LESSON 5 Trash Hounds "Crime Scene Conclusions"

Lesson at a Glance

The fourth and fifth lessons are actual field trip experiences. In this lesson, students clean up a beach site, make observations about the quantity and type of marine debris, and infer from where the debris came. They then tell a *cradle-to-grave* story describing how the trash might have landed on the beach.

Lesson Duration

One 45-minute period on the beach

Essential Question(s)

What types of marine pollution did we identify?
What are the sources of this pollution?
How does it impact the organisms found there?
How has technology impacted this marine environment?

Key Concepts

- Trash left behind by beachgoers and marine debris that washes up onshore affects the beach environment.
- Observations about the presence of trash and kinds of trash can be made. Inferences about the source of the trash can also be made.

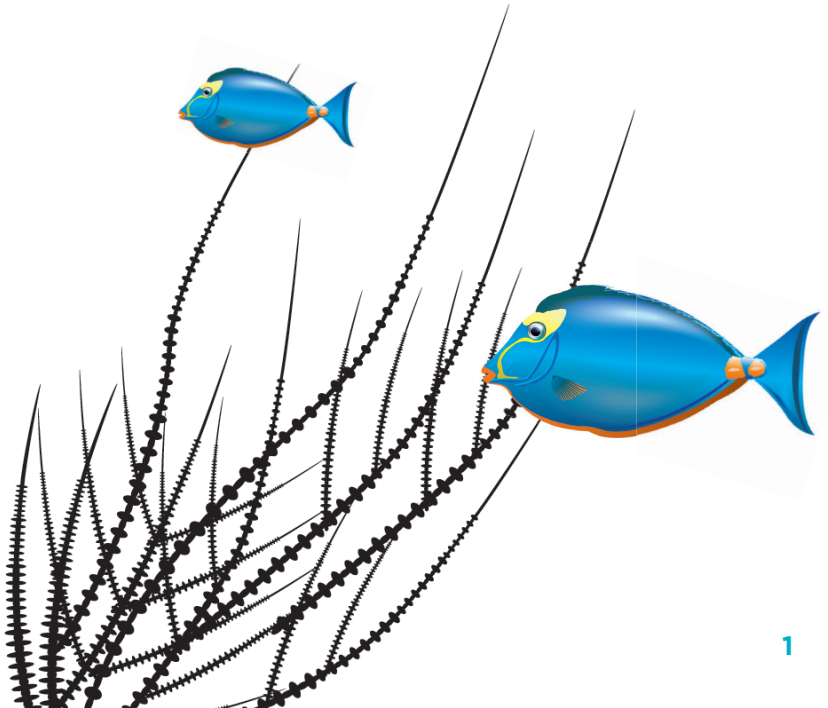
Related HCPSIII Benchmark(s):

Science: SC 4.1.2
Differentiate between an observation and an inference

Science: SC 4.2.1
Describe how the use of technology has influenced the economy, demography, and environment of Hawai'i.

Instructional Objectives

- I can observe and make inferences about trash on the beach and how it impacts the organisms that live there.
- I can describe how technology can negatively impact the environment of Hawai'i.



Assessment Tools

Benchmark Rubric:

Topic		Scientific Knowledge	
Benchmark SC.4.1.2		Differentiate between an observation and an inference	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain the difference between an observation and an inference and give examples	Differentiate between an observation and an inference	Provide examples of observations and inferences	Define an observation and an inference
Topic		Science, Technology, and Society	
Benchmark SC.4.2.1		Describe how the use of technology has influenced the economy, demography, and environment of Hawai‘i	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain how the use of technology has influenced the economy, demography, and environment of Hawai‘i and suggest ways to conserve the environment	Describe how the use of technology has influenced the economy, demography, and environment of Hawai‘i	Give examples of how the use of technology has influenced the economy, demography, and environment of Hawai‘i	Recognize that the use of technology has influenced the economy, demography, and environment of Hawai‘i

Assessment/Evidence Pieces

Lesson

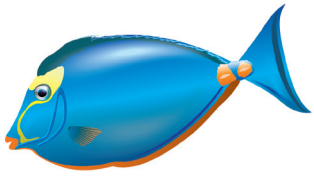
- *Student Worksheet Trash Hounds Observations*

Materials Needed

Teacher	Class	Group	Student
• Teacher Reading: *Trash Hounds*	• None	Student Worksheet: *Trash Hounds Observations* *Garden gloves* Appropriate beach attire (including hat, sunscreen)	• Student Worksheet: *Trash Hounds Observations* • Trash bags • Pencil

Instructional Resources

Teacher Reading: *Trash Hounds*
Student Worksheet: *Trash Hounds Observations*



Student Vocabulary Words

None

Lesson Plan

Lesson Preparation

- Read the Science Background provided in the Unit's Overview and Teacher Reading *Trash Hounds*.
- Ask students to bring garden gloves to class. Also ask chaperones to help by bringing additional spare gloves. Avoid using latex gloves because of potential allergies. Non-latex lab gloves (such as nitrile gloves), or cleaning gloves may also be used, but do not provide as much protection as sturdy garden gloves.

IMPORTANT: Refer to State document, HI DOE Standard Practices Document number 2250, Field Trips and Student Travel. Check with your principal or librarian for a copy or check with your Education Specialist for Environmental Studies in the Office of Curriculum, Instruction and Student Support at (808) 733-9141 x321. Look for the most recently revised guidelines.

I. *To the Beach*

A. Distribute to each group a pencil, one Student Worksheet: *Trash Hounds Observations*, trash bags, and garden gloves for all members of the group.

B. Tell students that they will be doing two sorts of scientific tasks: observing and inferring. They are going to observe the sort of trash that they find in their section of the beach, record the type of trash on the worksheet, and collect the trash in a bag. Then they will make an inference about the origin of the trash: Where did it come from? How did it get here? This is a good time to make a connection between trash and sand transportation. Point out that just as sand is transported from its source, such as a volcano, trash also moves from its source. In this way, sand and trash are similarly moved around from ecosystem to ecosystem.

C. Allow students 30–40 minutes to collect trash in their area.

SAFETY: DO NOT PICK UP GLASS OR SUSPICIOUS OBJECTS SUCH AS SYRINGES!

II. *Reflection "Talk Story"*

Assemble the students in a shaded area. Have them respond to the discussion questions on their worksheets. Then ask students to take turns telling a story to the other students in their group describing how Claude would be impacted by a particular piece of trash that was found on the beach. Circulate among the groups as students tell their stories.

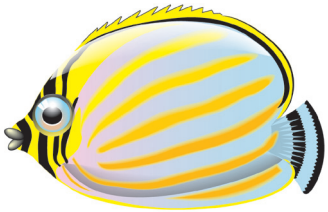
III. *Crime Scene Headquarters (Back in the classroom)*

A. Have groups chart their data. Display the data side by side to enable students to easily compare and contrast the data sets. Consider the following questions to guide the discussion.
   1) What patterns do you see in the data? Or what does the data tell you?
   2) How might trash or marine debris be affecting organisms in this environment?
   3) How does technology positively and negatively impact our environment?

B. Now have the students make their final journal entry based on the data, "Who's trying to kill Claude the Crab?" Based on the data collected, who do they think is trying to kill Claude the crab and why?

Extended Activities

Ask students to write down their oral stories about the history of the trash.

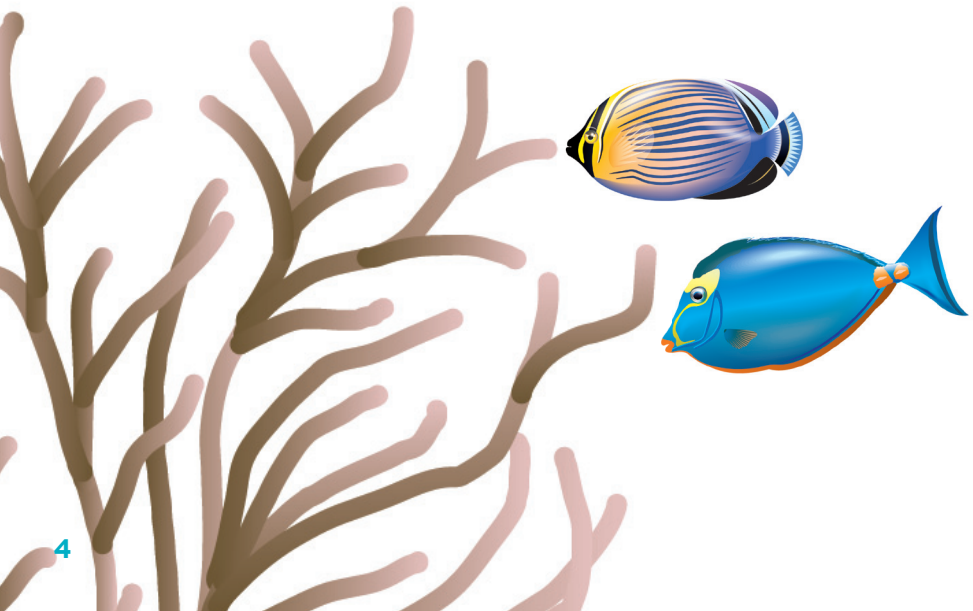


LESSON 5 Teacher Reading Trash Hounds

In this lesson, you are following up on Lesson 3, observations and inferences concerning pollution (both point source pollution and non-point source pollution), and extending these observations and inferences to real life work in the field. Questions such as, *What can you observe?* and *What can you infer?* are important to ask students frequently.

Students make observations every day of their lives in the classroom. They notice what their friends are wearing, what sort of mood their teachers are in, and what activities are being offered after school. Students also make inferences. They may notice that their friend wears the same shirt every day, possibly because he doesn't have enough money to buy a big wardrobe. They may observe that when their teacher is in a good mood, they have more silent sustained reading, and so may make an inference the next time their teacher is in a good mood that there will be more reading time.

Although students already make observations and inferences in daily life, you will need to point out the key difference. An observation is an observable fact: there is a milk gallon bottle on the beach. An inference is a hypothesis about the milk bottle: a family drank the milk, and then left the container on the beach, or the container washed up on the beach from a boat offshore.



LESSON 5 Trash Hounds Observations

Name: _____ **Date:** _____

Directions: Use tally marks for each object found.

Observations: What do you see?

Plastic			
Bags:		Sheeting:	
Food bags/wrappers		Longer than two feet	
Grocery		Two feet or shorter	
Other bags		Fishing line	
		Fishing lure, floats	
Bottles:		Fishing nets	
Beverage, soda		Light sticks	
Bleach, cleaner		pieces	
Milk/water jugs		six-pack holders	
Oil		Strapping bands	
Other		Straws	
Buckets		Toys	
Caps, lids			
Cigarette butts		Other plastic	
Diapers			

Foamed Plastic			
Buoys/floats		Packaging	
egg cartons		Pieces	
Fast food containers, cups		Plates	
Meat trays		Other	

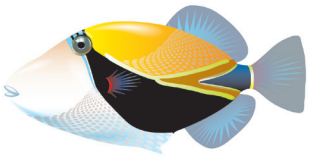
Glass			
Bottles/Jars:		Fluorescent light bulbs	
Beverages		Other light bulbs	
Food jars		Pieces	
Other jars/bottles		Other glass (specify)	

Rubber			
Balloons		Tires	
Gloves		Other rubber (specify)	

Metal			
Cans:		55 gallon drums:	
Aerosol		Rusty	
Beverage		New	
Food		Pieces	
Other		Wire	
Bottle caps		Other metal	

Paper			
Bags		Newspapers/Magazines	
Cardboard		Pieces	
Cartons		Plates	
Cups		Other paper (specify)	

Wood/Cloth			
Crates		Other wood pieces	
Pallets		Clothing/Cloth pieces	
Driftwood (mangrove limbs or other wood)			



Inferences: Where did the trash come from?

Items from foreign countries		Sea borne items	
Items from Hawai'i		Items left on the beach	
Nature (driftwood, bamboo, or other natural sources)		Other	

Discussion Questions:

Students need to realize that we produce more disposable items made of plastics and foam today than in the past. Technology has solved many of our problems, but along the way, it also created trash.

Students should answer questions like:

1. How does all this manmade trash affect the environment?

2. Why do we have all this non-point source pollution?

3. How can we decrease non-point source pollution?

4. How has technology impacted Claude the Crab's world?