

CULMINATING LESSON

Weather Safety Campaign

Lesson at a Glance

Students demonstrate their knowledge of waves and wave size, monitoring, and extreme weather by creating a safety booklet (or other presentation) that warns people of dangerous conditions in both pictures and words. They use both observations from their life experience and the information they have learned in the unit's lessons, and draw inferences.

Lesson Duration

Two 45-minute periods

Essential Question(s)

What weather and ocean (i.e., surf) conditions information are essential for public safety?

How do weather and surf predictions help the people of Hawai'i?

How does technology enable scientists to predict weather and ocean conditions?

Key Concepts

- Understanding of the various weather and ocean conditions that occur in Hawai'i are necessary for public safety
- Current and reliable weather and surf prediction enable people to live safely
- Technology enables scientists to predict weather and ocean conditions

Instructional Objectives

- I can describe safe conditions for people who live, work or play in or near the ocean.
- I can explain what technology is used to get current and reliable surf and weather information and why this information is important to the people of Hawai'i.

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.



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

**Note: depending on the emphasis put on the type of writing or how these booklet are presented some Language Arts benchmarks may be addressed.*

Assessment/Evidence Pieces

Lesson/Unit:

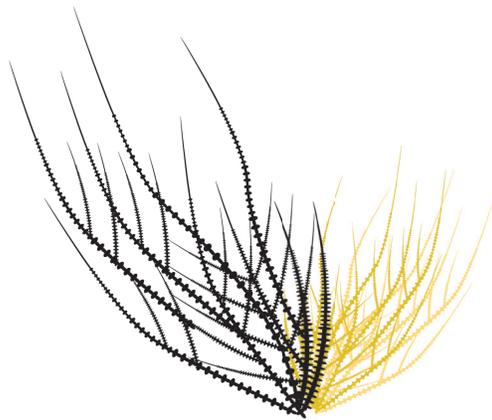
- Safety booklets created by the students

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Markers • Construction paper • Lined paper

Instructional Resources

Supplemental Resource: Weather and Wave Patterns Interactive Game (CD-ROM)



Student Vocabulary Words

a comprehensive list of vocabulary from previous lessons in this unit:

buoy: a floating device that is anchored to the ocean floor and which can gather and transmit data.

crest: the top of the wave.

forecast: to predict (a future condition or occurrence).

hurricane: a type of tropical cyclone in which the sustained surface wind is 74 miles per hour or more.

inference: a conclusion or explanation based on facts.

observation: the act of recognizing and noting or recording a fact or occurrence.

trough: the bottom of the wave.

tsunami: a series of ocean waves caused by Earthquakes, landslides, or volcanic activity.

wave height: the distance from trough to crest.

wave length: the distance between consecutive wave crest to wave crest.

wave: a transfer of energy, progressively from point to point in a medium (in this case water) with speed determined by the properties of the medium.

weather satellite: a device that orbits the Earth, equipped with instruments to measure and transmit data about weather features.

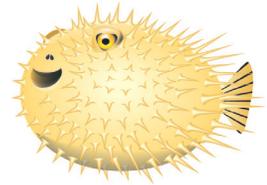
wind duration: how long in time the wind blows at a certain speed over a certain distance.

Lesson Plans

**Note: Other presentation methods may be used in lieu of a safety booklet. The teacher may choose to have all students create the same form of presentation or have each student choose the presentation style that suits their interests/audience.*

Some suggestions:

- Video
- Interactive poster
 - Either written or using a site such as glogster
- Storybook
- Song
- Etc.



Lesson Preparation

- **(Optional)** Teacher may want to create a sample safety booklet for students to see what the final product should look like.
- Review the key concepts of each lesson in order to prepare for review with students, including:
 - Predicting weather and ocean conditions using buoy and satellite data
 - Wave formation (wind speed, wind duration, and fetch)
 - Hurricanes and tsunamis: What are they and how do they affect ocean conditions?
 - Observations and inferences: What is the difference between them and how can they help those who live, work or play in or near the ocean?

I. Unit Assessment

A. Review briefly with students the following information:

- 1) Waves
- 2) Tsunamis and Hurricanes
- 3) Observations and inferences

(Suggestion: As the teacher completes the review, make a list of key points on the board from each lesson that will be useful during the creation of the safety booklets.)

- B. Explain to students that they will create a safety booklet to help the people of Hawai'i predict safe and dangerous ocean conditions. Tell the students that they should come up with a title and drawing for the cover of their booklet. Then create a checklist on the board of the items that students should include in their booklet:

Optional: Have students develop the checklist based on what they have learned in the unit.

1) Waves and wave size

- a. Illustrate and write about the factors that help to form waves.
- b. Illustrate and explain what kinds of waves are safe to surf and why.

2) Tsunamis and Hurricanes

(This is where students can insert observation and inferences into their work.)

- a. Illustrate and explain a tsunami. What observations and inferences can people make so that they know when to stay out of the water?
- b. Illustrate and explain hurricane waves. What observations and inferences can people make so that they know when to stay out of the water?

3) Predicting conditions with buoys and satellites

- a. Illustrate and explain what technology is used to predict weather and surf reports.
- b. Illustrate and explain why it is important to the people of Hawai'i to check these reports prior to heading off to the beach. (**NOTE:** Tell students that they should teach surfers and the general public in this booklet how to make observations about what they see, as well as draw inferences about what their observations mean. For example, a surfer might read a weather report about an approaching winter storm. What would that mean for surf conditions? (There will probably be high seas that are not *surfable* because of the winter storm. That is one inference. Another would be that big wave surfers will be excited about the large storm waves coming.)

- C. Go over with the class how to fold and assemble the booklet before they begin writing and drawing. (Suggestion: The teacher may want to have the booklets preassembled to save time. In addition, an example booklet may be put together so students can see what the final product should look like.)
- D. As the class works on their booklets, circulate to make sure students are capturing the necessary information into their booklets. Answer any questions students may have as they work.
- E. Once students complete the safety booklets, collect them. Tell the students that they are going to participate in a safety booklet share session. The teacher will take the completed booklets and pass them out to the class making sure not to give the students their own booklet. Allow about 1-2 minutes for students to review the new booklet. At the end of that time say "pass" and have the class pass the booklet they were reading to their neighbor. Do this a handful of times to give the class an opportunity to review several of their classmate's safety booklets. After the share session is over, display the safety booklets on a bulletin board in the classroom.

*Note: April is Tsunami Awareness Month, so students may want to share their presentations with members of the larger school community. Please see: <http://www.prh.noaa.gov/ptwc/> for more information.