educators leading change

ELEMENTARY SCHOOL

In partnership with

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada



TABLE OF CONTENTS

CLICK ON SQUARE
TO ADVANCE
TO LESSON PLAN

LESSON 1
HOW PLASTIC
TRAVELS TO
THE SEA

LESSON 2
PLASTICS IN THE
FOOD WEB

LESSON 3
TRAVELING PLASTIC
AND POLLUTIONS
SOLUTIONS

APPENDIX

**We acknowledge that our work spans across the lands of many Indigenous Peoples.
We understand that collaborating with Indigenous communities and intertwining
Indigenous ways of knowing into our work is essential to decolonizing
ocean conservation and realizing the full spectrum of benefits to both people,
the land, and the ocean.**

INTRODUCTION

Help us inspire our youth to break the plastic pattern... and protect and restore our ocean.

Around 11 million tonnes of plastics leak into the ocean each year. This is equal to a dumping a garbage truck load of plastic into the ocean every minute! At this rate this number may triple by 2040.

But why does the ocean matter?

No oceans, no us:

- Our oceans produce over 50% to 80% of the oxygen we breathe.
- Our oceans control and regulate the climate, weather, and temperature.
- Roughly 40% of carbon dioxide gets absorbed by our oceans.
- Over one billion people rely on seafood as their primary source of protein.

Why is plastic pollution a problem?

- More than 360 million tonnes of plastic are produced every year.
- 40% percent of all plastic produced is designed for single use.
- Plastic never disappears, instead it breaks up into smaller pieces (microplastics), absorbing other pollutants and releasing these poisons along the food chain as some animals mistake the microplastics as food.
- Over 800 marine and coastal species are impacted by plastic pollution.
- Plastic and other forms of pollution are ending up in our marine life, making its way into the food chain. When plastic is in the food chain, it ends up in our bodies when we eat fish and other seafood.
- Other toxins from plastic disposal are ending up in our bodies (toxins from other chemicals and pollutants attaching onto the microplastics)
- Plastic is in our tap and bottled water, seafood, soil and in the air we breathe.

DEAR EDUCATORS

The oceans, and the interconnected cycle of water and waterways, are vital to all living things on Earth. Tragically, the health of our oceans, and by extension the well-being of all life on Earth, is at risk due largely to the impacts of human activity. Plastic is pervasive in our oceans and it's going to take a deep, transformational change in humanity's consciousness and activities to ensure healthy, sustainable life on this planet.

We believe this is possible. But we need your help! Our youth need to be aware of their own plastic use and empowered to take action that will have a positive impact on the environment around them. We recognize that individual action should be coupled with systemic change, so we aim to engage students through active approaches and creative problem solving. Through these lessons, we hope youth will become leaders of change - starting in your classroom. Thank you for helping us break this pattern.

Each lesson follows the same format:

- First students consider **Critical Questions** in parallel with engaging Activities informed by Western Science and Indigenous Knowledge.
- Next the **Thought Book** will prompt students to journal about each Lesson. Through this reflection students consider their role in mitigating plastic pollution and consider various perspectives on these issues.
- Finally, students are encouraged to become change makers within their community. Each lesson offers ways to **Take Action** as well as inviting educators and students to create their own.

Keeping in mind that systemic change is a crucial and necessary step in ending plastic pollution, this kit aims to empower youth to learn, inspire, and shift habits to contribute to solving the plastic crisis.





LESSON ONE: HOW PLASTIC TRAVELS TO THE SEA

BACKGROUND

Water is everywhere! It covers 71% of the earth's surface and 97% of water is found in the ocean. There are five major ocean basins around the world and all these basins together form one big world ocean. Water in the ocean continuously flows across the globe with movement from waves, tides, and the rotation of the earth. This movement helps to maintain balance in the world and keeps the planet healthy by circulating heat and nutrients. In this lesson, students explore a brief history of plastic and learn how it is a threat to healthy ocean ecosystems. Furthermore, they will investigate how water within the ocean moves across waterways, carrying animals, plants, nutrients, and unfortunately, plastic.

Indigenous communities are forced to adapt to many environmental pressures while simultaneously fighting to sustain and cultivate their Traditional Ecological Knowledge (TEK). The threat of TEK's extinction is an ongoing danger to many Indigenous populations, exacerbated by the direct and daily impacts of climate change and man-made destruction such as plastic pollution. In this lesson, students will contemplate the ongoing impact that plastic pollution and related environmental issues have on Indigenous populations around the world.

OBJECTIVES

Students will be able to:

- Develop a sound understanding of how plastics move across land and end up in the ocean.
- Clearly understand the impacts plastic can have on the ocean

CRITICAL QUESTIONS

1. How might we better show love, care, and respect for the ocean and all it provides to us?
2. How can we learn from Traditional Ecological Knowledge to help us solve the world's plastic problem?
3. How could we prevent plastic from entering the ocean?

MATERIALS

- Student Workbook
- Pen/Pencil
- Audio visual system

ACTIVITIES

Engage

1. On the board, write out the classes answers to the following prompts:
 - What do we know about plastic pollution?
 - What do we wonder about plastic pollution?
2. After a class viewing of [A Whale's Tale | Hope Works](#), discuss the following:
 - How the movie made you feel?
 - How is plastic was affecting the animals in the video?
 - What did the animals and humans do about plastic pollution?
 - What else can humans do about plastic pollution?
 - In this room, what can you see that is made from plastic?
 - Could it have been made from another type of material?
3. Bring the students into a circle. Discuss how water has a cultural importance to Indigenous communities.
 - Explain that water is used in Indigenous ceremonies and has "life-giving forces" and that they believe all aspects of creation are interrelated with it.
 - Tie in the First Peoples Principles of Learning: Learning supports the well-being of the self, the family, the community, the land, the spirits and the ancestors and learning involves recognizing the consequences of one's actions.
 - Talk to your students about Traditional Ecological Knowledge (TEK) and how it helps, alongside science, with finding solutions to conservation issues. To prepare, explore [Weaving Traditional Ecological Knowledge into Biological Education: A Call to Action, Robin Wall Kimmerer](#)
4. Organize a schoolyard pickup.
 - Using gloves and going over what is safe to pick up and what we should leave on the ground, challenge students to find at least 3 pieces of plastic garbage.
 - Keep track of what you find as you're collecting or, at the end, look at the garbage you gathered, taking note of what types of garbage (wrappers, juice boxes, etc.) were most littered in your schoolyard. (Workbook page 4).

5. Have the students draw the items they found (Workbook page 3). Play the song [Reduce, Reuse, Recycle](#). Discuss the differences between these.
6. Have the students complete the chart based on the plastic garbage they found (Workbook page 4). Ensure the students understand that there is always a wiser choice to make when throwing away plastic litter. Check out what can go in the recycling bin in your municipality.

Resources

WATCH ▶ CBC Kids: [A Whale's Tale | Hope Works](#)

LISTEN ▶ Play the song: [Reduce, Reuse, Recycle](#)

WATCH ▶ Ocean Wise's video: [Take The Pledge](#)

FOR EDUCATORS ▶ [Weaving Traditional Ecological Knowledge into Biological Education: A Call to Action](#), Robin Wall Kimmerer

THOUGHT BOOK

Through drawing and/or journaling, students will explore their understanding of plastic pollution and its impact on ocean health.

Reflect

1. How does water help you? Think about 5 ways you enjoy water.
2. How might we better show love, care, and respect for the ocean and all it provides to us?
3. How could we prevent plastic from entering the ocean?

TAKE ACTION

→ Watch the Ocean Wise video [Take The Pledge](#) and take the pledge as a class.

THE WHY To stop plastic pollution, we can try to use less plastic. Buying less plastic is a great first step. Putting plastic in the recycling bin (or garbage), instead of littering, will keep it out of the ocean. This helps ocean animals!



LESSON TWO: PLASTICS IN THE FOOD WEB

BACKGROUND

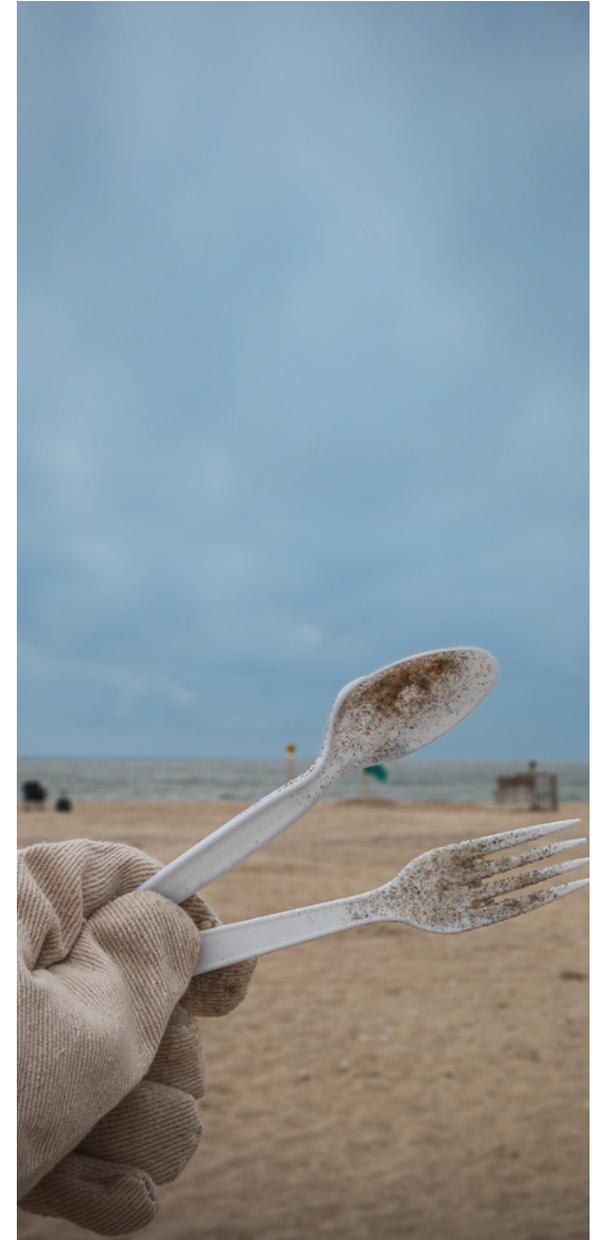
Ocean ecosystems are numerous and diverse. They are defined by environmental factors and by the organisms that live under the water. Environmental factors include available oxygen as well as nutrients, salinity, temperature, pH, light, pressure, substrate, and circulation. Ocean organisms range from microbes and invertebrates, to fishes, marine mammals, plants, and birds. Ocean ecosystems are interconnected and impacted by environmental factors, including plastic pollution.

A great variety of plastics can be found throughout the ocean, with microplastics being the most pervasive. Microplastics can be found as small fragments, sheets, fibres, pellets, and granules, and can negatively harm every aspect of the ocean ecosystem. Indeed, it was shown that microplastics are being eaten by species of zooplankton, highlighting the vulnerability of ocean food webs and the potential for microplastics to get into Indigenous, commercial, and recreational seafoods. Furthermore, there is a concerning trend of wildlife ingesting microplastics in seabirds, whales, turtles, seals, and more. The best way to reduce this harm to humans, animals, and other organisms is to remove plastic, and other litter, in and around our waterways (*and prevent it from getting there in the first place!*)

OBJECTIVES

Students will be able to:

- Understand the ways that plastic litter impacts an ecosystem and the animals and other organisms within it.
- Develop a clear understanding of how plastic pollution negatively impacts ocean health.



CRITICAL QUESTIONS

1. What are all the different ways that plastic impacts animals and ecosystems in our oceans?
2. How does plastic and/or microplastic pollution impact ecosystems?
3. What are steps you can take to help reduce plastic pollution/litter in your school?

MATERIALS

- Student Workbook
- Pen/Pencil
- Audio visual system
- Access to computers for research (in small group)

ACTIVITIES

Engage

1. Watch video; [Saving Sea Lions: Why Marine Plastic Matters](#) and do one of the following activities
 - In small groups, have students answer the questions and discuss the methods used to assist the sea lions (see Workbook page 6).
 - Discuss the questions (in the student workbook) together. Have a meaningful conversation about this marine plastic problem.
2. Discuss 'ecosystem' and 'biodiversity' as a group. Have students cut out animals and plants to first place on a provided ecosystem (see student workbook page 7). Discuss the final placements of all animals and plants, students can then pair up and share their ecosystems. Encourage them to share why they chose those placement spots!
 - Now introduce various pieces of plastics and consider microplastics for them to add in their ecosystem, where would they find it and how would this impact the animals and their ecosystems.
 - *Example:* How would it get there? Do they belong there? Would the animals eat the plastic? How would that impact the food chain?
3. In small groups, invite students to choose a marine animal affected by marine plastic.
 - Students will consider that sea turtles and seabirds often mistake plastic for food, and that sea lions, seals, and humpback whales are regularly entrapped or entangled by plastics. Have students fill out the Plastics and Marine Animals Investigation Worksheet (see Workbook page 8). Please note: students will need time to conduct research online.
 - Students will create a poster style sheet, by drawing an animal of their choice, labeled (name of animal, type of animal), what they would eat, and what would hunt their animal, consider plastic impacts to their animal.
 - *Optional:* have students create a collage with the cut-out images.
4. Have students present their animal investigation with the class. Encourage them to have fun with their presentation (*Use props! Act it out! Create a skit!*)
 - For the presentations, make sure students share the appropriate information of their animals, what they eat, how they would protect themselves from what would be eating them, and lastly, discuss as a group the impacts of plastic on their animal and its habitat.

Resources

- WATCH** ▶ Ocean Wise's video: [Saving Sea Lions](#)
- WATCH** ▶ Ocean Wise's video: [Microplastics: Too small to see TOO BIG TO IGNORE](#)
- WATCH** ▶ Ocean Wise's video: [What happens to microplastics in the ocean? | Ocean Wise](#)
- WATCH** ▶ [How Plastics Hurt The World](#)
- WATCH** ▶ National Geographic's video: [Kids Take Action Against Ocean Plastic](#)

THOUGHT BOOK

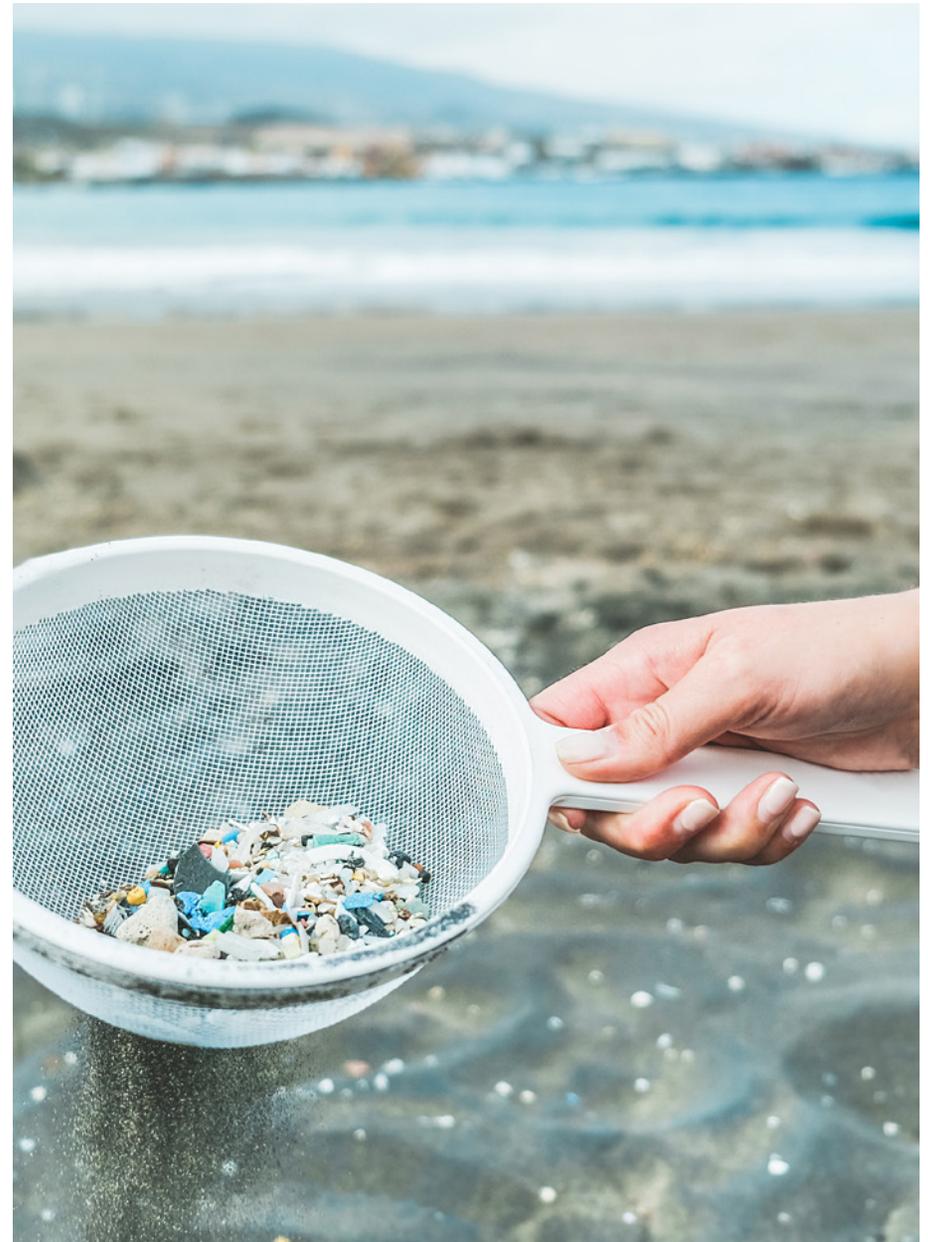
Reflect

- What are all the different ways that plastic impacts animals and ecosystems in our oceans?
- How does plastic and/or microplastic pollution impact ecosystems?
- What are steps you can take to help reduce plastic pollution/litter in your school?

TAKE ACTION

→ Every action counts! Use the **4R's** – **R**efuse, **R**euse, **R**educe, and **R**ecycle.

THE WHY By using the 4R's, you take a positive step to reduce plastic pollution by removing the problem at the start. Every single use piece of plastic you refuse, reuse, reduce or recycle means one less pollutant harming marine life and our own health!



LESSON THREE: TRAVELING PLASTICS AND POLLUTION SOLUTIONS

BACKGROUND

Reducing plastic pollution not only supports ocean health but promotes the ocean's ability to regulate the world's climate. This lesson will deepen students' understanding of the role the ocean plays in climate change, how plastic impacts the ocean's ability to regulate climate, and how plastic can spread to the most remote parts of the world.

As part of the water cycle, water moves down rivers, through mountain ranges and prairies, and across great distances to reach the ocean. Consider what happens when your plastic litter is dropped and carried by the wind into a river. This single piece of plastic can be carried to the beach, out to sea, and eventually into the ocean where currents move plastics across the globe and down to the ocean's deepest depths.

As plastic has now reached the most remote places on earth, the challenge to remove this harmful substance from marine ecosystems is much more challenging. Experts suggest that societies should focus on reducing plastic waste, while simultaneously extracting it from the water using innovative technologies. Many projects and initiatives are working hard to tackle the plastic crisis. Being aware, sharing information, and reducing plastic waste makes you part of a growing community working towards cleaner oceans and healthier ecosystems.

OBJECTIVES

Students will be able to:

- Deepen their understanding of how plastics move throughout the oceans and travel across the world.
- Understand the work already being done to solve the plastic pollution crisis and creatively brainstorm their own.



CRITICAL QUESTIONS

- How does plastic move around the world?
- What projects are helping solve plastic pollution?
- How can you make a difference in the plastic solution?

MATERIALS

- Student Workbook
- Pen/Pencil
- Audio visual system

ACTIVITIES

Engage

1. Review the water cycle as a class and fill out to worksheet (Workbook page 10).
2. Watch Ocean Wise's video: [Hokulea Sailed Around the World, But Couldn't Escape Plastic | Ocean Stories](#). Have students read (or read together as a class) [Plastic Bag Found at the Bottom of World's Deepest Ocean Trench](#).
3. As a class, scroll through [The Deep Sea](#) to get a sense of where deep plastic has been spotted. Discuss what forces have led to plastic being found inside the Mariana Trench, at a depth of 10,975 meters (36,000 feet)!
4. As a group, discuss where the closest body of water is.
5. Invite students to draw a comic strip depicting the journey of a piece of plastic moving from school to the closest river, lake, etc. (and maybe all the way to the ocean) (Workbook page 11).
6. Watch: The Ocean Cleanup's video [Dear Earth](#). As a class, discuss what you foresee as the future outcome for plastic pollution in the ocean, considering the best and worst scenarios. Write down notes and/or draw on the board what these best-case scenarios for the future could be. Then, work together to determine the steps needed to reach that goal.

Resources

- WATCH** ► Ocean Wise's video: [Hokulea Sailed Around the World, But Couldn't Escape Plastic | Ocean Stories](#)
- READ** ► National Geographic article: [Plastic Bag Found at the Bottom of World's Deepest Ocean Trench](#)
- SCROLL** ► Scroll through: [The Deep Sea](#)
- WATCH** ► The Ocean Cleanup's video [Dear Earth](#)

THOUGHT BOOK

Reflect

- How does plastic end up in the ocean?
- What can you and your family do to reduce plastic waste?
- What could your school do to reduce plastic waste?

TAKE ACTION

→ Create a poster to inspire change in your school!

THE WHY Help make a difference! Share with your friends and family what you learned! Remind them to buy less plastic, to pick up litter, and recycle plastic. This will help save marine animals like turtles, seabirds, and fish.



APPENDIX – RESOURCES

LESSON ONE

- **A Whale's Tale** – CBC Kids: https://www.youtube.com/watch?v=xFPoIU5iiYQ&ab_channel=CBCKids
- **Reduce, Reuse, Recycle** – Explore Documentary Films: https://www.youtube.com/watch?v=uSM2riAEX4U&t=3s&ab_channel=ExploreDocumentaryFilms
- **Take the Pledge** – Ocean Wise: <https://plasticreduction.ocean.org/individuals/>
- **Weaving Traditional Educational Knowledge into Biological Education: A Call to Action by Robin Wall Kimmerer** – BioScience: <https://academic.oup.com/bioscience/article/52/5/432/236145>

LESSON TWO

- **Saving Sea Lions** – Ocean Wise: https://www.youtube.com/watch?v=KGh-gMEGGPI&t=5s&ab_channel=OceanWise
- **Microplastics: Too small to see TOO BIG TO IGNORE** – Ocean Wise: https://www.youtube.com/watch?v=_6h11PipBrg&ab_channel=OceanWise
- **What Happens to Microplastics in the Ocean?** – Ocean Wise: https://www.youtube.com/watch?v=Y0Ks8oSUgls&t=20s&ab_channel=SciShow
- **How Plastics Hurt the World** – SciShow Kids: <https://www.youtube.com/watch?v=VUUUxOI715s>
- **Kids Take Action Against Ocean Plastic** – National Geographic: https://www.youtube.com/watch?v=hKfV9IquMXA&ab_channel=NationalGeographic

LESSON THREE

- **Hokulea Sailed Around the World, But Couldn't Escape Plastic** – Ocean Wise: https://www.youtube.com/watch?v=ygAmcULO3Ro&ab_channel=OceanWise
- **Plastic Bag Found at the Bottom of World's Deepest Ocean Trench** – National Geographic: <https://www.nationalgeographic.org/article/plastic-bag-found-bottom-worlds-deepest-ocean-trench/3rd-grade/>
- **The Deep Sea** – Neal.fun: <https://neal.fun/deep-sea/>
- **Dear Earth** – The Ocean Cleanup: https://www.youtube.com/watch?v=8HQEd_IX6A8&ab_channel=TheOceanCleanup