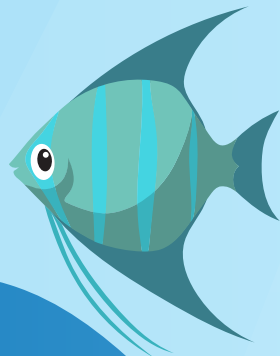


# Making a **SPLASH**



Activity  
**Book**



# Acknowledgements



Making a Splash offers youth across Canada the opportunity to learn about about the Life Below Water United Nations Sustainable Development Goal, and their personal role in supporting healthy water ecosystems. This unique learn-at-home program would not be possible without the dedicated support of our partners.

## PRESENTING PARTNER



## SUPPORTING PARTNERS



## YOUTH ADVISORY PANEL

We would also like to thank the advisory panel that assisted in the editing and content review of this resource. We appreciate their support of 4-H Canada's outreach initiatives and 'Learn To Do By Doing' programming.

Brett Rumpel, 4-H Canada Youth Advisory Committee

Written by Melina Found  
Designed by Em Dash Design, Montreal

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Government  
of Canada



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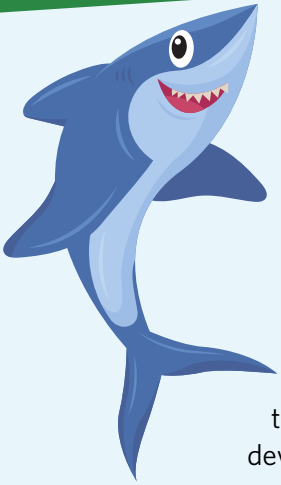
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You'll notice there are links to videos and other information throughout this activity guide. Please download the digital version of Making a Splash for easy access to these links!

Download and learn more at [4-h-canada.ca/making-a-splash](https://4-h-canada.ca/making-a-splash)

# Introduction



## Hello!

We're thrilled that you are joining us for Making a Splash - an initiative for youth across Canada, 4-H members, families, and clubs! This is an opportunity for you to learn about an interesting topic, participate in hands-on activities (including cleaning up waterways in your own community!) and have some 4-H fun in your own home.

This initiative is part of 4-H Canada's Environment & Healthy Living Leadership Development Pillar, which supports youth in being stewards of the environment - protecting the health of the planet and themselves. Youth are able to learn about healthy choices, develop sustainable solutions, and explore positive ways to make environmental impacts.

In this Activity Book and the accompanying Activity Kit, you will find everything you need to know about water ecosystems, along with hands-on activities! Our hope is that you will achieve the following learning goals:

- Understand how we are connected to and responsible for life below water, and why it is important.
- Learn about the Sustainable Development Goals, and their impact on the world.
- Identify actions you can take to support water ecosystems in your home, community, country, and around the world.
- Develop skills that help you protect the environment and can be applied to global issues.
- Become a water ecosystem champion by creating awareness about this issue.

This Activity Kit contains:

- Making a Splash Activity Book
- Supplies to explore water activities, including:
  - » Gloves
  - » Garbage bags
  - » Seashells
- Life Below Water SDG info sheet
- 4-H water bottle
- 4-H pen

Continuing with the success of last year's SDG outreach initiatives, we wanted to expand the opportunity for youth to get involved in 4-H programming by making this kit available across Canada to 4-H members, families, and even youth who aren't members yet! For those of you who may not be familiar with 4-H, we believe in nurturing responsible, caring and contributing leaders who are committed to positively impacting their communities. We provide hands-on learning for youth across the country thanks to the support of volunteer leaders. To learn more about us, check out our programs at [4-h-canada.ca](http://4-h-canada.ca).

We can't wait to see what you learn and dive into! Take a minute to share it with us by tagging [@4hcanada](https://www.instagram.com/4hcanada) on Instagram, Facebook, or Twitter.

*The 4-H Canada Team*

# What are the Sustainable Development Goals?

## Explore The 17 SDGs

You can learn more about what the 17 goals are at

[sdgs.un.org](https://sdgs.un.org)

The Sustainable Development Goals (SDGs) are a set of 17 global goals developed by the United Nations. The United Nations is an international organization that encourages nations to protect peace and security, and work well together. The SDGs are a global call to action, with the support of 193 nations, including Canada. Each nation is working to achieve these 17 goals which deal with poverty, health, education, and the environment.

When setting a goal, it is always valuable to look to the future. The United Nations did just this by asking, "What will it look like when these goals are achieved? How long will it take?" So, in 2015, the United Nations developed these goals and laid out what they wanted the world to look like in 2030.



### Diving Deeper

What is a long-term goal you've achieved for yourself? Maybe, it was to develop a new habit or achieve something that is important to you. How did you work toward that goal? Did you take little steps, or was it a big effort all at once? How did you know when you achieved it?

.....

.....

.....

.....

Consider the SMART template for setting your own goals!

Specific

**S**  
**G**

What do you want to do?

Measurable

**M**  
**O**

How will you know when you've reached it?

Achievable

**A**  
**A**

Is it in your power to accomplish it?

Realistic

**R**  
**L**

Can you realistically achieve it?

Timely

**T**  
**S**

When exactly do you want to accomplish it?



# Making a SPLASH

## SUSTAINABLE DEVELOPMENT GOALS



For Making a Splash, we are focusing on SDG 14, Life Below Water. This SDG has the goal to make sure our water ecosystem is protected from pollution and the effects of pollution, rebuild water ecosystems, and fish sustainably.



### CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

As we learn more about our oceans and waterways, we start to realize how deep we can go! **The ocean covers 75% of the Earth's surface**, so there is a lot to explore. This huge space is home to hundreds of thousands of different species of animals and plants – from tiny things like plankton to huge animals like whales. What's incredible is that more than 3 billion people depend on this marine and coastal biodiversity for their jobs and food!<sup>1</sup> Beneath the waves there are lots of different ecosystems – warm tropical reefs, deep trenches, kelp forests, even freshwater lakes, rivers, and streams. These environments are important, fascinating, and fragile and we need to make sure they're protected.

### THE POWER OF OUR PLEDGE

Who can be a **global citizen**? Anyone, including you! A global citizen is someone who is aware of global issues and wants to make the world a better place for everyone. And just like the 4-H Pledge, it is someone who commits their Head, Heart, Hands, and Health to their community, country, and the world.

There has been some success in protecting coastlines and marine ecosystems, with countries setting up more protected conservation areas and more closely monitoring fishing. But we still have a lot more to do:

- 40% of the ocean is heavily affected by pollution, shrinking numbers of fish, loss of coastal habitats, and other human activities.<sup>2</sup>
- Roughly 1/3 of aquatic mammals, sharks, and coral species are considered endangered.<sup>3</sup>
- In some habitats, there are 7x the number of bits of plastic than fish.<sup>4</sup>

Canada has the longest coastline and more lakes than any other country,<sup>5</sup> which means we have a lot of water to protect. From ocean water to fresh water, we need to keep working to reduce pollution and plastics, manage our fisheries, and be aware of species at risk. As a global citizen, it is important to be aware of Canadian issues, but also aware that these issues are global. We're all connected by the oceans, lakes, and rivers, so when each country does their part - working together to achieve this goal - everyone wins!



This goal is also closely linked to climate change because of the increase in greenhouse gases. The ocean absorbs about 30% of the carbon dioxide (CO<sub>2</sub>) that is released into the air, and as CO<sub>2</sub> levels have increased, so do the levels in the ocean.<sup>6</sup> When CO<sub>2</sub> is absorbed by seawater, a series of chemical reactions occur, causing the seawater to become more acidic, which can hurt ocean life (more information about this on the following pages). It's important to remember that climate change is connected to all parts of our world, and by working to fix one issue we can actually be fixing many more!

## DIVING DEEPER

The protection of life below water is something that is important to us all. Check out these interactive global maps and charts that show the progress being made on SDG 14. What do you notice when you look around the world? Which countries have made progress on the different parts of SDG 14 and which ones have not? [sdg-tracker.org/oceans](https://sdg-tracker.org/oceans)

## MAKING WAVES

Want to learn even more? Check out this site with more information and a series of articles and updates about SDG 14:

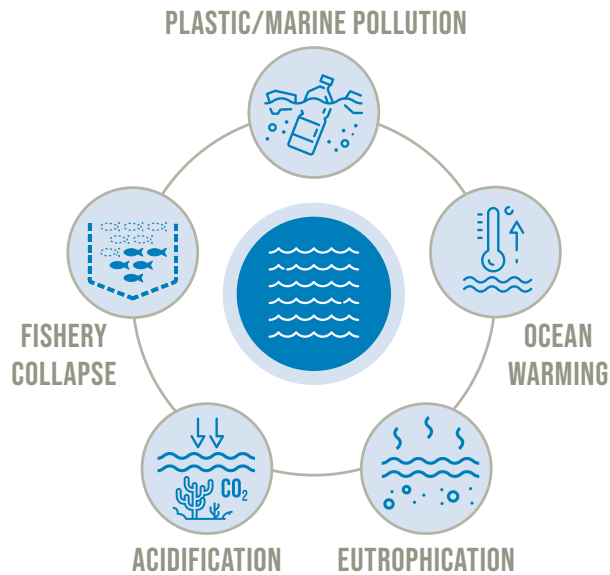
[fao.org/sustainable-development-goals/goals/goal-14/en](https://fao.org/sustainable-development-goals/goals/goal-14/en)





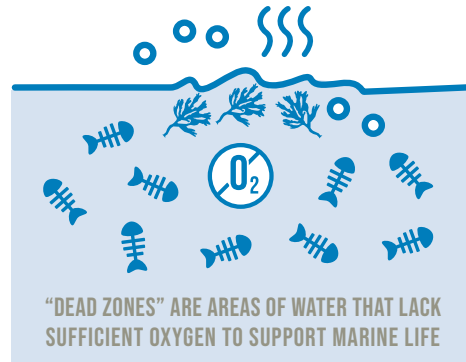
## CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

### THE SUSTAINABILITY OF OUR OCEANS IS UNDER SEVERE THREAT

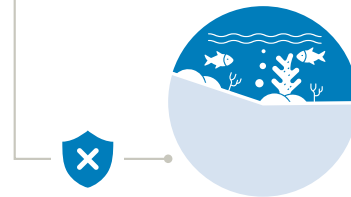


OVER 3 BILLION PEOPLE RELY ON OCEANS FOR THEIR LIVELIHOODS

DEAD ZONES ARE RISING AT AN ALARMING RATE, FROM 400 IN 2008 TO 700 IN 2019



OVER HALF OF MARINE KEY BIODIVERSITY AREAS ARE NOT PROTECTED



ABOUT HALF OF COUNTRIES WORLDWIDE HAVE ADOPTED SPECIFIC INITIATIVES TO SUPPORT SMALL-SCALE FISHERS



ON AVERAGE, ONLY 1.2% OF NATIONAL RESEARCH BUDGETS ARE ALLOCATED FOR OCEAN SCIENCE





# Splish-Splash – Our Water Ecosystems



Water is all around us, and SDG 14 - Life Below Water is dedicated to protecting every drop. Let's explore some of the different types of water, some of which might be in your own community. Whether you live by the ocean, a lake, or a river, learn more about these fascinating ecosystems!

First, let's start with some of the basic words and terms we'll be using:

**ACIDIFICATION** - a chemical reaction that causes the ocean to become more acidic when it absorbs carbon dioxide (CO<sub>2</sub>) from the air. The water becoming more acidic harms the animals and plants living in it.

**BIODIVERSITY** - the variety of plants and animals in the world or in a particular habitat or ecosystem.

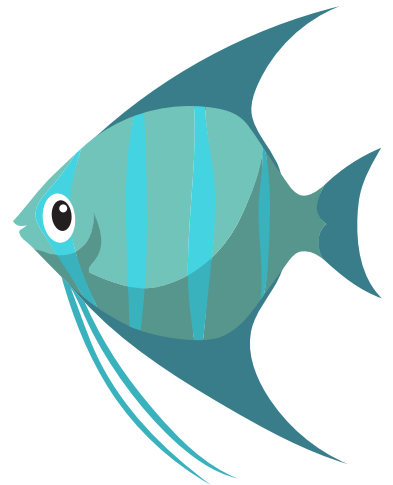
**ECOSYSTEM** - a community of animals and plants and how they live in their environment.

**HABITAT** - the natural home or environment of an animal or plant.

## Oceans

Covering the largest part of the globe and containing 97% of the Earth's water,<sup>7</sup> our oceans are filled with salt water and home to an incredible variety of life.<sup>8</sup> There are five oceans, including a new one just identified in 2021 on World Oceans Day<sup>9</sup>

- Arctic Ocean
- Atlantic Ocean
- Indian Ocean
- Pacific Ocean
- Southern Ocean - new - around Antarctica



Even with five different oceans, we can also think of the world having just one ocean, as all of the oceans are connected. We have only explored 5% of the ocean,<sup>10</sup> but improved technology is allowing us to better study and learn more about this huge part of our planet. Close your eyes and imagine the beautiful coral reefs, the incredible sharks, the millions of fish, the giant whales, the gliding turtles, the floating jellyfish, the swaying seaweed... it's almost like a whole new world!

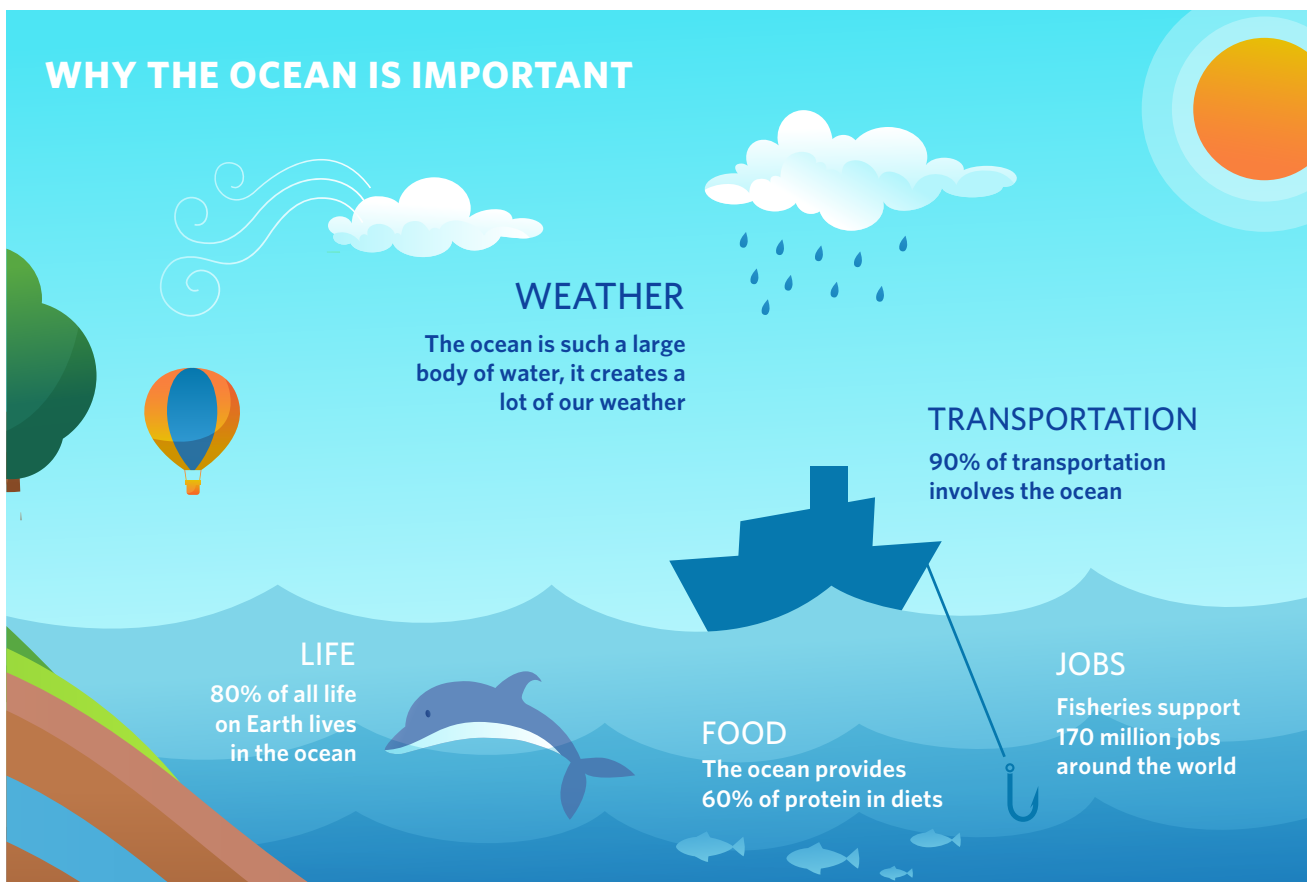
# Making a SPLASH

## Cool facts:

- The deepest point of the ocean is the Mariana Trench, reaching a depth of 11 km.<sup>11</sup>
- The middle point of the ocean is Point Nemo, 2688 km from the closest point of land.<sup>12</sup>
- The biggest waves can reach 19 m tall.<sup>13</sup>
- The longest mountain range in the world is found under water. Stretching over 56,000 km, the Mid-Oceanic Ridge is a mountain chain that runs along the centre of the ocean.<sup>14</sup>

## Why the ocean is important:

- The ocean is such a large body of water, it creates a lot of our weather – warm air hitting cold water, or cold air hitting warmer water causes rain, wind, storms, and helps manage the temperatures of the air and ocean.<sup>15</sup>
- 90% of transportation involves the ocean – we transport millions of tons of food, products, and raw materials.<sup>16</sup>
- The ocean is full of life, and supports the lives of humans as well, providing 60% of protein in diets in tropical developing countries.<sup>17</sup>
- Fisheries support 170 million jobs around the world.<sup>18</sup>
- 80% of all life on Earth lives in the ocean.<sup>19</sup>



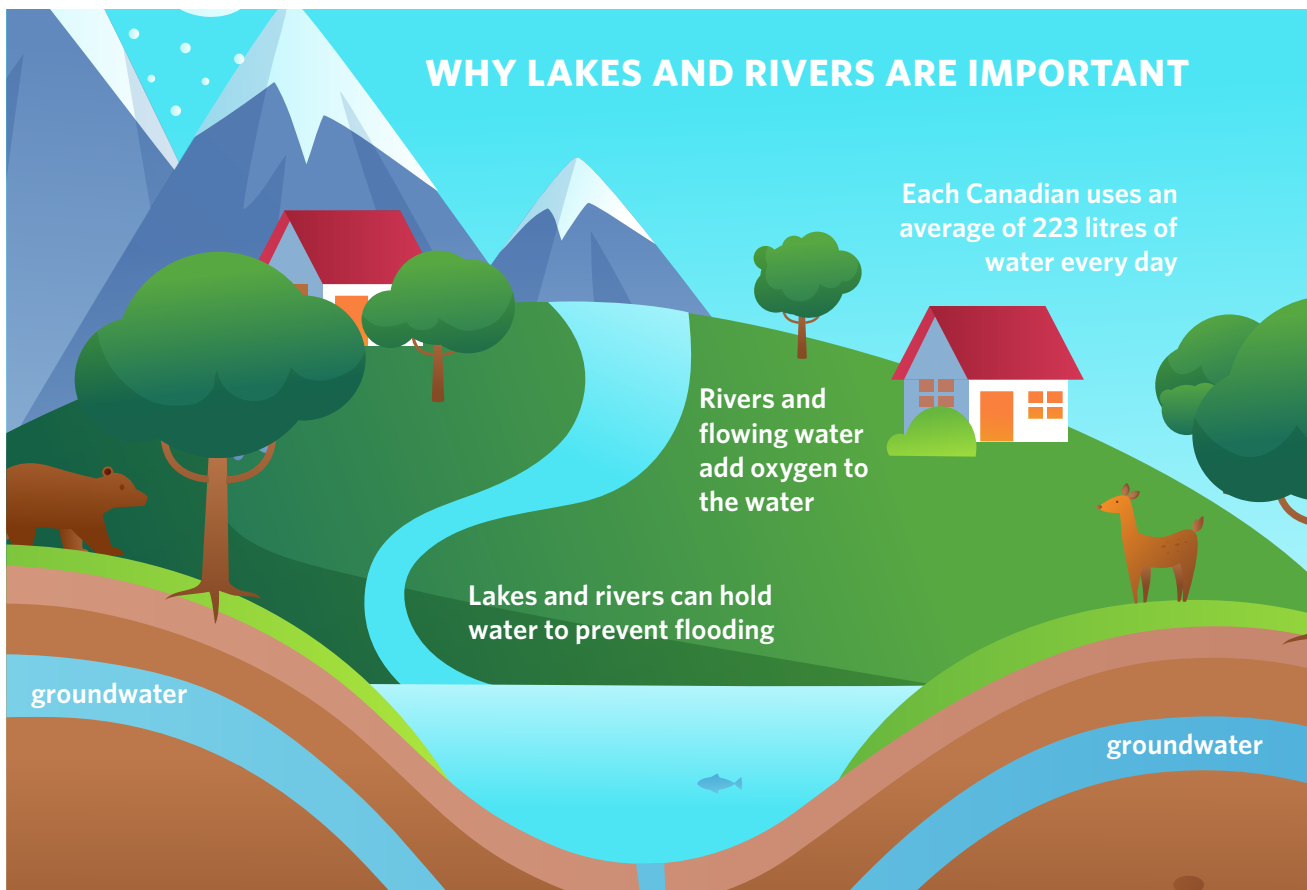
## Lakes and rivers

Canada has more lakes than any other country, and we have 20% of the world's fresh water,<sup>20</sup> which is important because this is the water we can drink. Lakes and rivers contain fresh water, unlike the salty water found in oceans. We can drink fresh water – when clean – but not ocean water because of all the salt in it. Canadians have a deep historical connection to fresh water; we count on it for transportation, resources, employment, food and recreation — swimming, boating, fishing or just enjoying the scenery of a natural lake or wild river.<sup>21</sup>

Unfortunately, many of Canada's freshwaters are not as clean as they once were. Protecting our lakes and rivers is important for our drinking water, the plants and animals that live in them, and the planet as a whole.

### Cool facts:

- Shared with the US, the Great Lakes hold 20% of the Earth's surface fresh water.
- The Mackenzie River is the longest river in Canada at 4,241 km long and flows into more than 50,000 lakes.<sup>22</sup>
- Canada has 200 species of freshwater fish; one third are considered at-risk.<sup>23</sup>
- Henderson Lake, in British Columbia, receives the most annual precipitation in Canada, with 6,655 mm of precipitation each year.<sup>24</sup>



# Making a SPLASH

## Why lakes and rivers are important:

- Lakes and rivers can hold water to prevent flooding – their levels rise and fall, and they can hold rainwater as water flows to them over land.<sup>25</sup>
- Lakes help to slowly rebuild groundwater – which is where we get a lot of our drinking water from.<sup>26</sup> Groundwater is the layer of water below the ground that takes a long time to collect, slowly soaking down and filtered through soil.
- Rivers and flowing water add oxygen to the water – the swirling waves mix air into the water, keeping oxygen levels high for fish and other species that need it to breathe underwater.<sup>27</sup>
- Each Canadian uses an average of 223 litres of water every day.<sup>28</sup>

We need to keep our waterways clean while also decreasing our use so that we don't damage or overuse our natural resources. That way, we'll have clean, fresh water to drink, and the lakes and rivers will be a healthy environment for fish, plants, and other wildlife.



### GLOBAL SNAPSHOTS Tanzania

Plastics in our ocean is a serious issue, and Tanzania was concerned by the damage happening along their waterways and coast. There is a cost to environmental harm because it can affect fisheries and tourism, along with the added expense of environmental repair. They, along with other African nations, started The Africa Integrated Maritime Strategy, a plan to protect Africa's water or 'blue' economy.<sup>29</sup>

**Look it up!** Do some research and learn about the water ecosystems in this country.

**What are some animals found in this ecosystem?**

.....

.....

.....

**Why is it important to protect this ecosystem?**

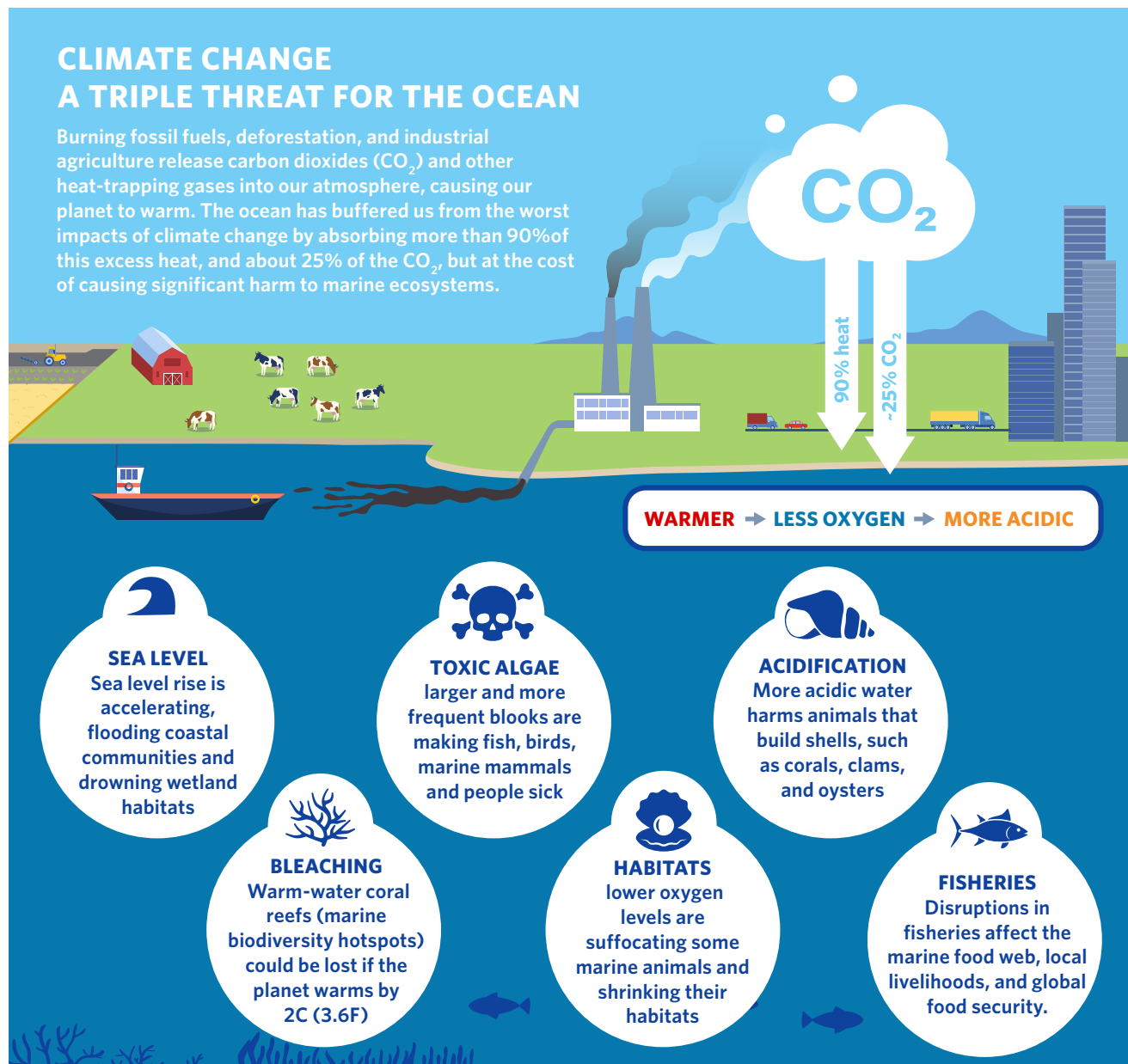
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# Our Water at Risk

## Acidification

As we mentioned before, the ocean absorbs about 30% of the carbon dioxide (CO<sub>2</sub>) that is released into the air. As CO<sub>2</sub> levels in the air have increased, so have the levels in the ocean.<sup>30</sup> When CO<sub>2</sub> is absorbed by seawater, a series of chemical reactions happen, which causes the seawater to become more acidic. Just like we're used to breathing air that is made up of 78% nitrogen, 21% oxygen, and a mix of other gases, animals and plants evolved to live in oceans with a specific acidic level. With oceans becoming more acidic,





# Making a SPLASH

the plants and animals living in it are impacted – just like you couldn't breathe air that is a different make-up of gas, fish, animals, and plants can't live in more acidic water. Since 1985, the ocean has continued to absorb more CO<sub>2</sub> and become more acidic.<sup>31</sup> Acidification hurts coral and shellfish, as their structure and shells are made of calcium carbonate, which is weakened by acid. It also hurts zooplankton – super small animals that fish and other animals rely on for food. This impacts the entire ocean, but also impacts the people and communities who rely on the ocean for food and their jobs.<sup>32</sup>

We can reduce the impact of acidification by reducing the amount of CO<sub>2</sub> in the air. The health of life below water is directly linked to climate change. Working to achieve the goal of SDG 13 – Climate Action, will also help our water ecosystems!

## Biodiversity

Remember, biodiversity is the variety of plants and animals in the world or in a particular habitat or ecosystem.

The ocean contains nearly 200,000 identified species, but actual numbers may be in the millions.<sup>33</sup> All of these species are important and connected to each other, but these species are also being negatively impacted by pollution, climate change, microplastics, and overfishing. This can cause populations to decline, animals and plants to be hurt, and could lead to species becoming endangered or even becoming extinct. This also means the biodiversity in the ocean can decrease, meaning there will be less diversity, or fewer different types of species. More than 40% of amphibian species, almost 33% of reef-forming corals, and more than a third of all marine mammals are threatened.<sup>34</sup>

Check out this website to discover the aquatic species at risk in your area:  
[dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html](https://dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html)



GLOBAL  
SNAPSHOTS  
Croatia

This European country has 6,278 km of coastline, including 1,244 islands, reefs, and cliffs. With so much water, Croatia is working to protect their water biodiversity. Fishing is an important industry in the country, but it must be managed sustainably. Since 2019, Croatia has been using drones to watch fishing, monitor populations, and even monitor for illegal fishing!<sup>35</sup>

**Look it up!** Do some research and learn about the water ecosystems in this country.

**What are some animals found in this ecosystem?**

.....

.....

.....

**Why is it important to protect this ecosystem?**

.....

.....

Unfortunately, aquatic species are also at risk from other species that are introduced to the area. These are called invasive species – species that are new to an area and cause harm. New animals and plants can arrive by hitching a ride on international ships, or can be introduced from fish farms, landscaping/gardening, even from escaped or released pets! You can see if there are any invasive species in your province or community here: [invasivespeciescentre.ca/invasive-species/meet-the-species/fish-and-invertebrates](https://invasivespeciescentre.ca/invasive-species/meet-the-species/fish-and-invertebrates).

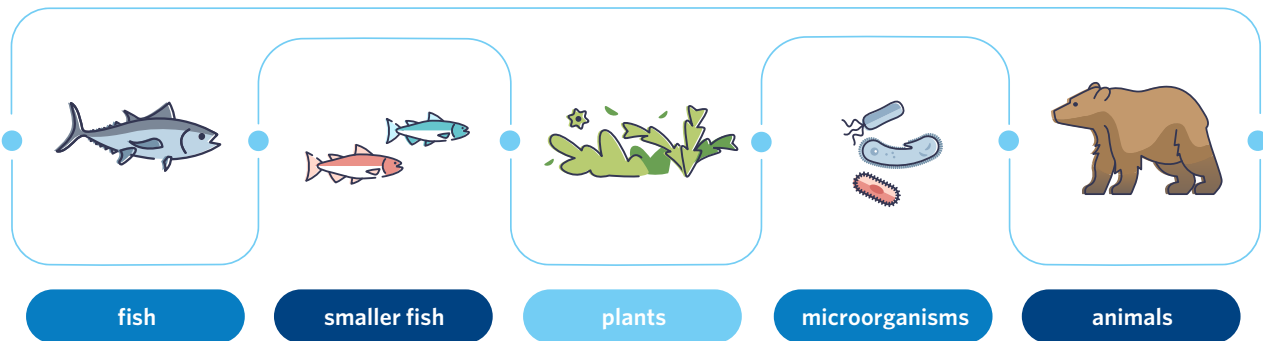
What did you find? Create your own poster about an invasive species in your area. Describe the species, draw a picture, and explain what your community can do to stop the spread.

We can protect the biodiversity of life below water by creating protected areas, monitoring fishing, reducing pollution, removing invasive species, and keeping plastic out of our waterways.

## Overfishing

Overfishing is when fish are removed from waterways faster than the population of fish can grow to replace itself. Eventually, there are fewer and fewer fish, harming the environment and the plants, animals, and other organisms connected to those fish.

Imagine everything in an ecosystem being connected with an invisible thread. Each fish is connected to the plants, smaller fish, or microorganisms that it eats. Each fish is connected to the plants and other microorganisms that get nutrients from its waste or from its body when it dies. And each fish is connected to the different animals that eat it. You can start to imagine thousands of invisible threads connected to just one fish... now think of a whole school of fish, or the millions of fish that are caught each year. This is why it is important to fish sustainably and make sure that fish populations have a chance to rebuild those connections – all living things rely on each other.



### OTHER ISSUES CONNECTED TO OVERFISHING INCLUDE:<sup>36</sup>

- Catching fish that are too young, or catching too many, so the population can't rebuild.
- Coral reefs or fragile coastal ecosystems can be damaged by fishing gear that is left behind or gets away.
- A billion people worldwide rely on fish as a significant source of food – overfishing can cause food insecurity for many people.

# Making a SPLASH

## Microplastics

Microplastics are tiny pieces of any type of plastic that are less than 5 mm in length.<sup>37</sup> They come from larger pieces of plastic or things containing plastic breaking down on land or in the water. Unfortunately, they get into our waterways through a variety of sources:

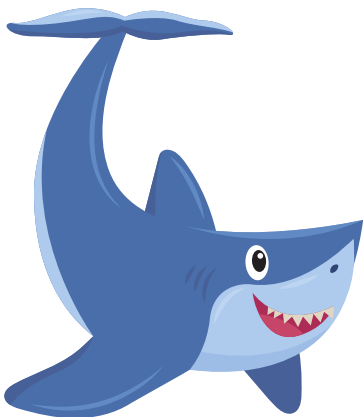
- **Plastic garbage** being washed into the water and then breaking down into smaller pieces - like plastic bags, wrappers, straws, and other litter.
- Washing clothes made with **synthetic materials**.
- **Paints** and other plastic coatings.
- **Microbeads** in things like soaps, toothpastes, and other cosmetics.
- **Fishing nets** and equipment.
- **Plastic pellets** that get washed overboard in transport - the pellets are used to make plastic products.



*All of these pieces of plastic were found in the stomach of this baby turtle.*

Scientists have found microplastics everywhere they have looked: deep oceans, Arctic snow and Antarctic ice, shellfish, table salt, drinking water, and rain falling over mountains and cities. This is a serious issue because unfortunately, these tiny pieces could take decades or more to fully break down. In the meantime, they collect in the environment - sometimes looking like food to animals; getting caught in plants, coral, or in fish gills; breaking down to become toxic chemicals in the ecosystem.

By learning more about why it is important for us to protect our water ecosystems, we can take action and reduce our impact. There is a big cost to the environment, water, animals and plants, the global climate, and to people's lives if we don't. Let's make waves and work together to achieve SDG 14 to protect our planet.



We can use technology to better understand the issue of microplastics and how we can clean it up. Try this awesome coding activity - you don't need know how to code! Follow the simple instructions to program a diver to pick up garbage in the ocean. Learn to do by doing, and try something new!

👉 [kidscodejeunesse.org/data/resources/resources\\_files/en/scratch/scratch\\_science\\_odyssey\\_2019.pdf](https://kidscodejeunesse.org/data/resources/resources_files/en/scratch/scratch_science_odyssey_2019.pdf)

# Make Waves – How You Can Make Change

With water covering so much of the planet, it might feel like it would be impossible to make a difference... like a drop in the ocean. But there are clear goals we can all work toward, and ways you can make a change in your own life, that will trickle into bigger change as the world takes steps to protect life below water.

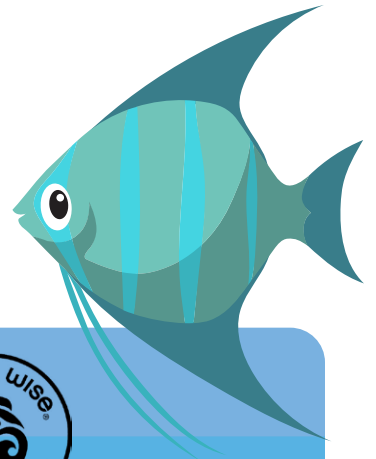
What will it look like when we achieve this goal as a planet?

- Water pollution will be reduced and prevented.
- Our water ecosystems will be protected.
- We will end overfishing and illegal fishing.
- People and communities that rely on fishing will be able to do so sustainably.
- Scientists, researchers, and experts will work together to better understand ocean life, find new ways to reduce ocean acidification, and innovate new technologies to help protect water ecosystems.
- We will create and maintain international policies and laws to protect life below water.

## Your Ripple Affect

Protecting life below water is a something we can all support in our own lives. By making changes on a personal level, you can help the world achieve this goal. Check out these things that we can all do to reduce our impact on our water ecosystems:

- Turn the tap off when brushing your teeth.
- Try to take showers instead of baths - shorter showers help to save even more water.
- Keep a glass or water bottle in the fridge so you don't have to run the tap for a long time to get cold water - you'll already have chilled water waiting for you in the fridge!
- Have some water left over in a glass or water bottle? Pour it on some indoor plants or outside, instead of down the drain.
- Use a reusable water bottle to save money and allow you to refill almost anywhere.
- Think about packing spare cutlery and a metal or paper straw in your backpack, or in your family's vehicle, so you have reusable cutlery on the go!
- Remember to bring a travel mug when you're going out. Some shops even offer discounts when you bring your own mug!



## GO FISHING...AT THE GROCERY STORE

The next time you go grocery shopping with your family, see if you can find products that are marked with a sustainable fishing or oceans symbol. Look up the sustainability of different fish and seafood here:

[seafood.ocean.org/seafood/browse/](https://seafood.ocean.org/seafood/browse/)



# Making a SPLASH

## 10 WAYS TO HELP OUR OCEAN

at home      around town      on the water

- 1** **Conserve Water**  
Use less water so excess runoff and wastewater will not flow into the ocean.
- 2** **Reduce pollutants**  
Choose nontoxic chemicals and dispose of all chemicals properly.
- 3** **Reduce waste**  
Cut down on what you throw away.
- 4** **Shop wisely**  
Choose sustainable seafood. Buy less plastic and bring a reusable bag.
- 5** **Reduce vehicle pollution**  
Use fuel efficient vehicles, carpool or ride a bike.
- 6** **Use less energy**  
Choose energy efficient light bulbs and don't overset your thermostat.
- 7** **Fish responsibly**  
Follow "catch and release" practices and keep more fish alive.
- 8** **Practice safe boating**  
Anchor in sandy areas far from coral and sea grasses. Adhere to "no wake" zones.
- 9** **Respect habitat**  
Healthy habitat and survival go hand in hand. Treat with care.

anywhere, anytime  **10** **Volunteer**  
Volunteer for cleanups at the beach and in your community. You can get involved in protecting your watershed too!

oceanservice.noaa.gov 

- Talk to your family about changes you can make together:
  - » See if you can use most of your water in off-peak times (usually after 5 or 7 p.m.).
  - » Do any of the taps in your home leak? Find a few videos online and see if you can learn a new skill and fix them together.
  - » If you need to buy new clothes, try to buy natural fibres, and wash them in cold water. You can even try buying gently used second-hand clothes to give them a new life!
  - » Check out the labels on your soaps, shampoos, and detergents to see if any of them mention being biodegradable. If not, see if you can find alternatives the next time you need to buy more.
  - » Pledge to wash your clothes in cold water to reduce microfibres being released.
  - » We can all forget our reusable bags when headed to the store – gather them up and make sure they're available every time you head to the grocery store or go shopping.

### DIVING DEEPER

This amazing online program is your ticket to an underwater world. Developed by the Ocean Frontier Institute and the National Film Board of Canada, this interactive program walks you through a variety of activities and up-close videos. Check out this unique program - Ocean School!

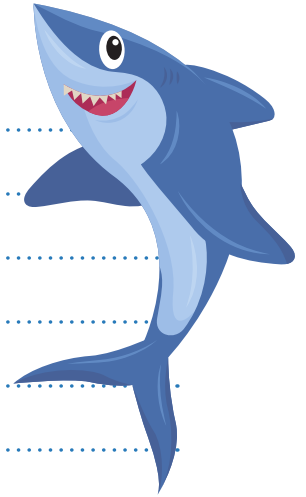
 [oceanschool-xp.nfb.ca/](https://oceanschool-xp.nfb.ca/)



# Making a SPLASH

- » Are there places you can bike or walk to together as a family? Challenge yourselves to turn one family activity or run one errand using a mode of transport other than a vehicle.
- » Does your family recycle? If not, see if there is a way for you to set it up. Most communities offer recycling of metal, glass, and plastic, and they'll often even provide a bin to help you sort and collect it. Every bit that gets recycled is one less bit that could end up in our waterways.

**Write your own ideas here:**



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## GLOBAL SNAPSHOTS Venezuela

The Amazon jungle is impressive, but so are the forests of mangroves found along the coast! These rare but incredible plants create unique ecosystems. The branches support lots of different animal species, while down below there is sheltered space for fish and other wildlife in their roots that stick right into the water. Strong roots also protect the shoreline from waves. The Coastal Venezuelan Mangroves is almost  $\frac{1}{4}$  of the Venezuelan coastline!<sup>38</sup>

**Look it up!** Do some research and learn about the water ecosystems in this country.

**What are some animals found in this ecosystem?**

.....

.....

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**Why is it important to protect this ecosystem?**

.....

.....



## **The Power of Seeing It Up Close**

Nothing is more powerful than seeing these water ecosystems in person. Beneath the waves is a whole other world to explore, understand, and protect. The next time you are going swimming with your family (you should always have an adult with you when you're in or around water), try bringing a mask and snorkel so you can check it out. Whether you're swimming at a lake, river, or the ocean, you'll be able to see things from a different perspective. Watching minnows dart around, water plants moving with the current, and rocks and shells along the bottom all give us a better understanding of life below water.

If you are curious and want to take it further, check out the awesome sport of scuba diving! You can start learning to scuba dive at the age of eight. It requires taking courses and using special gear, but it is an amazing experience to be able to breathe underwater, and see water ecosystems, and things like shipwrecks and coral reefs up close!

Check out this article for more information: [🌐 \*\*blog.padi.com/scuba-diving-lessons-for-kids/\*\*](https://blog.padi.com/scuba-diving-lessons-for-kids/).

To build on what you are learning and exploring with this activity book, check out these past 4-H resources from different provinces across Canada, available for volunteer leaders to download at [🌐 \*\*4-h-learns.org\*\*](https://4-h-learns.org)

- Fisheries – 4-H Nova Scotia
- Take a Kid Ice Fishing! – 4-H Ontario
- Tracking Precipitation and Weather – 4-H Manitoba

And many more!

# Activities

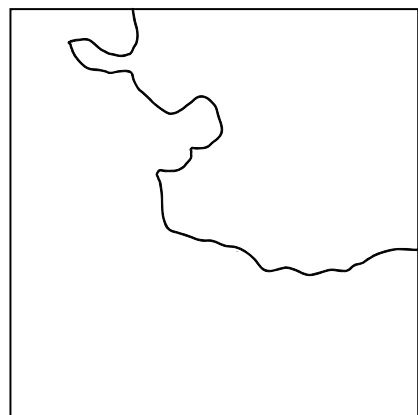
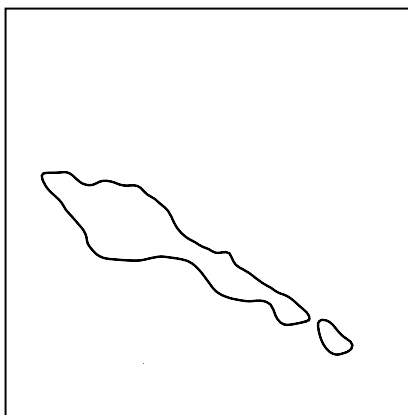
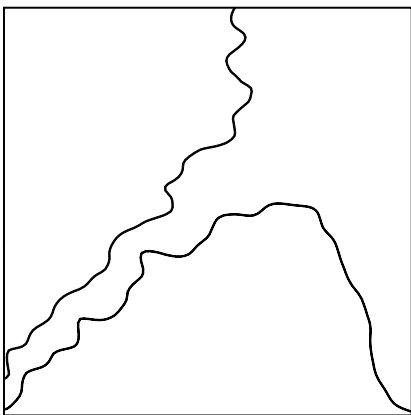
## ACTIVITY 1

### Water Worlds

One of the best ways to understand how to protect our waterways is to learn more about them. This is your chance to learn something new about the water ecosystems in your community and get creative with how you share what makes them special!

#### INSTRUCTIONS:

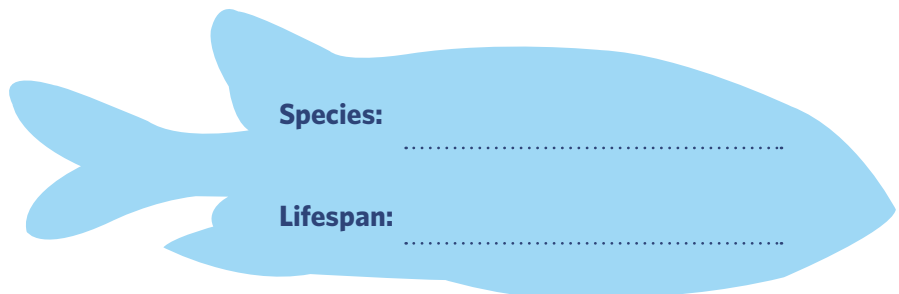
1. Get a large piece of paper and all your favourite drawing supplies together.
2. Using Google Maps, find a waterway close to your house - maybe it is a stream, pond, lake, or even the ocean!
3. Draw an outline of that waterway, or a section of it (e.g., part of the coast, the river banks on either side, etc.)



4. Now look up the kinds of animals and plants you could find there. They might be really small, or they might be types of fish or insects you've never heard of! Type the name of your local waterway, plus "animals", "wildlife", or "plants" into a search engine to help you get started. Discover at least five animals and plants that live in that area and draw them in their habitat. Have fun with it, use lots of colour, and even stick on other things like cut out paper, beads, or string.

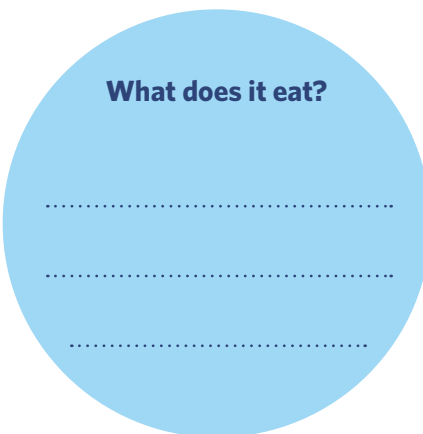
## Making a SPLASH

5. Pick one of the species you've drawn and learn a bit more about it. How long does it live? What does it eat? What kind of habitat does it need to be healthy? Is it at risk, threatened, or endangered? Is it sensitive to pollution?



**Species:** .....

**Lifespan:** .....

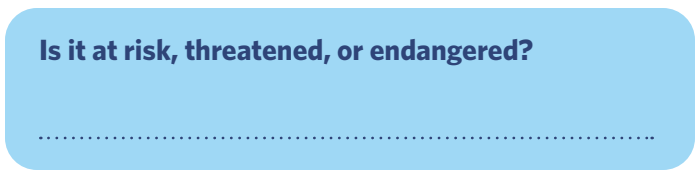


**What does it eat?**

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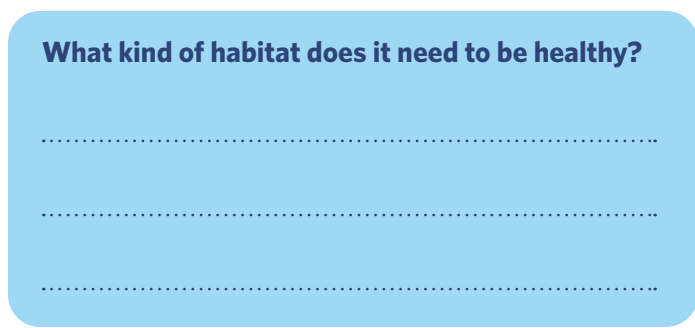
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**Is it at risk, threatened, or endangered?**

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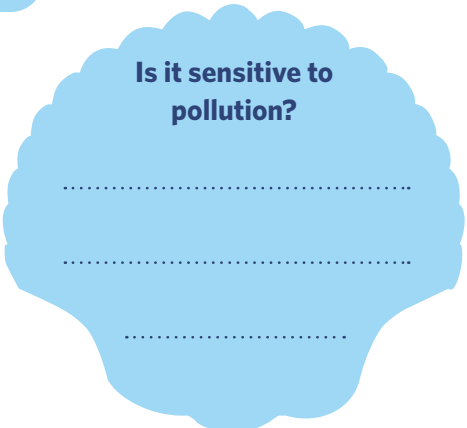


**What kind of habitat does it need to be healthy?**

.....

.....

.....



**Is it sensitive to pollution?**

.....

.....

.....

6. Share your posters with 4-H Canada! Take a picture and share it with us on social media by tagging **@4hcanada** and tell us about what you've discovered!



Want to watch an underwater world? Check out the live cams from the Vancouver Aquarium, which have live streams of their sea otters, jelly fish, and penguins! Dive under the waves without leaving your chair:

 [vanaqua.org/live-cams](http://vanaqua.org/live-cams)





**ACTIVITY 2**

## Plastic Stops Here

Plastic is used in so many different places we can begin to ignore it. It's normal for our foods to come in plastic, our products to come in plastic cases, even our clothes can be made of plastic! This is your chance to better understand the plastic around you, how much there is, and what you can do about it.

Go from room to room in your house and make a tick mark every time you find something made of plastic in the first column. If it's single use - a plastic wrapper, or something that is used one time and then thrown away, make a tick in second column. In the third column write down one thing you found that surprised you. In the last column, write down one thing you think you and your family could do differently to reduce your plastic use in that room.

### DIVING DEEPER

Watch this awesome video about how researchers are trying to address the issue of plastics in our ocean by creating carpet out of discarded fishing nets found floating in the ocean:

 [nationalgeographic.org/video/ocean-plastics/](https://nationalgeographic.org/video/ocean-plastics/)

Room	Plastics (#)	Single Use Plastics (#)	What Surprised Me	What We Can Do Differently
<b>Bedroom (including your closet!)</b>				
<b>Bathroom</b>				



# Making a SPLASH

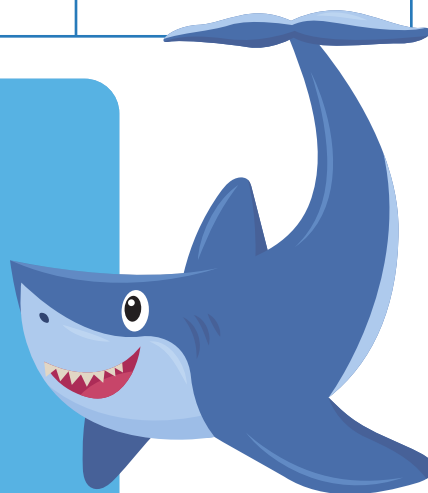
Room	Plastics (#)	Single Use Plastics (#)	What Surprised Me	What We Can Do Differently
Kitchen				
Family room				
Garage/Shed				
Any other rooms you want to explore!				

## DIVING DEEPER

Check out this super cool app called My Little Plastic Footprint for a fun and easy way to measure your plastic use. They've divided people's plastic 'diet' into six areas: bathroom, kitchen, travel, leisure, household, and garden.

In each of these areas, there is a quiz to help you learn everything related to plastic. You can also follow more than 100 tips to reduce your plastic footprint. Learn more here:

👉 [plasticsoupfoundation.org/en/what-we-do/health/my-little-plastic-footprint/](https://plasticsoupfoundation.org/en/what-we-do/health/my-little-plastic-footprint/)





## How can I know what I'm wearing?

Here's an easy way for you to check if the clothes you are wearing might be made of plastic, and potentially be shedding microplastic fibres when they're washed. Look at the label on your clothes that lists the type of fabric used (sometimes this tag is on the side seam) - something like this:



Check the label for any of the following materials:

- Polyester
- Nylon (also known as Polyamide)
- Acrylic
- Viscose
- Rayon
- Fleece
- Microfleece
- Elastane/Spandex/LYCRA®

If you find clothes with these materials (you probably will!), consider taking the following steps to reduce the amount of microfibers they could release when being washed:

1. Wash in cold water.
2. Try to re-wear items a few times before washing (if they're not too dirty!).
3. Look for natural fibres like cotton and wool when you're buying clothes in the future.
4. Celebrate well-loved clothes. Keep wearing your favourite items, or do a clothing swap with friends to try something new! You can also try out thrifting - finding second-hand clothes and giving them another life!





### ACTIVITY 3

## A, B, Seashells

We talked about the danger of acidification to coral reefs and the animals that live in them. Let's see with our own eyes the impact this can have on seashells.

### MATERIALS

- Seashells (provided in kit)
- Water
- White vinegar
- 2 clear glass jars with lids

### INSTRUCTIONS

1. Take two glass jars, each large enough to fit one shell, and put them on the counter.
2. Put one shell in each jar.
3. Pour vinegar into one of the jars. Use enough to cover the shell. Put the lid on.



4. Pour water into the other jar. Use enough water to cover the shell. Put the lid on.
5. Now it's time to make your observations! Record them on the next page - What do you see? What changes? Check every now and then to see what is changing and write it down.
6. After two or three days, checking every so often, pour out the vinegar and water, and look at the shells closely. What happened to the seashells? What has changed, or stayed the same? How might this relate to the acidification of the oceans, and the effect it has on coral?

# Making a SPLASH

## Your observations



**WATER JAR**



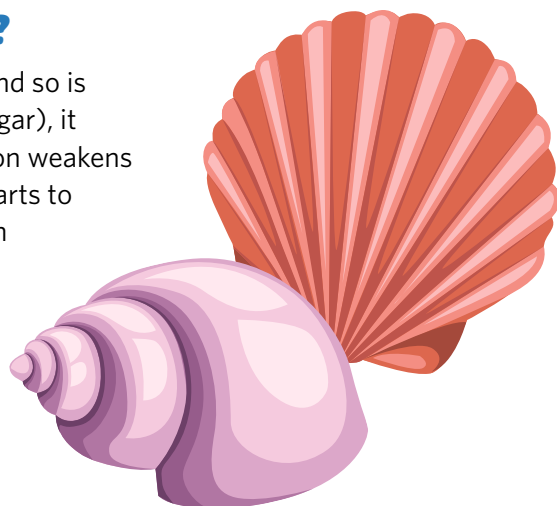
**VINEGAR JAR**

Time (hr)	What do you see? What changes?	Time (hr)	What do you see? What changes?

# Making a SPLASH

## Why does vinegar affect seashells?

Seashells are made of something called calcium carbonate, and so is coral. When calcium carbonate touches an acid (like the vinegar), it reacts and makes little bubbles of carbon dioxide. This reaction weakens the calcium carbonate, dissolving it, which is why the shell starts to break down. Imagine this happening to coral and animals with shells - their 'skeleton' would start to weaken, making them more likely to get hurt, sick, or even die. Even though waterways aren't as acidic as vinegar, we're already seeing acidification of the ocean. A small change in the water acidity is enough to start to change our water ecosystems.



### GLOBAL SNAPSHOTS Australia

Australia is home to the longest coral reef system in the world, The Great Barrier Reef, stretching over 2,300 km.<sup>39</sup> The reef has been damaged from pollution, increasing temperatures, and a decrease of coral species. But there has been some new growth in the past two years that is giving marine biologists hope.<sup>40</sup>

**Look it up!** Do some research and learn about the water ecosystems in this country.

**What are some animals found in this ecosystem?**

.....

.....

.....

**Why is it important to protect this ecosystem?**

.....

.....





### ACTIVITY 3

## Shoreline Sweep!

This is your chance to make direct change to the water ecosystems in your community. The best way to stop the damage caused by plastics and other garbage is to stop them from getting into our waterways in the first place. This activity is more fun with others, so talk to your friends, family, and even your 4-H club about doing the clean-up together.

#### MATERIALS:

- Garbage bags – try using left over grocery bags or other bags from food or shopping
- Gloves – thick work gloves to protect your hands when picking up garbage
- Grabbing stick (optional)
- Sturdy shoes
- Work clothes
- Water and snacks!

#### INSTRUCTIONS:

1. Select the location of your clean-up. It could be a spot where you've noticed a lot of garbage. Consider how you'll get there, and how many of you it will take to clean up the area.
2. Set up your clean-up. Pick a time and date (and maybe a rain date, just in case) and share it with your friends and family that will be joining you. Make sure you have an adult join you, just to be safe around water.

### CHECK OUT

The Great Canadian Shoreline Cleanup for helpful information and tips:

👉 [shorelinecleanup.org](https://shorelinecleanup.org)

You can register your shoreline clean-up, have family and friends sign up to join you, or even turn it into a community event!



# Making a SPLASH

## Clean up plan



- 3.** Assemble your materials. Wear work clothes that you don't mind getting dirty, gloves to protect your hands, and wear shoes that cover your toes and can get muddy. Remember to pack at least one water bottle per person and some snacks.
- 4.** Head out to do your shoreline sweep! Before you begin make sure everyone has water and knows where to meet up after. It's also important to be safe when picking up garbage:
  - Don't touch anything that looks sharp, like glass or metal. Ask an adult to deal with these things carefully.
  - Always pick things up with gloves on. You can also use a grabbing stick if you don't want to touch it.
  - Pick up garbage along the shoreline, but don't go into the water.
- 5.** Have fun during your clean-up! Enjoy the sun, the fresh air, and time with your friends and family. You might even notice some local wildlife as you're cleaning.

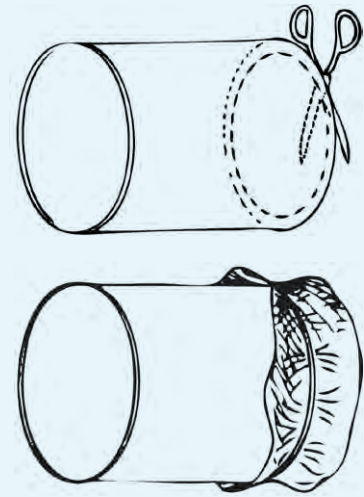
### **This can also be an opportunity to explore the shoreline!**

Take a break, and with adult supervision, see what you can find along the shore. If you want to try looking under the water, you could bring supplies to build an underwater scope:

- a plastic container with a tight-fitting lid (a sour cream or yogurt container would work well)
- plastic wrap or a clear plastic bag
- elastic

Take the container and with help from an adult carefully cut the bottom off. Then cut a large hole in the lid – about 1-2 cm away from the edge of the lid. Put plastic wrap on the top of the container, and hold it in place with the elastic. Then put the lid on the top of the container. Flip it upside down and place the plastic covered end on the surface of the water. Looking through the bottom you cut off, the plastic wrap at the other end will create a clear view of the water below.

1. Take a picture of all the garbage you collect and celebrate your efforts in protecting life below water!
2. Dispose of what you collected in the right way. Your community might have a special drop off spot, or it might be able to go out with your household garbage pickup.
3. Share your success! Let other people in your community know what you've done! Share a picture with your school, or local news station. Encourage others to do their part in keeping our waterways clean and explain why it is important.



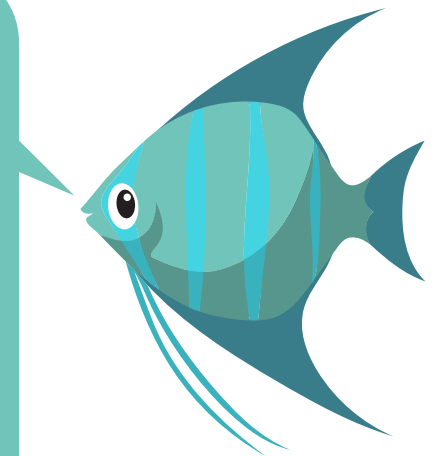
**Top tip:** Before you start your clean-up, contact your local news station and invite them out to take pictures and cover the story. It's a great way to raise awareness and share something positive happening in your community.



### **MAKING WAVES**

Concerned about the litter she would see on her local beaches, Chelsey Munroe, a 4-H member from Nova Scotia wanted to do something about it! She created a science fair project for the 4-H Canada Science

Fair to better understand what kinds of garbage were washing up on beaches in her community. Visiting 14 beaches, she identified a variety of different types of litter. Knowing where it was coming from (e.g., fishing industry, coffee cups, cigarette butts, etc.) means we can work to track and target garbage in those areas. Learn more about the 4-H Canada Science Fair and how you can discover and innovate through your own project here: [4-h-canada.ca/sciencefair](https://4-h-canada.ca/sciencefair).



# Be a Life Below Water Champion!

With everything you've learned about SDG 14 - Life Below Water, this is your chance to share it with your friends, family, and the world! This is a global issue, and we all have a part to play in raising awareness and encouraging others to protect our water ecosystems, and make sustainable water choices in our homes, communities, countries, and around the world!

**YOUNG PEOPLE  
MAKING THINGS  
HAPPEN**



## GIVE THESE SOME THOUGHT

**What was the most interesting thing you learned from Making a Splash?**

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**What was something that surprised you as you went through the guide and activities?**

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**How has your understanding and thoughts about protecting water ecosystems changed?**

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**What is something you have done to reduce your use of plastics?**

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**What is one thing about protecting our waterways you could work to improve in your own life?**

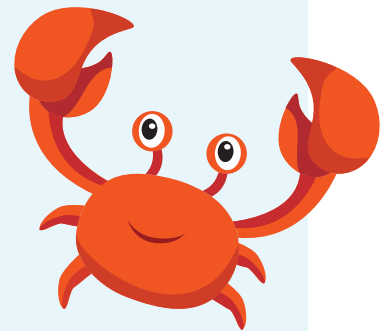
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## **Now take action – challenge yourself to make a big impact!**

- Post on social media. If you have an account, share:
  - » What you've learned!
  - » The impact of plastics, pollution, and over-fishing.
  - » The steps you're taking to better protect our waterways.
  - » Invite others to join you in learning more, making sustainable choices, and discussing the ways they can make a difference!
  - » And remember, we love to hear from you and support your learning, so share your posts with us by tagging **@4hcanada** on Instagram, Facebook, or Twitter.
- Talk to your friends and family about what you've learned, include them in these activities, or encourage them to read this resource too!
- Post a sign in your window, or on your lawn, encouraging others to support the SDG 14 - Life Below Water.
- Talk to your teachers and school administration about what actions can be taken at school to support SDG 14. Maybe you can start a club or school-wide initiative!
- Volunteer with a local environmental organization and see what can be done to protect your own community's waterways.
- Reach out to your local politicians - community, provincial, federal - and ask them what they are doing to support SDG 14. No matter which political party they are part of, they should be able to give you an answer!
- Your own idea of how to make change:



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# Reflection

You have just completed a series of activities about protecting our water ecosystems, and we hope you feel like you've achieved the goals we mentioned in the beginning! When we learn and do something new, one of the key steps is to reflect at the end of it all. How did it go? What was your favourite part? What surprised you? What did you achieve? What would you do differently next time?

Consider the following questions and see how they link up to the skills you've developed in Making a Splash:

REFLECTION QUESTIONS	OUTCOMES
<b>How have you advocated for protecting our water ecosystems, and encouraged other to join you?</b>	Leadership development
..... ..... .....	
<b>What skills have you learned by going through these activities?</b>	Skill mastery
..... ..... .....	
<b>What positive change can you make by supporting the Life Below Water SDG?</b>	Positive values
..... ..... .....	
<b>What responsibility do you feel you have in supporting sustainable use of our oceans, lakes, and rivers?</b>	Responsibility
..... ..... .....	



**What goals have you set for yourself to try to reduce your impact on our water ecosystems?**

*Planning and decision making*

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**How will you make your mark as a member of your community, and as a global citizen?**

*Sense of purpose*

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**What was the most fun part of this kit? What was something you learned in a hands-on way? Did anyone help you with your learning - acknowledge them here.**

*Learn To Do By Doing*

*Fun*

*Supportive adults*

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Thank you for joining 4-H Canada, and youth across the country, in learning more about protecting our water ecosystems, gaining skills, and having fun with sustainability, our environment, and with science as you explored Making a Splash We look forward to seeing what you've accomplished (remember to share it with us by tagging **@4hcanada** on Instagram, Facebook, or Twitter!) we hope you'll try out some of the other opportunities available through 4-H Canada!



# Making a SPLASH

## References

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<https://sdgs.un.org/goals/goal14>  
<https://sdg-tracker.org/oceans>  
<https://oceanservice.noaa.gov/facts/microplastics.html>  
<https://www.nature.com/articles/d41586-021-01143-3>

## Photos

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## Endnotes

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- 3 <https://www.nrdc.org/experts/lauren-kubiak/marine-biodiversity-dangerous-decline-finds-new-report>
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# NOTES

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