

STUDENT WORKBOOK



WAVE OF PLASTIC

Meaningful Watershed Educational Experience

LESSON FOUR IMPACTS ON AQUATIC ECOSYSTEMS

- How do we describe, quantify, and communicate about issues related to plastic waste?
- What causes disruptions to the stability of ecosystems?
- How can we use models to make predictions about the impacts of plastic pollution on ecosystems?
- How can personal choices and behaviors reduce the impacts of plastic pollution on ecosystems?

Student Name:

Unit Driving Question:

How do human choices regarding the consumption and disposal of plastics impact ecosystems and our communities and what actions can we take to minimize those impacts?

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Part 1- Introduction: Building Understanding

Objectives:

- We will obtain, evaluate, and communicate information about ecosystems as biological communities of interacting organisms and their physical environments.

DIRECTIONS

As you review the resources provided by your teacher, use the charts below to help collect, synthesize, organize and share information about ecosystems.

1. What is biodiversity?

Resources that I used	Notes

2. What does it mean for an ecosystem to be healthy and stable?

Resources that I used	Notes

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3. Why do scientists use an ecosystem's biodiversity as a measure of the health and stability of that ecosystem?

Resources that I used	Notes

4. In the box below, illustrate and label an example of a healthy and stable ecosystem.

5. What sorts of things can cause disruptions to the stability of ecosystems?

Resources that I used	Notes

Part 2- Investigation: Integrating Information & Ideas

Objectives:

- We will model and describe how plastic pollution in ecosystems affects organisms.

Activity: “You Are What You Eat”

DIRECTIONS

Follow your teacher’s directions to participate in the activity, “You Are What You Eat.” Then, answer the questions below.

Student Data Collection Sheet					
My condition: _____		My name: _____			
	Color 1:	Color 2:	Color 3:	Color 4:	Total:
Round 1					
Round 2					
Round 3					
Total Consumed (A)					
				Total Plastic (B)	
				Total Food (C)	

1. Compare your data to that of your group. What kind of effects from plastic pollution did your group members experience?

2. Which team member obtained the least amount of food? Why?

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3. How could the properties of plastic prevent an organism from getting the nutritional value it needs?

4. In the space below, illustrate an example of plastic pollution that is negatively impacting the organisms in an aquatic ecosystem. Be sure to label your illustration.



Part 3 – Application: Applying What We Learned Through Informed Action

Objectives:

- We will discuss how small changes in one part of a system might cause large changes in another part.
- We will apply what we've learned about per-capita consumption, plastic pollution, and the effects on ecosystems to develop a personal pledge for behavior change.

“I Make A Difference” Reducing Plastic Pollution Personal Pledge

DIRECTIONS

Develop a personal pledge that you plan to follow in order to help reduce harmful effects that plastic pollution has on ecosystems.

Things to keep in mind:

- Students can do many things to help make the world a better place. Applying what you've learned about an issue into positive and informed action is a perfect example!
- Personal pledges are commitments that a person makes to help them achieve a personal goal.
- Personal pledges might be focused on completing a certain action, such as taking reusable bags to the store, or it might focus on *not* doing a certain action, such as refusing to use plastic straws.
- Revisit your Personal Waste Inventory (from Lesson 1) and use other resources from the *Wave of Plastic* lessons to help you brainstorm ideas and get inspired!

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List ideas for your personal pledge:

- 1.
- 2.
- 3.

Which of your ideas would be something you could pledge to do/not do starting today?

Which of your ideas would require some setup before you could start your pledge?

Which action will you pledge to take?

When are you planning to take this action?

Is it a one-time event or a habit to change?

What do you hope will be the impact of your pledge?

What could be the potential impact if everyone at your school engaged in this action?

What could be the impact if everyone in your state engaged in this action?

What could be the impact if everyone in the country engaged in this action?

If this action is not taken, what would/could happen?

I, _____,

**pledge to protect ecosystems
from the harmful effects
of plastic pollution by**

My actions **matter** because

Trace your hand in the space below. If you'd like, you can decorate it to fit your pledge!

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Part 4- Assessment: Demonstrating Our Understanding

Objectives:

- Students describe how plastic pollution can cause changes to physical and biological components of an ecosystem.

DIRECTIONS

Use the Claim, Evidence, Reasoning model to respond to the question below.

Claim/Evidence/Reasoning Writing Rubric				
	0	1	2	3
Claim – statement or conclusion that answers the original question/problem.	Does not make a claim.	Makes an inaccurate claim.	Makes an accurate but incomplete claim.	Makes an accurate and complete claim.
Evidence – scientific data that supports the claim. The data needs to be appropriate and sufficient to support the claim.	Does not provide evidence.	Only provides inappropriate evidence (Evidence that does not support the claim.).	Provides appropriate, but insufficient evidence to support claim. May include some inappropriate evidence.	Provides appropriate and sufficient evidence to support claim.
Reasoning – justification that links the claim and evidence and includes appropriate and sufficient scientific principles to defend the claim and evidence.	Does not provide reasoning	Only provides reasoning that does not link evidence to claim.	Repeats evidence and links it to some scientific principles, but not completely.	Provides accurate and complete reasoning that links evidence to claim. Includes appropriate and sufficient scientific principles.

- ★ Construct an argument supported by evidence to describe how plastic pollution can cause changes to physical and biological components of an ecosystem.



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