

# LESSON 2

## In What Ways Do Humans Impact Marine Ecosystems?

### Lesson at a Glance

The concept of how humans impact healthy marine ecosystems is introduced in this lesson by building on knowledge from the previous lesson. Students identify two major ways in which human beings impact marine ecosystems and give examples. Students augment their drawings of a healthy marine ecosystem with human impacts.

### Lesson Duration

Two 45-minute periods

### Essential Question(s)

How do humans impact marine ecosystems?

### Related HCPSIII Benchmark(s):

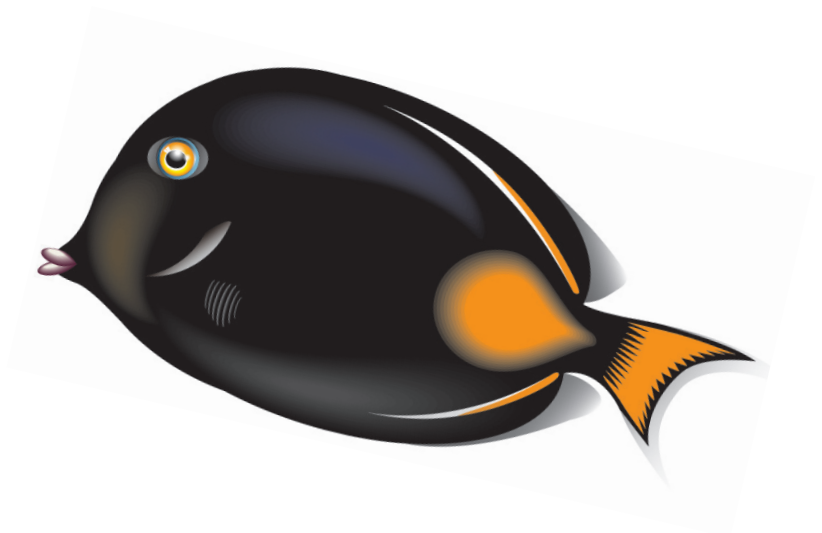
Science SC.4.3.2  
Describe how an organism's behavior is determined by its environment.

### Key Concepts

- Human impacts to marine habitats are divided into two major categories: habitat destruction and pollution.

### Instructional Objectives

- I can identify and describe the impact of human activities on marine ecosystems.



## Assessment Tools

### Benchmark Rubric:

<b>Topic</b>		<b>Interdependence</b>	
<b>Benchmark</b> <a href="#"><u>SC.4.3.2</u></a>		Describe how an organism's behavior is determined by its environment	
<b>Rubric</b>			
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Illustrate and explain in detail with examples how different organisms' behaviors are determined by their environment	Illustrate and explain with no examples how an organism's behavior is determined by its environment	Illustrate and give very little explanation of how an organism's behavior is influenced by its environment	Recognize that an organism's behavior is influenced by its environment through illustration only.

### Assessment/Evidence Pieces

<p><b>Lesson</b></p> <ul style="list-style-type: none"> <li>• Student illustration from Lesson #1 with modifications</li> <li>• Formative assessment:             <ul style="list-style-type: none"> <li>o Class discussion</li> </ul> </li> </ul> <p><b>Unit:</b></p> <ul style="list-style-type: none"> <li>• Student Self-reflection monitoring sheet (After Lesson 2 section)</li> </ul>
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### Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Student drawing from Lesson 1</li> <li>• Optional: sheet protector or other clear material</li> <li>• Student worksheet: <i>Human Impacts</i></li> <li>• Student worksheet: <i>Human Impact on Marine Ecosystems</i></li> </ul>

### Instructional Resources

Student Worksheet: *Human Impacts*

Assessment Tool: *Teacher Resource Checklist- In What Ways Do Humans Impact Marine Ecosystems?*

Teacher Recommended reading: *Oil Spill!* By Melvin Berger, HarperCollins Children's Books, 1994

## Lesson Plan

### Lesson Preparation

- Read the Science Background provided in the Unit's Overview.
- Preview and make copies of the Student Worksheet *Human Impacts*, one per student.
- Select paper and drawing tools (markers, colored pencils, or crayons).

### I. *Human Impacts*

- Review with students the effects of natural events on ecosystems that they studied in the previous lesson. Use this review to lead into how they will now be studying the effects of humans on ecosystems.
- Have students brainstorm ways that humans impact the marine ecosystem. You may choose to do this as individuals or in groups. They can write these ideas on scratch paper and tape them to a large sheet of paper.
- Hand out the Student Worksheet *Human Impacts*. Have students read the article and draw quick pictures in the illustration boxes in the margins that represent what each paragraph is describing.
- Tell students that the reading indicates two ways in which human beings impact marine ecosystems. Ask them to identify these ways, and write them on the Student Worksheet: *Human Impact Marine Ecosystems*. Then ask students to share examples of the two ways in which human beings impact marine ecosystems based on what they have seen, heard about, read in the newspaper, or have seen on news broadcasts. Have students record these examples on their worksheet. Examples may include pollution from fertilizer or pesticides running into the ocean, pollution of the ocean with garbage or sewage, over-fishing of certain species to the point of extinction, or loose dirt running into the ocean as a result of extensive logging and development.
- Allow students time to complete the worksheet and have class/group discussions on it. You may want to refer back to the students' ideas from step B above. *[If you will be doing this lesson in two class periods, this is a natural break to end period 1]*
- Using the class model of a monk seal environment created in the previous lesson as an example, have students include human impacts to the model. Students may draw trash, people taking pictures of the monk seal, buildings, roads, etc. There are several ways to update the class model. See some suggestions in Step G below.
- Now ask students to add human impacts to their drawing on marine ecosystems. Include pollution and destruction of marine habitats. Students should also discuss how these impacts are created. (e.g. from a party, a balloon flies away and ends up in the ocean.)

Here are several ideas on methods that can be used to update the lesson 1 drawings.

- 1) Students can create their drawings on some kind of transparent material, such as sheet protectors or transparencies to do as an overlay on the picture drawn in lesson one.
- 2) Or, students can make a collage out of magazine cuttings or newspaper clippings, drawings or pictures and paste them on the transparent material of your choice.
- 3) Or, students can use a different color pen or pencil to add these impacts onto their original drawings from lesson 1.

### II. *Check for Understanding*

How would human impacts affect the class organism, the monk seal? [Class picture may be updated with new information]

### Extended Activities

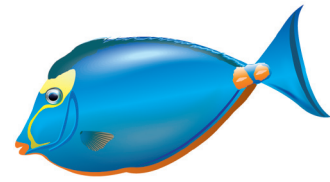
Drake University has an excellent unit on Oil Spills that could be used with your students:

[http://www.educ.drake.edu/sci\\_ed/elem\\_sci/environ/Oil%20Spills/default.htm](http://www.educ.drake.edu/sci_ed/elem_sci/environ/Oil%20Spills/default.htm)

View videos of Marine Debris and other human impact on the ocean:

<http://www.youtube.com/user/NOAEOceanMediaCenter#p/u/15/WqIOAIrl1IY>

# LESSON 2 Student Worksheet



## Human Impacts

### Illustration Boxes

There are a number of unfortunate ways in which human beings impact marine ecosystems. The major impacts include: 1) destruction of marine habitats, and 2) pollution.

Destruction of marine habitats often occurs along coastlines where human beings live. One quarter of the coral reefs have already been lost due to human activities. Run off from soil and deforestation (cutting down trees from forests) increases the amount of dirt in the water. This dirt enters the water and makes it cloudy. The animals that make up the coral reefs cannot live in cloudy water.

Pollution has a number of different sources. Fertilizers and pesticides from agriculture often run off into the oceans, which cause algal (related to algae) blooms and kill marine life. Sewage dumped into the ocean can also cause algal blooms. In the 1950s and 1970s, untreated sewage from the city was dumped into *Kāneʻohe Bay, Oʻahu*. This caused bubble algae to overgrow and harm corals. This then destroyed portions of coral reefs as well as reef fish.

Overfishing and harmful techniques used for fishing on coral reefs, such as explosives and poisons, are very damaging. Other threats to coral reefs include the mining of coral for construction purposes, the collection of coral and reef animals for home aquariums, and damage caused by recreational use of coral reefs, such as walking on the reef.

Other coastal areas threatened by human impacts include salt marshes and mangrove forests in estuarine environments. Estuaries are increasingly being dredged to make marinas and artificial harbors, or filled in for urban development.

Oil is one of the most widespread pollutants in the ocean. It is estimated that more than 600 million tons of oil enter our oceans each year. Almost 85 percent of the oil entering the ocean in North America comes from river runoff, coastal cities, fuel from small boats, and fuel dropped by planes in flight.


# LESSON 2 Human Impacts

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Identify two major impacts on marine ecosystems that are caused by humans.

A. \_\_\_\_\_  
\_\_\_\_\_

example(s) \_\_\_\_\_

B. \_\_\_\_\_

example(s) \_\_\_\_\_

2. List four examples of impacts on marine ecosystems and explain how the impact effects the organisms in the ecosystem on the lines provided. Identify each impact as pollution or habitat destruction by circling it.

A. Impact #1 \_\_\_\_\_ Pollution or Habitat Destruction

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. Impact #2 \_\_\_\_\_ Pollution or Habitat Destruction

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\_\_\_\_\_  
\_\_\_\_\_

C. Impact #3 \_\_\_\_\_ Pollution or Habitat Destruction

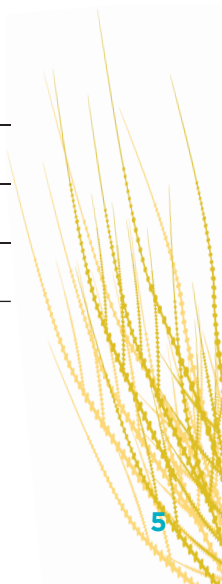
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D. Impact #4 \_\_\_\_\_ Pollution or Habitat Destruction

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\_\_\_\_\_  
\_\_\_\_\_

3. What are some ideas you have on how can we protect marine ecosystems?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# LESSON 2 Teacher Resource Checklist

## In What Ways Do Humans Impact Marine Ecosystems?

Name	<i>Identifies human impacts (worksheet)</i>	<i>Summarizes impact (worksheet)</i>	<i>Developed ideas for protecting the marine ecosystem (Q3)</i>
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