



**OCEAN
WISE**

Species at Risk

Student Workbook
Grades 7 - 8

CONTENTS

- 0 Land Acknowledgement
- 1 Climate Change - Humpback Whale
- 2 Ocean Pollution - Killer Whale
- 3 Fishery Bycatch - Great White Shark
- 4 Plastic Pollution - Hawksbill Turtle
- 5 Habitat Loss - Sea Otter

LAND ACKNOWLEDGEMENT

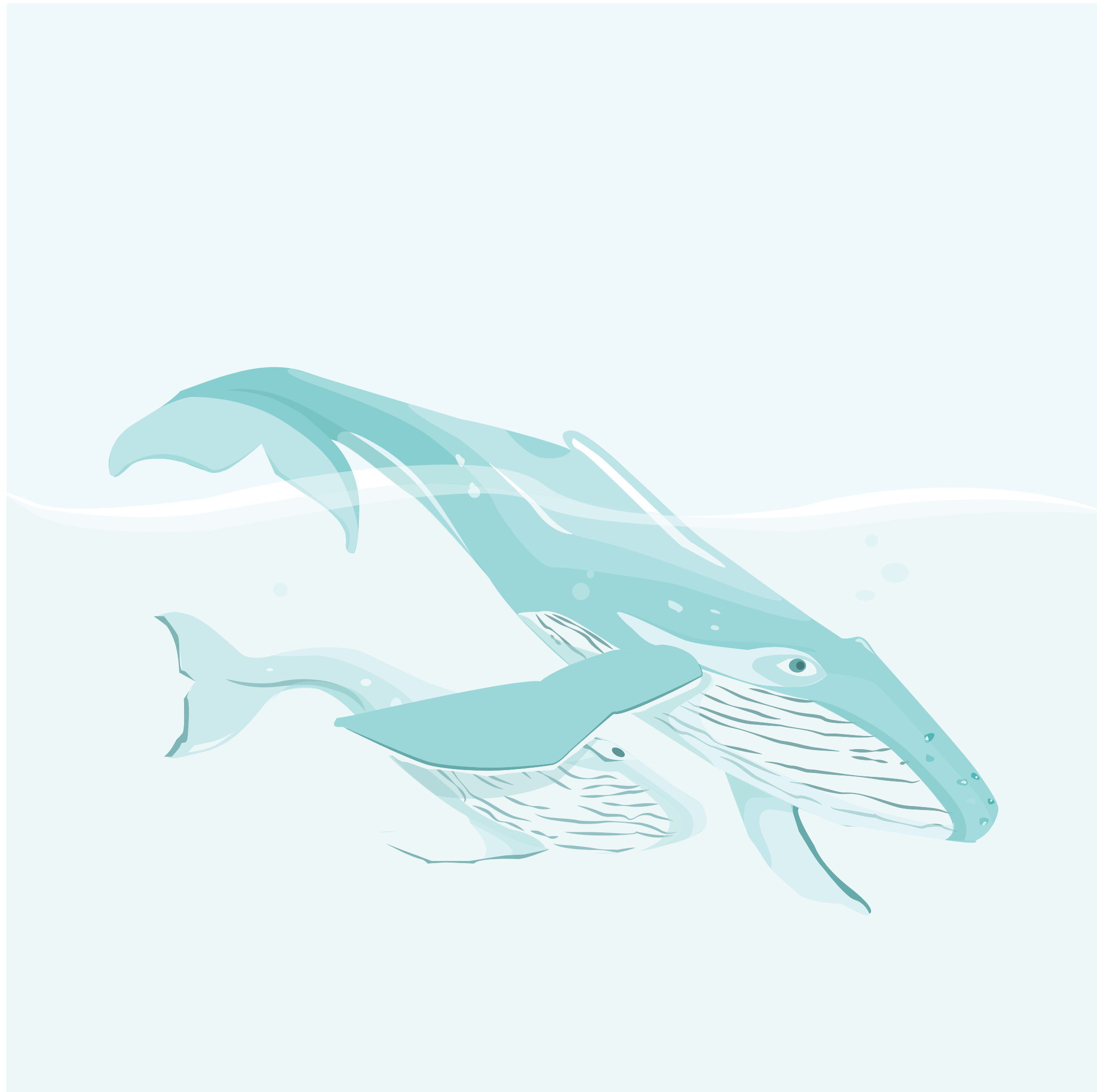
We acknowledge and are grateful that many Ocean Wise employees work and play on the traditional, ancestral and unceded territories of the x^wməθk^wəyəm (Musqueam), S_kwxwú7mesh (Squamish), and səliłwətaʔt (Tsleil-Waututh) peoples.



Lesson 1

Climate Change - Humpback Whale





ACTIVITIES

1. Make a poster advocating for the protection of a marine species by demonstrating how it can help regulate global climate change. When conducting your research keep in mind:

- How do the characteristics of your selected species contribute (directly or indirectly) to keeping ocean environments healthy?
- How much carbon does your species store?
- Does your species help with phytoplankton or algae growth?

CLIMATE CHANGE
Humpback Whale

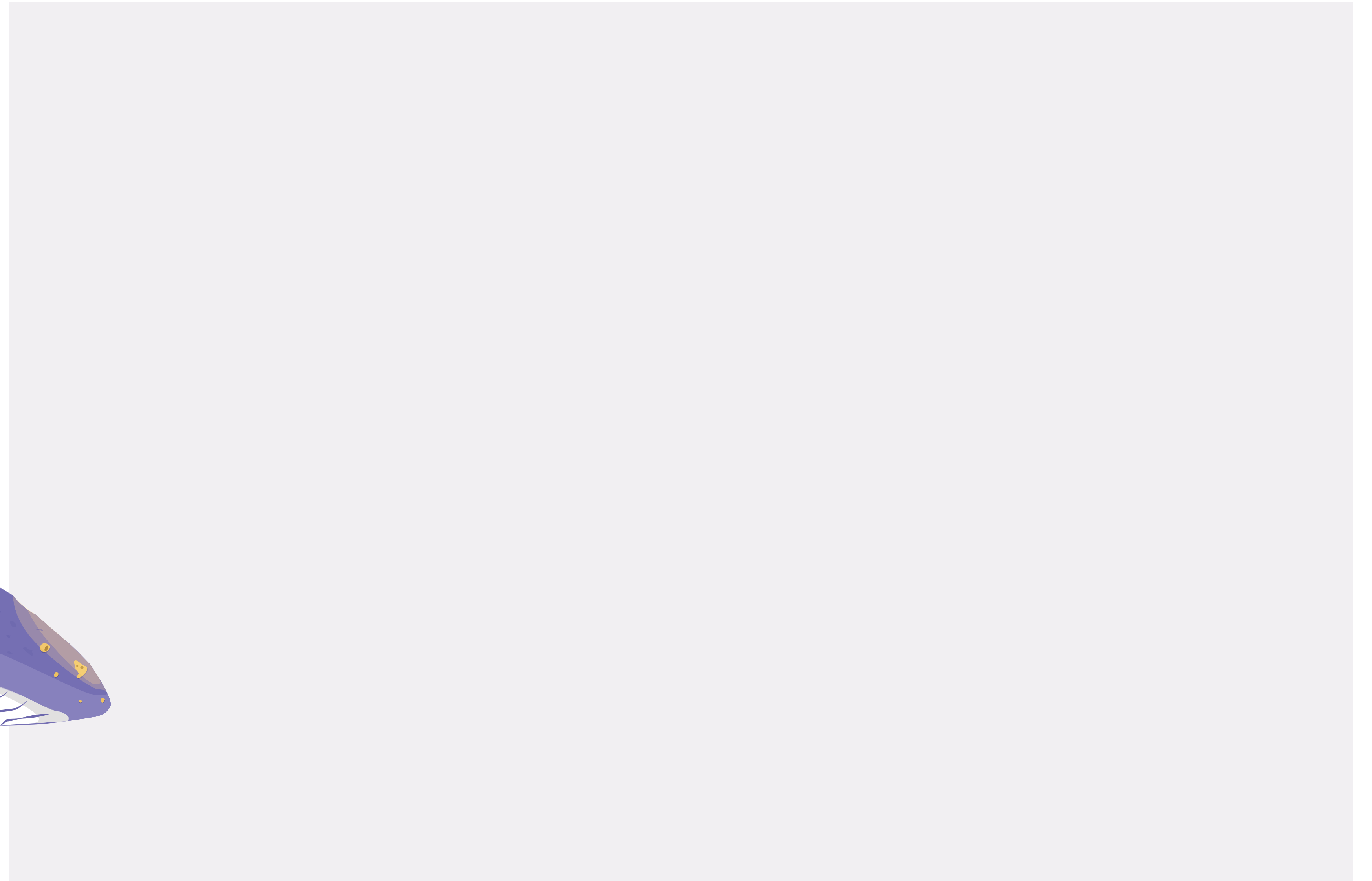
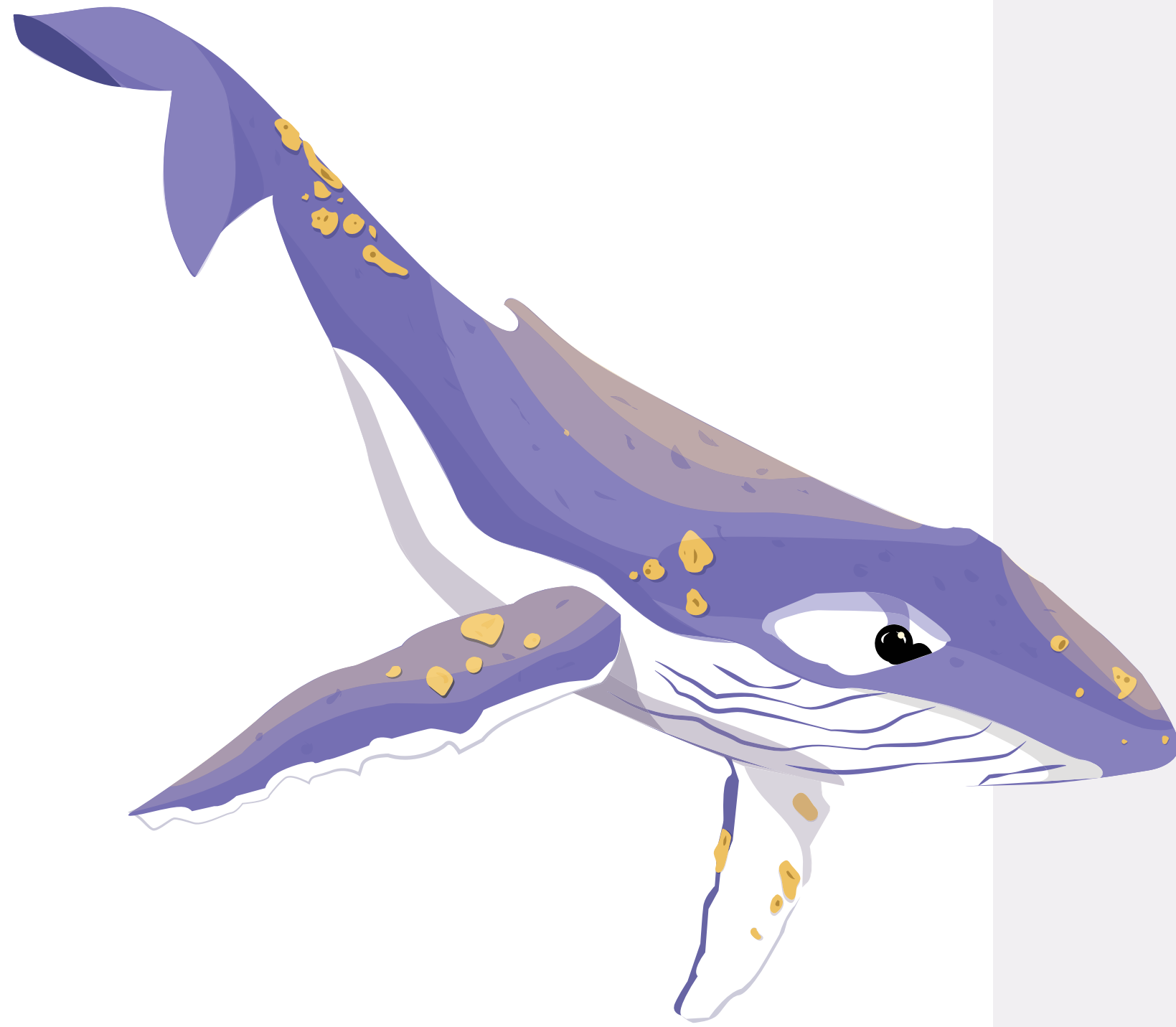
OCEAN POLLUTION
Killer Whale

FISHERY BYCATCH
Great White Shark

PLASTIC POLLUTION
Hawksbill Turtle

HABITAT LOSS
Sea Otter

2. Take a look at the Carbon Dioxide and Global Temperature topics on the [Climate Change Machine by NASA](#) and play with the timeline. As time progresses, do you see any changes? Are there any similarities in the intensity, spatial, or other patterns you observed between each visualization?



2.a) Calculate your carbon footprint using the [Footprint Calculator](#). Review your results and the different areas your actions contribute to your carbon and ecological footprint. How can you reduce your footprint?

b) Think of other entities, especially large corporations, and how they contribute to their carbon footprint and climate change. How can you urge them to reduce their carbon footprint?

4. Draw a cycle which illustrates how climate change impacts Indigenous communities who have a strong relationship with whales, such as the humpback whale.

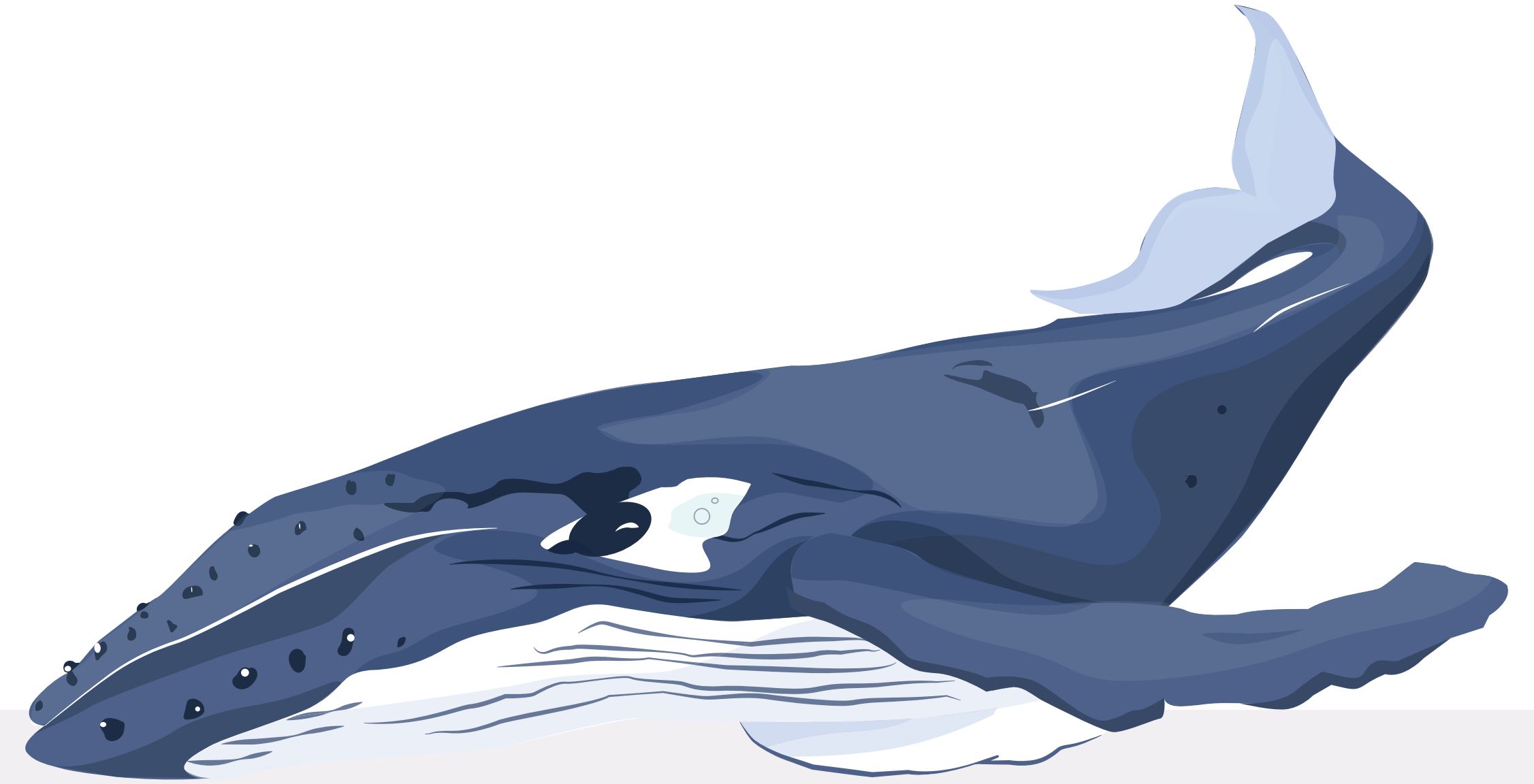


THOUGHTBOOK

This lesson focused on the different ways we contribute to climate change and how we can change our practices to reduce our impacts. Take time to journal on your thoughts and things you have learned.

REFLECT

1. What are the most awe-inspiring ways that the ocean supports life on earth?



2. What are the most significant ways that the changing climate can impact ocean health? 3. What are some of the ways marine animals can help mitigate climate change?



TAKE ACTION

Report a whale sighting using the [*Ocean Wise Whale Report Alert System*](#).

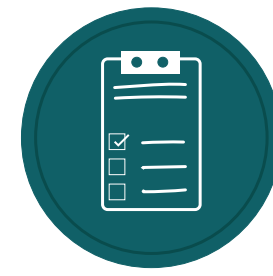
THE WHY

Reporting a whale sighting provides researchers with information about the abundance of a species in order to properly determine the status of the population (i.e., improving, steady or declining). It also informs scientists about the distribution of whales and how feeding and breeding grounds may be impacted due to climate change. With a better understanding of the abundance and distribution of whales, people in the vicinity can be made aware of their presence and reduce the risk of vessel strikes and other human inflicted disturbances. By helping provide more information to scientists and the community, you can have a role in contributing to climate change mitigation and conservation measures to help protect species like the humpback whale!



Lesson 2

Ocean Pollution - Killer Whale



ACTIVITIES

1. Read [*Ocean Wise Blog: Tracking Contaminants in Killer Whale Habitats by Ocean Wise*](#) and answer the following questions while keeping in mind the following:

- Are your top predators herbivores, omnivores, or carnivores?
- At which trophic level does the pollutant enter the trophic structure?
- Is the top predator directly or indirectly affected by the pollutant?
- From the information in the video you just watched, which animal in your trophic structure would you say is the most affected by the pollutant?

a. Select a top ocean predator and draw their respective food chain.



CLIMATE CHANGE
Humpback Whale

OCEAN POLLUTION
Killer Whale

FISHERY BYCATCH
Great White Shark

PLASTIC POLLUTION
Hawksbill Turtle

HABITAT LOSS
Sea Otter

b) Research an ocean pollutant that affects this food chain.

Name of Ocean Pollutant:

c) At which trophic level (i.e., at which species) does the pollutant enter the trophic structure?

Trophic Level / Species:

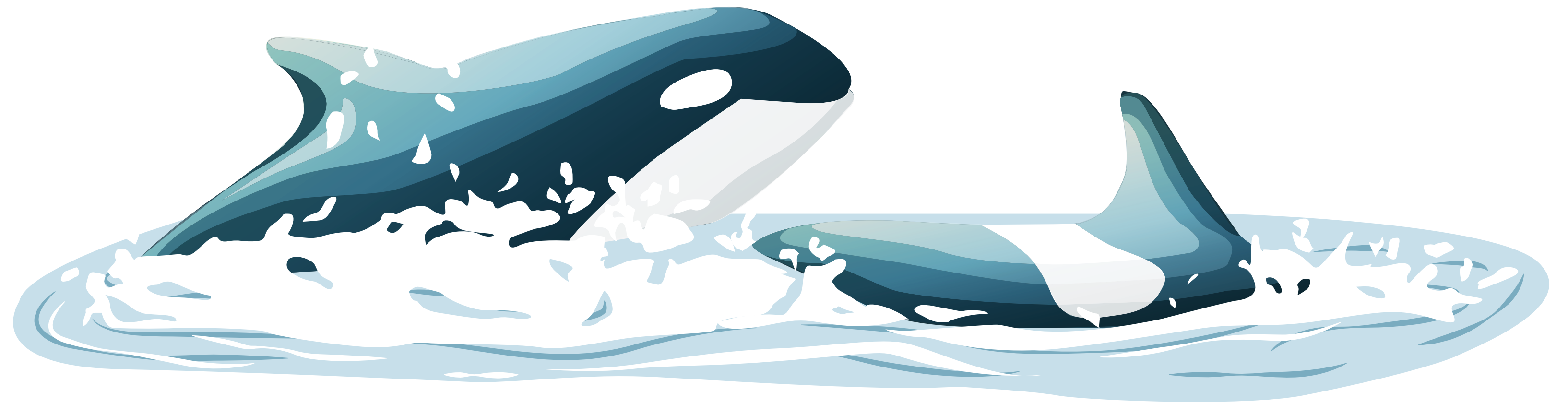
d) Does the pollutant have an effect on the top predator? If so, how?

2. a) Look at the [*Ocean Wise Pollution Tracker by Ocean Wise*](#) interactive map to select one pollutant and a coastal location where it was measured.

Location of Pollutant:

Name of Pollutant:

Concentration of Pollutant:



b) How may this pollutant affect ocean health and coastal Indigenous communities?

c) How may banning this pollutant improve ocean health and benefit coastal Indigenous communities?

d) Create a poster advocating for the ban of this ocean pollutant. Include reasoning and specific examples of actions individuals can take to protect the environment from these pollutants and how it may benefit Indigenous communities.

3. Create a poster to advocate saving an aquatic species at risk. You can use the [*IUCN Red List*](#) to search for a species at risk.



THOUGHTBOOK

In this lesson, you learned about ocean pollution and how it impacts not one, but nearly all species in a food chain or ecosystem, as well as pollution's negative impact on all species, especially those most at risk. Take a moment to pause and reflect on what you have learnt and how it made you feel.

REFLECT

1. What are the most significant ways humans impact ocean health?



2. What pollutants have the most impact on ocean health?

3. How do pollutants affect all species in an ecosystem? Why are certain species more affected by ocean pollutants than others?



TAKE ACTION

Take the [*Ocean Wise Plastic Pledge*](#). Reduce your consumption of single-use plastic, for example: bring a reusable water bottle or reusable containers in your lunchbox!

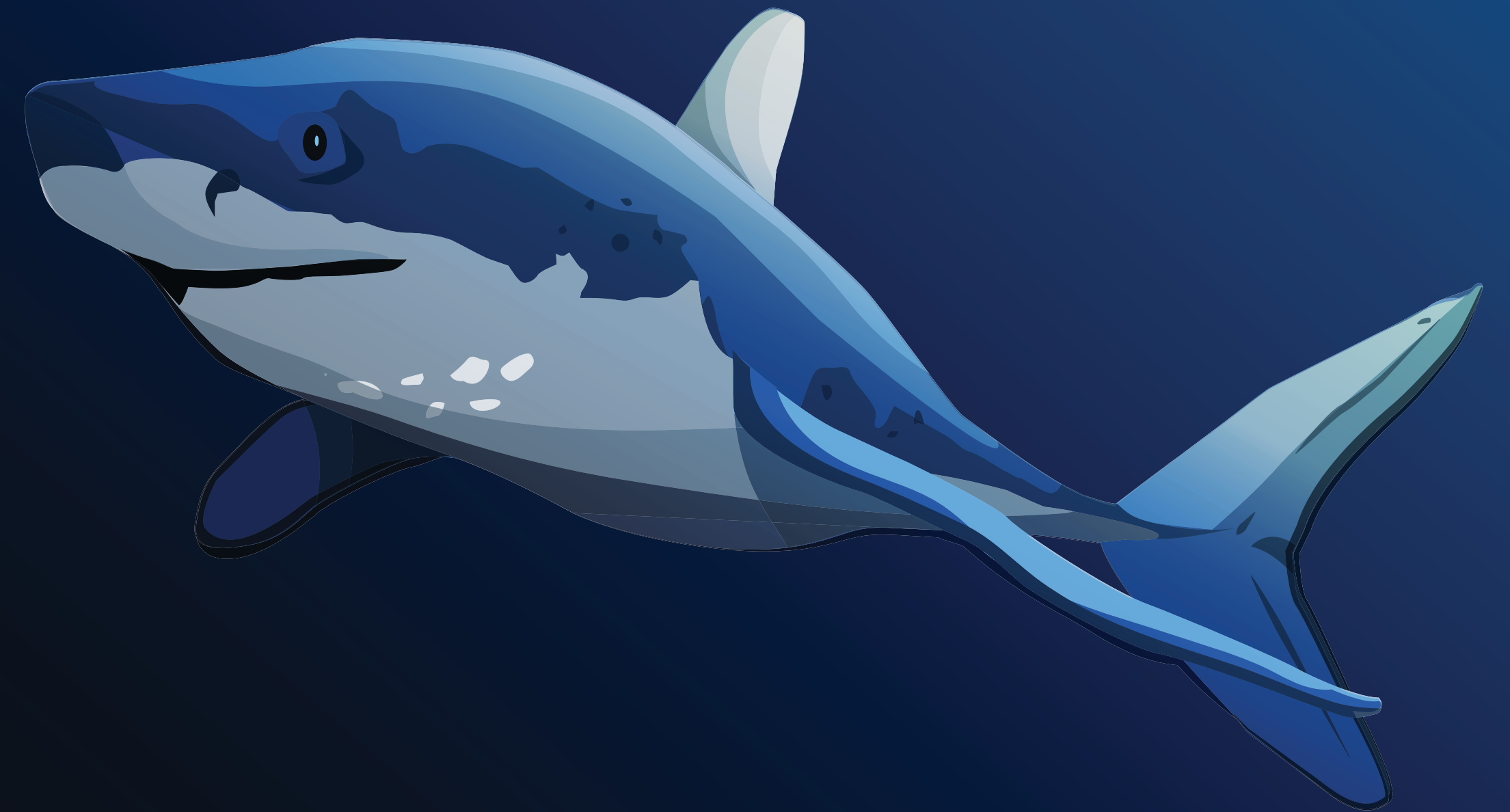
THE WHY

Not only does reducing your consumption of single-use plastic (such as plastic straws or bags) prevent plastics from entering the environment, but it also discourages their production and the release of harmful chemicals used to create them (including industrial chemicals harming killer whales!) By taking Ocean Wise's Plastic Pledge and reducing your use of plastics, you are contributing to the reduction of not one, but two types of ocean pollutants from entering our waterways.



Lesson 3

Fishery Bycatch - Great White Shark





ACTIVITIES

Using the [OCEARCH Shark Tracker](#), report on a tagged shark that interests you. Get creative and present the information however you like. Your presentation should include:

- Species Name
- Given Name
- Tag Date
- Last Known Location
- Description of Tracked Movement
- Fun Fact

CLIMATE CHANGE
Humpback Whale

OCEAN POLLUTION
Killer Whale

FISHERY BYCATCH
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PLASTIC POLLUTION
Hawksbill Turtle

HABITAT LOSS
Sea Otter

Species Name:

Given Name:

Tag Date:

Last Known Location:

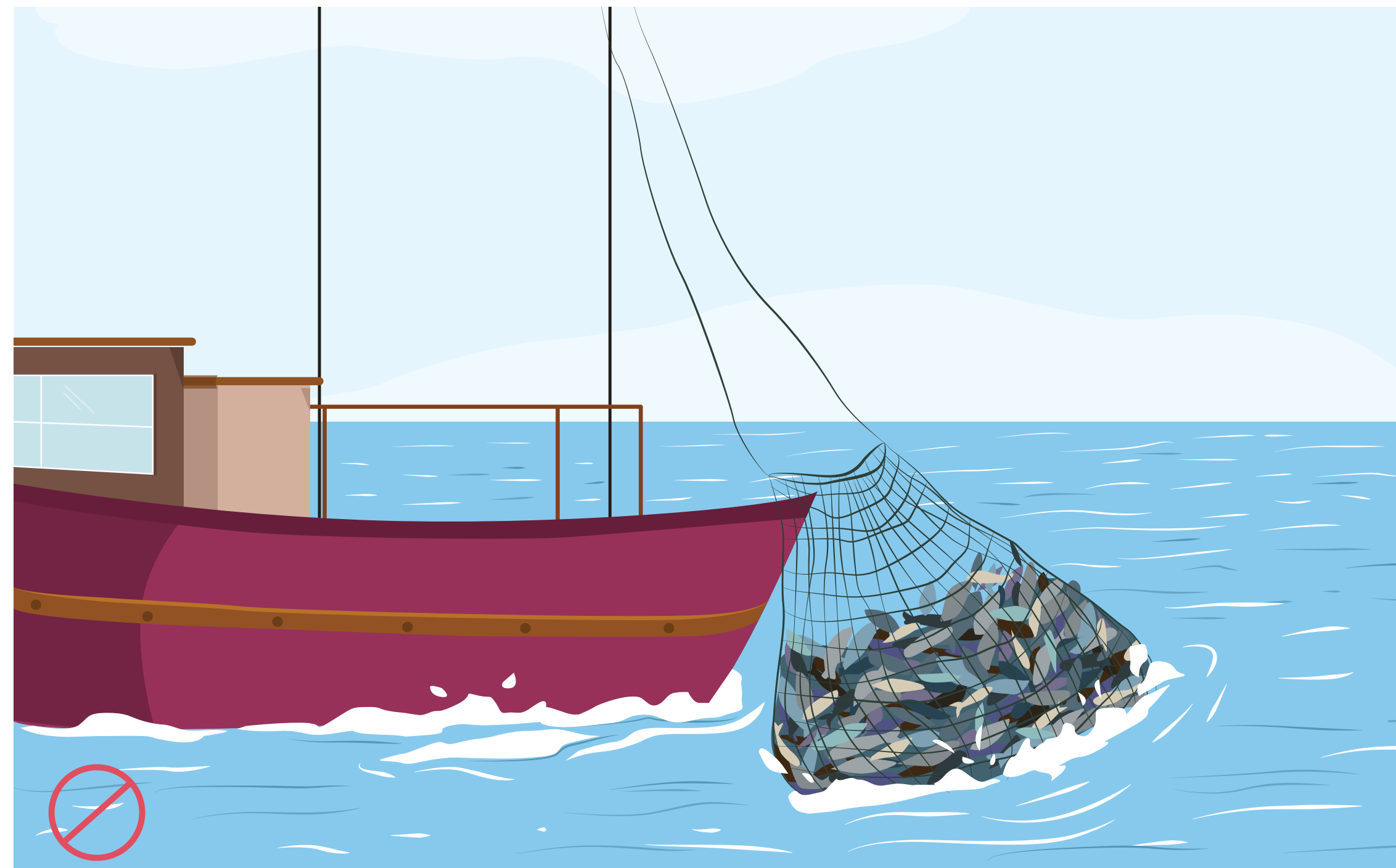
Description of Tracked Movement:

Fun Fact:



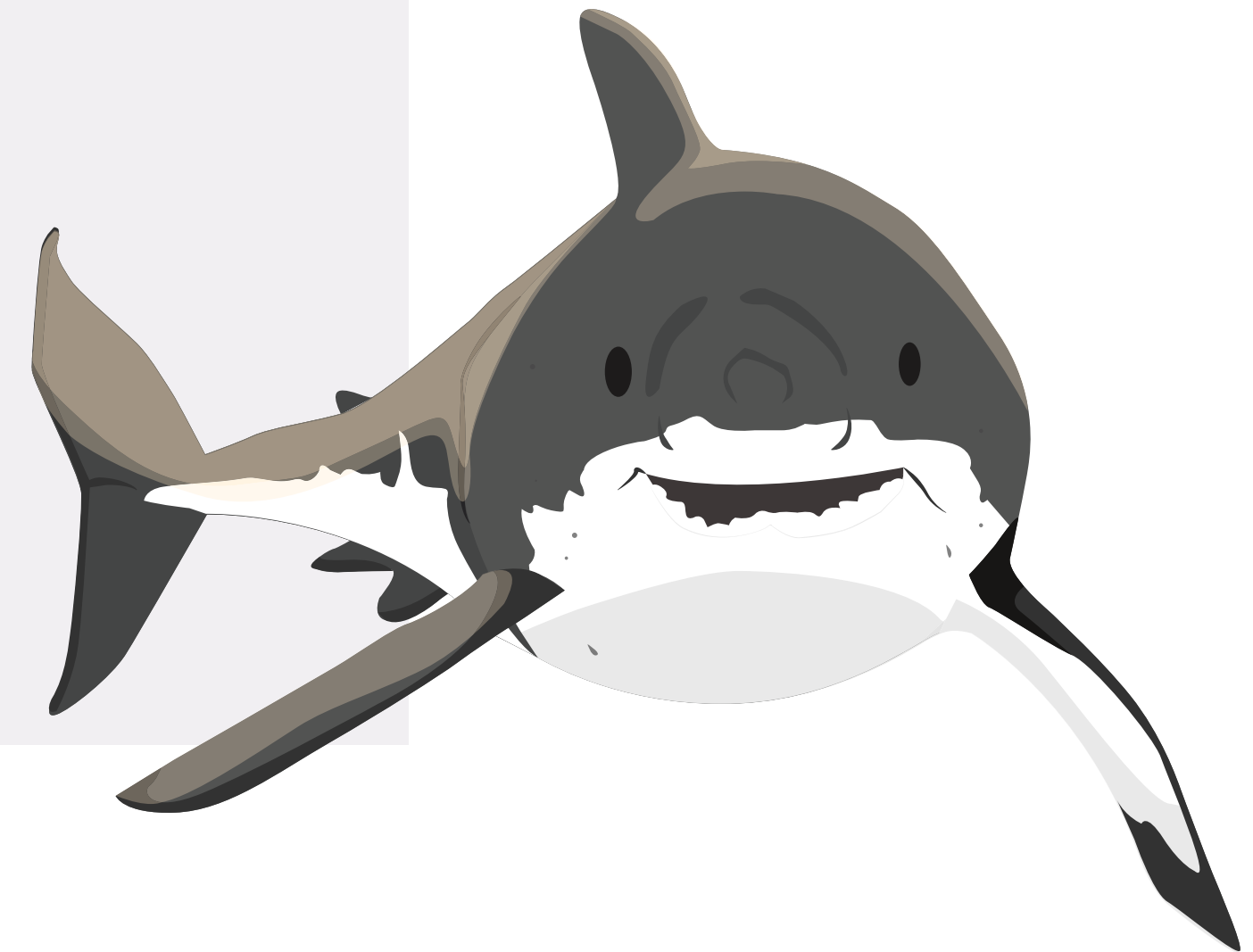
THOUGHTBOOK

From these activities, you should understand how unsustainable fishing practices, such as overfishing and by-catch, impact ocean health. Reflect on the environmental cost of the overexploitation of ocean resources such as seafood.



REFLECT

1. What are the differences between the sustainable and unsustainable use of ocean resources?



2. What are the most damaging effects that human seafood consumption has on ocean ecosystems? How has our reliance on seafood as food impacted ocean health?

3. How can traditional indigenous knowledge and practices inform fisheries on how to use ocean resources sustainably and respectfully?



The Ocean Wise Seafood symbol is your assurance of an ocean-friendly choice.



TAKE ACTION

Use the [Ocean Wise Seafood Partner Map](#) and the [Ocean Wise Seafood Recommendations](#) before purchasing a seafood product and look for our logo on seafood packaging!

THE WHY

Ocean Wise’s seafood recommendations identify sustainably farmed or fished seafood products. By using the variety of tools created by Ocean Wise, such as the Seafood Partner Map and Seafood Recommendations Search Tool, you can easily make an informed choice regarding the sustainability of the seafood that you are purchasing. By doing so, you will be directly contributing to ocean sustainability by supporting fisheries which have implemented the appropriate measures to protect and respect our ocean and its resources and encouraging others to do the same.

Lesson 4

Plastic Pollution - Hawksbill Turtle





ACTIVITIES

1. GARBAGE CLEAN UP X CITIZEN SCIENCE

a) Identify and record the different types of plastic garbage gathered below.



SHORELINE CLEANUP

Presented by Loblaw Companies Limited

Individual Data Card

SITE INFORMATION:

Cleanup Site Name	Cleanup Date	
<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>	
Site Coordinator	Distance Cleaned (KM)	
<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>	
Total Weight (KG)	# of Garbage Bags	# of Recycling Bags
<input style="width: 30%;" type="text"/>	<input style="width: 30%;" type="text"/>	<input style="width: 30%;" type="text"/>
# of Volunteers Working On This Card	Most Unusual Item	
<input style="width: 40%;" type="text"/>	<input style="width: 60%;" type="text"/>	

Citizen scientists: Pick up all litter that you find and record data only for the items listed on the back. Please do not use words or check marks. Only numbers are useful. Please return this card to the Site Coordinator when complete.

EXAMPLE:

Plastic Bags:		TOTAL #
	=	8

PRESENTING SPONSOR

NATIONAL SPONSORS

Trash Collected

<p>MOST LIKELY TO FIND ITEMS:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>Cigarette Butts:</td><td style="text-align: right;">=</td></tr> <tr><td>Beverage Cans:</td><td style="text-align: right;">=</td></tr> <tr><td>Bottle Caps:</td><td style="text-align: right;">=</td></tr> <tr><td>Coffee Cups and Lids:</td><td style="text-align: right;">=</td></tr> <tr><td>Food Containers: <small>(i.e. yogurt or snack cups, milk containers)</small></td><td style="text-align: right;">=</td></tr> <tr><td>Food Wrappers:</td><td style="text-align: right;">=</td></tr> <tr><td>Glass Bottles:</td><td style="text-align: right;">=</td></tr> <tr><td>Paper:</td><td style="text-align: right;">=</td></tr> <tr><td>Plastic Bags:</td><td style="text-align: right;">=</td></tr> <tr><td>Plastic Bottles:</td><td style="text-align: right;">=</td></tr> <tr><td>Plastic Cups:</td><td style="text-align: right;">=</td></tr> <tr><td>Six Pack Holders:</td><td style="text-align: right;">=</td></tr> <tr><td>Straws:</td><td style="text-align: right;">=</td></tr> <tr><td>Takeout Containers:</td><td style="text-align: right;">=</td></tr> <tr><td>Utensils:</td><td style="text-align: right;">=</td></tr> </table> <p>TOP 3 ADDITIONAL ITEMS:</p> <p style="font-size: x-small;">Identify the top 3 items found that are not listed on the card</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>1:</td><td style="text-align: right;">=</td></tr> <tr><td>2:</td><td style="text-align: right;">=</td></tr> <tr><td>3:</td><td style="text-align: right;">=</td></tr> </table>		TOTAL #	Cigarette Butts:	=	Beverage Cans:	=	Bottle Caps:	=	Coffee Cups and Lids:	=	Food Containers: <small>(i.e. yogurt or snack cups, milk containers)</small>	=	Food Wrappers:	=	Glass Bottles:	=	Paper:	=	Plastic Bags:	=	Plastic Bottles:	=	Plastic Cups:	=	Six Pack Holders:	=	Straws:	=	Takeout Containers:	=	Utensils:	=		TOTAL #	1:	=	2:	=	3:	=	<p>FISHING GEAR:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>Fishing Buoys, Pots or Traps:</td><td style="text-align: right;">=</td></tr> <tr><td>Fishing Net and Line:</td><td style="text-align: right;">=</td></tr> <tr><td>Rope (1 metre = 1 piece):</td><td style="text-align: right;">=</td></tr> </table> <p>PRODUCT PACKAGING</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>Soft Plastic Packaging:</td><td style="text-align: right;">=</td></tr> <tr><td>Rigid Bottles and Jugs:</td><td style="text-align: right;">=</td></tr> </table> <p>PERSONAL HYGIENE:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>Diapers, Wipes, Tampons, Condoms:</td><td style="text-align: right;">=</td></tr> <tr><td>Syringes:</td><td style="text-align: right;">=</td></tr> <tr><td>Personal Protective Equipment: <small>(i.e. gloves, masks)</small></td><td style="text-align: right;">=</td></tr> </table> <p>TINY TRASH LESS THAN 2.5 CM:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>Styrofoam Pieces:</td><td style="text-align: right;">=</td></tr> <tr><td>Plastic Pieces:</td><td style="text-align: right;">=</td></tr> </table> <p>OTHER TRASH:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;"></td> <td style="width: 20%; text-align: right; font-size: small;">TOTAL #</td> </tr> <tr><td>Balloons:</td><td style="text-align: right;">=</td></tr> <tr><td>Clothing, Shoes:</td><td style="text-align: right;">=</td></tr> <tr><td>Construction Materials:</td><td style="text-align: right;">=</td></tr> <tr><td>Large Styrofoam:</td><td style="text-align: right;">=</td></tr> <tr><td>Tires:</td><td style="text-align: right;">=</td></tr> <tr><td>Toys:</td><td style="text-align: right;">=</td></tr> </table>		TOTAL #	Fishing Buoys, Pots or Traps:	=	Fishing Net and Line:	=	Rope (1 metre = 1 piece):	=		TOTAL #	Soft Plastic Packaging:	=	Rigid Bottles and Jugs:	=		TOTAL #	Diapers, Wipes, Tampons, Condoms:	=	Syringes:	=	Personal Protective Equipment: <small>(i.e. gloves, masks)</small>	=		TOTAL #	Styrofoam Pieces:	=	Plastic Pieces:	=		TOTAL #	Balloons:	=	Clothing, Shoes:	=	Construction Materials:	=	Large Styrofoam:	=	Tires:	=	Toys:	=
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Thank you for contributing to trash free shorelines.

[#teamshoreline](#)
 /shorelinecleanup
 @shorelinecleanup
 @cleanshorelines

- b) Triage the garbage you gathered and dispose of it in the appropriate bins.
- c) Open the [*iNaturalist app*](#) OR take out your local species ID guide and Identify animals or insects within your designated clean-up area.

Notes For Species ID Guide Users:

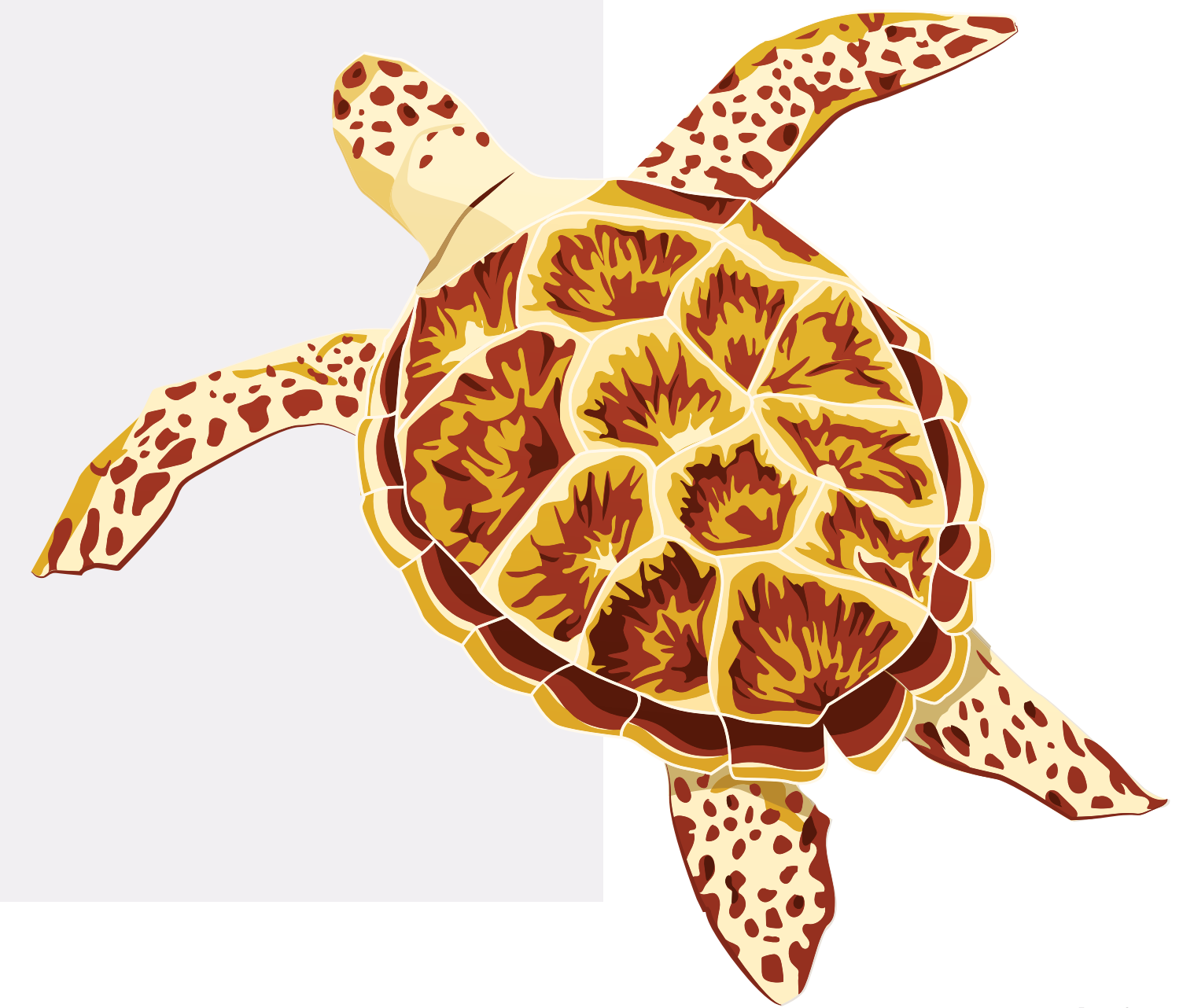
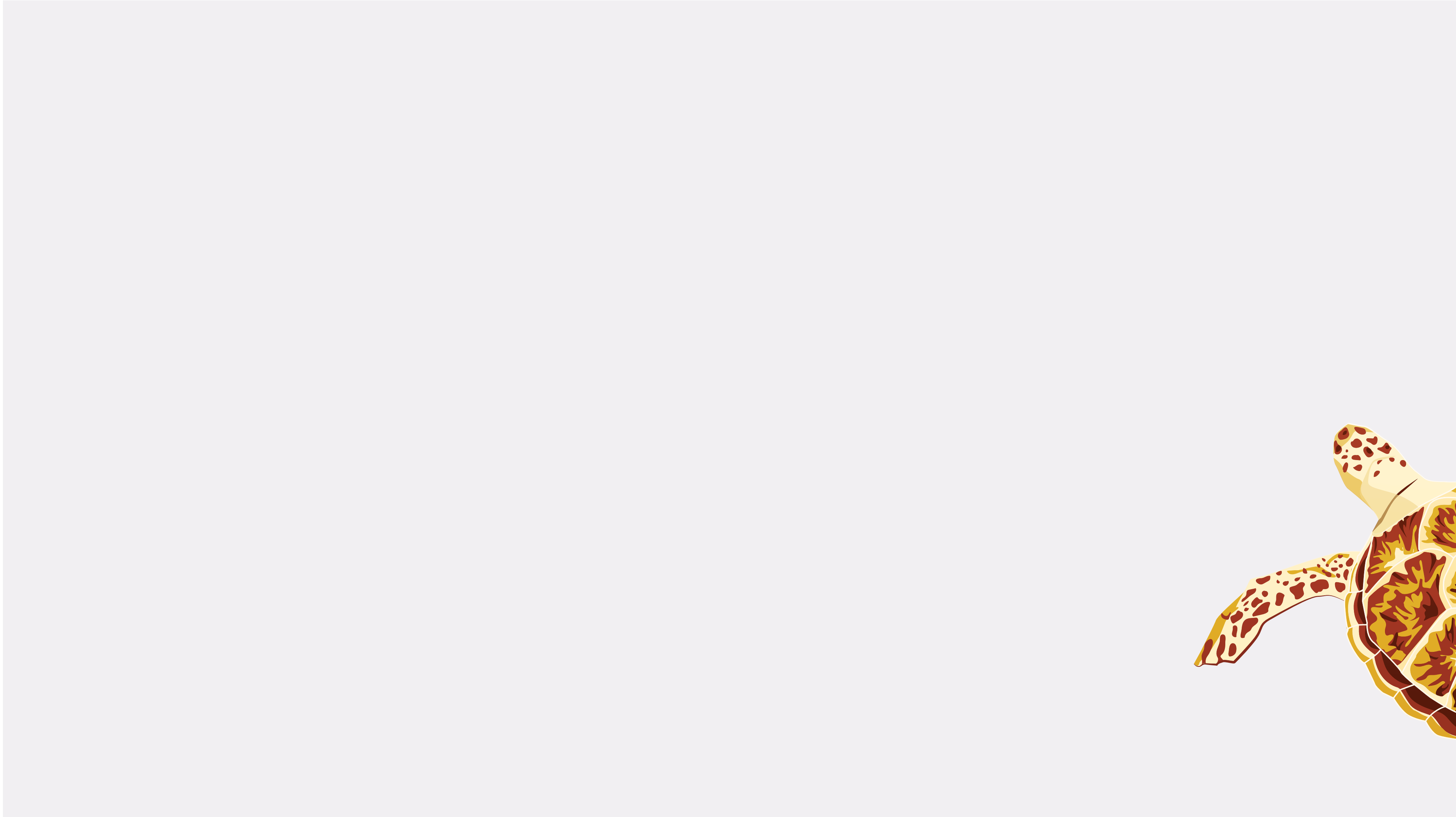
CLIMATE CHANGE
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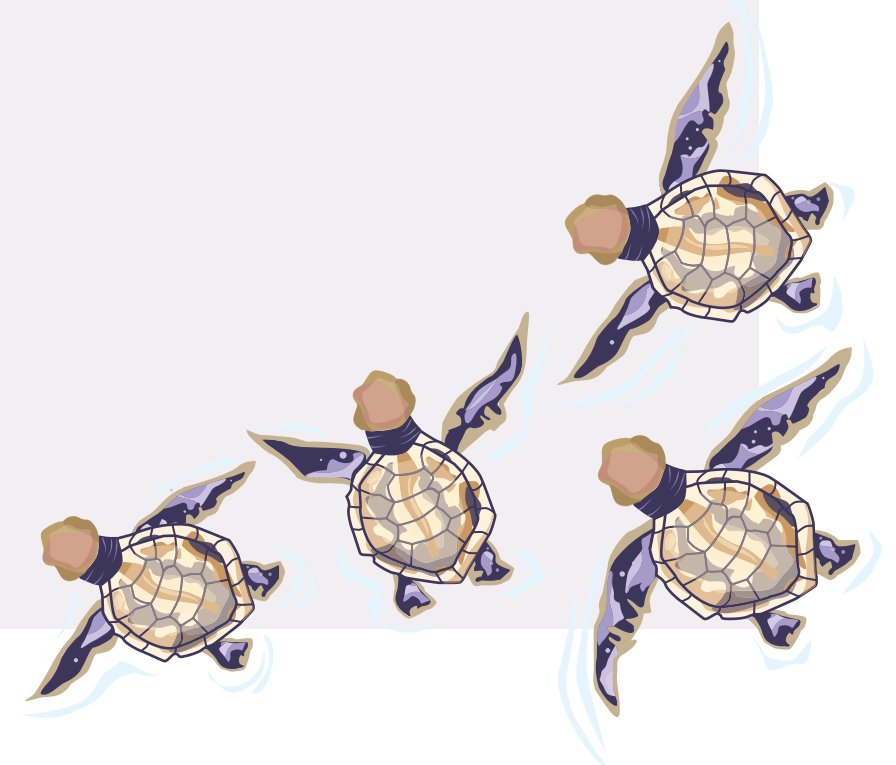
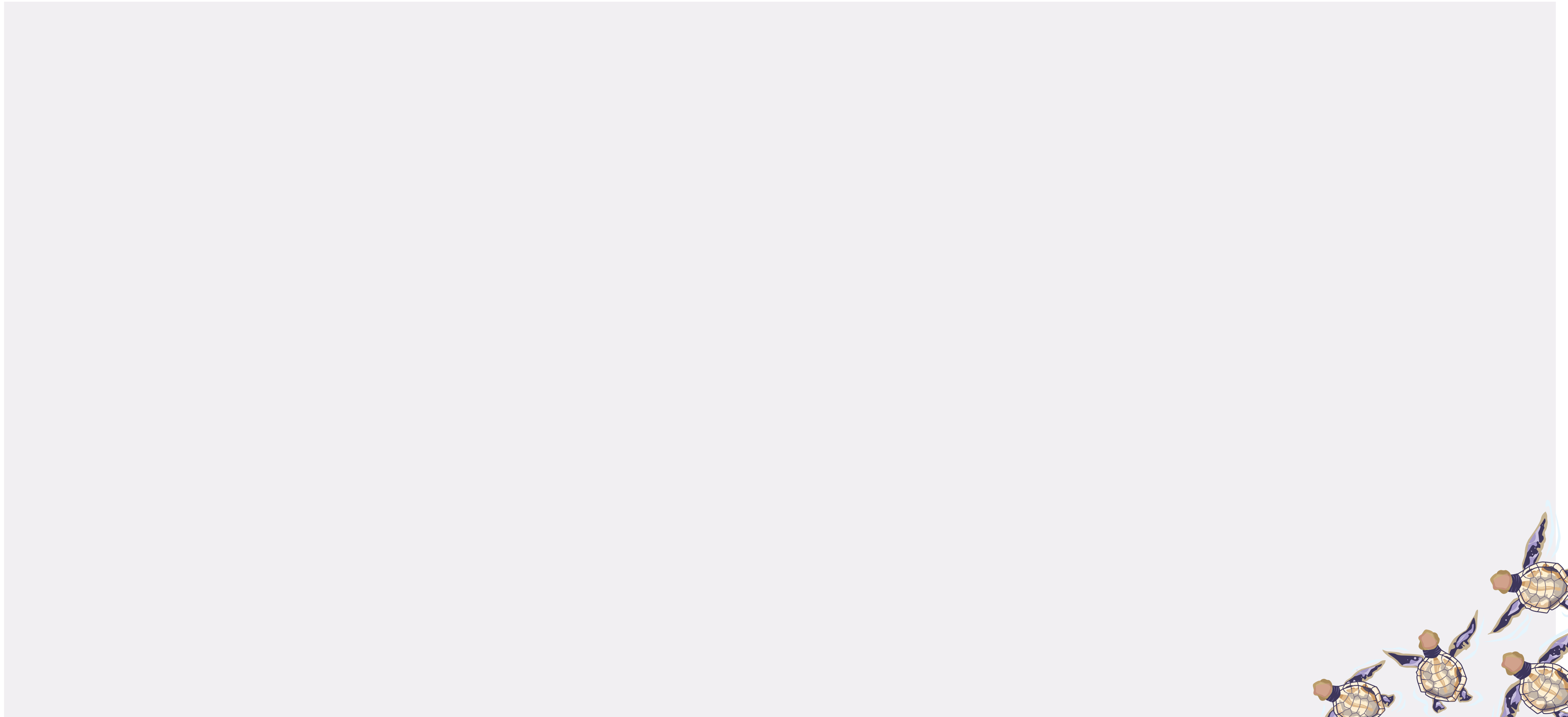
HABITAT LOSS
Sea Otter



d) How could the garbage you collected, especially the plastic, harm the species you identified?

e) How may the same plastic pollution harm the hawksbill turtle if it ended up in our waterways?

2. Create a poster advocating for alternatives to single-use plastics. Use the video for inspiration and include sea turtles as a target species in your poster.





THOUGHTBOOK

Now that you have participated in your own garbage clean up and/or citizen science project targeting plastic pollution, reflect on the positive impact you brought to your school or community, marine species, and the environment!

REFLECT

1. How does plastic pollution adversely impact ocean health and marine species?



2. What are some alternatives to single-use plastic that are less detrimental to the environment?

3. How can we use citizen science to inform small-scale conservation initiatives?



Ocean Wise | Shoreline Cleanup



TAKE ACTION

Take part in an [Ocean Wise Shoreline Cleanup](#) with your classmates or within your community!

THE WHY

So far, Ocean Wise's shoreline cleanups have removed 13,915kg of litter from coastlines in Canada and the United States. Shoreline cleanups have prevented these plastics from entering marine ecosystems, reducing fatal impacts on thousands of species, such as the hawksbill sea turtle. Since plastics travel with ocean currents around the world, by organizing or participating in a shoreline cleanup, you are contributing to the removal of plastics in every ocean and shoreline around the world!

CLIMATE CHANGE
Humpback Whale

OCEAN POLLUTION
Killer Whale

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PLASTIC POLLUTION
Hawksbill Turtle

HABITAT LOSS
Sea Otter

Lesson 5

Habitat Loss - Sea Otter





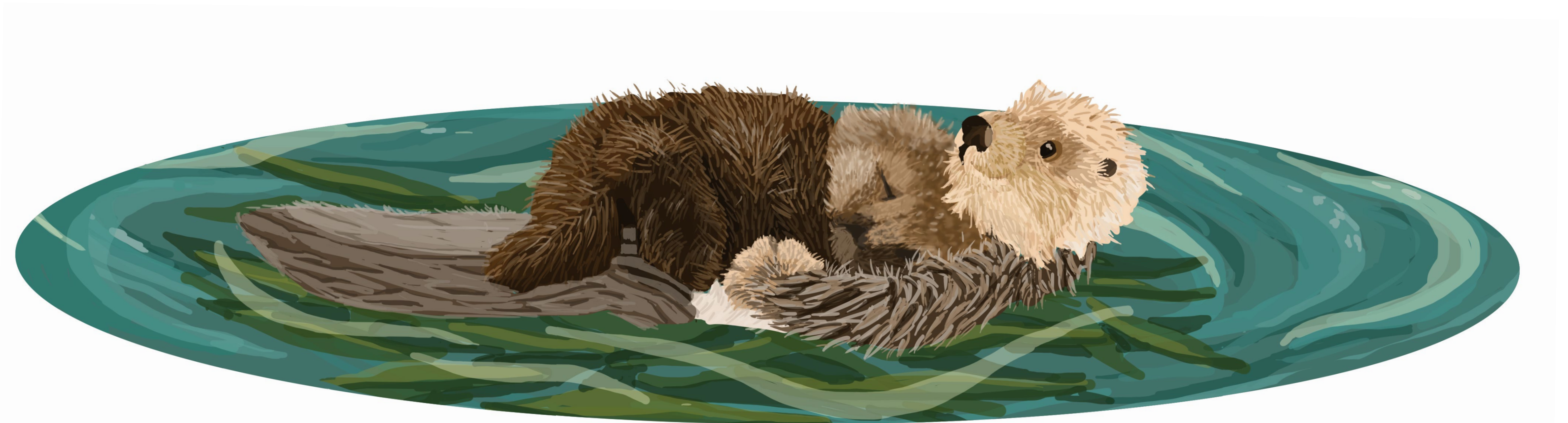
ACTIVITIES

1. What may have happened to help forests when sea otter populations were decimated in the 1700's? How could this have contributed to climate change?



2. a) Create a food web that highlights the role of humans and keystone species in an ecosystem. If you aren't sure what a keystone species is, read [*What Are Keystone Species by the National Marine Sanctuary Foundation*](#). When making your foodweb think about:

- Is your keystone species a predator, ecosystem engineer, mutualist, plant, or prey?
- Which species is your keystone species?
- What 'producer' did you include, and why?



CLIMATE CHANGE
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PLASTIC POLLUTION
Hawksbill Turtle

HABITAT LOSS
Sea Otter

b) What are some potential impacts of removing a distinct life form from this ecosystem? When answering this, you should think about:

- **Would certain species increase or decrease and why?**
- **How would your habitat/ecosystem change?**

3. Create a business plan for a kelp product by using the business plan guide below:

BUSINESS INTRODUCTION	Write an introduction title:	
	Name of company:	
	Names of owners:	
		<i>Come up with a fun and catchy company name!</i>

**BUSINESS
SUMMARY**

Write a paragraph about:

BUSINESS PLAN

This will be a brief outline of your business purpose and goals. What problem do you want this business to solve? What do you want from this business?

Highlight the importance of the company for society or the environment (or both!)

ORGANIZATIONAL LOGISTICS

Write a paragraph about:

BUSINESS OWNERSHIP

How will you (or your group) own and operate this business?

Focus on the logistical aspects of your company - how will you make your product? How will you get your product to customers?

MANAGEMENT APPROACH

Who will run the business? Who will you hire as future employees for this business?

[Large empty grey area for student response]

PERSONAL OBJECTIVES

What role would you like to play in this business? What are your future goals for your organization?

MARKETING
PLAN

Write a paragraph outlining:

THE PRODUCT

How will you sell this product? Why should people buy this product?

Keep in mind why the product is important and what its benefits are. Try to think of specific groups of people you would want to sell your product to.

CUSTOMERS

Who is the target audience for the product?

Large empty grey rectangular area for student response.

FINANCIAL
PLAN

Write a paragraph about:

How much money will you need to start this business? How will you raise these funds? How will you assure banks to invest in your business?

Think of what type of people would invest in your company. For example, if this will help the environment, the government may be interested in helping you \$\$\$!

Create a business image:

COMPANY LOGO

what will be your logo to represent this business?

**BUSINESS
IMAGE**

Get creative!



Read [*Return of Sea Otters to B.C. Coast*](#). Come up with a list of both pros and cons of reintroducing a species to an area where it had previously been eliminated as a conservation technique. Make sure to integrate [*Indigenous and non-Indigenous perspectives*](#). Read [*Indigenous People and Nature: A Tradition of Conservation by UNEP*](#).



THOUGHTBOOK

Now that you have a better understanding of how each species has a special role in an ecosystem, especially keystone species, you should also better understand the consequences if one of those species disappears. Reflect on the role of all species as it relates to the integrity of an ecosystem.

REFLECT

1. What are the potential effects, negative or positive, of removing a species from an ecosystem?

2. What ways can we protect critical ecosystem relationships?

3. How does ocean health depend on ecosystem relationships?



TAKE ACTION

Buy a sustainable kelp product!

THE WHY

Similar to your business ideas, there are many great products with kelp in them! Next time you go to the grocery store, take a look at the toothpaste, shampoo, salad dressings, dairy products, and/or frozen foods to see if they contain kelp. By buying sustainable kelp you are supporting and ensuring the planting of kelp. In other words, you are enabling greater carbon storage by kelp and better protection of sea otters and other ocean creatures which rely on kelp for a home! Kelp is also incredibly healthy and considered to be an excellent source of micronutrients, antioxidants, vitamins, and dietary fiber. So, buy a sustainable kelp product to make sure you and the ocean stay healthy!

WHAT IS OCEAN WISE?

Ocean Wise is a non-profit organization whose mission is to empower communities and individuals to take action to protect and restore our world's ocean.

Ocean Wise does this by tackling three critical ocean challenges - climate change, overfishing and plastic pollution – through six intersecting initiatives: seaforestation, changing arctic, plastics, fisheries and seafood, youth, and whales. Through our work we make a real and measurable difference to the health and well-being of the ocean and the people who depend on it. You can learn more about the actions you can take at ocean.org.

Looking for more Ocean education?

Ocean Wise's Education team offers in-person mobile education opportunities, online virtual programs, and more. Ocean Wise Professional Development Workshops are designed to train educators on discussing ocean health and literacy for students K-12. Visit ocean.org or email education@ocean.org to learn more.

Follow us on Social Media

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Have feedback? We would love to hear from you!

Please take 4 minutes to [rate us](#).

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