

PELE SEARCHES FOR A HOME: WAVES!

Lesson 1

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Focus, Make Connections, and Reflect

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*Waves towering over the trees on Coconut Island, 1946
Courtesy of the Tsunami Museum*

Pele Searches for a Home: Waves!

Lesson 1

E Pūlama I ka Ho‘oilina (Cherish Your Heritage)



Waves are the most familiar feature of the ocean. Surrounded by the ocean, Hawai‘i is a natural setting for understanding waves.

Lesson Notes

I. Reflecting and Connecting

Concept/Theme

Sudden changes in the Earth’s crust, known as fast processes, such as earthquakes/ tsunamis reshape its surface.

Objectives

1. Students articulate what they know about tsunamis and generate at least one question about tsunamis.
2. Students write their statement to the prompt: *Why should we know about Tsunamis in Hawai‘i?*

Length

45 minutes

Materials

1. Elmo or white board.
2. Concept Organizer, Appendix: 1.1: Waves! Tsunami Concepts.
3. Sentence strips.
4. Felt-tipped pens.
5. Student journals.

Developing Background

Focus, Make Connections, and Reflect

Driving Question: *Why should we know about waves and tsunamis in Hawai‘i?*

I. Reflecting and Connecting

Hold a discussion on the driving question. The responses reflect student experiences and provide insights into the background information that students bring to the lesson.

1. Elicit from students what they know about tsunamis. Graphically represent their responses on a KWL, concept map, or T-Chart. A sample of a graphic organizer is included. (See Appendix 1.1: *Waves! Tsunami Concepts*)
2. In pairs, students generate what they know about tsunamis. Many may not have experienced tsunamis, but may have seen movies or news of tsunamis occurring elsewhere. Ask students where they saw information, photos, or videos of tsunamis.
3. Prompt students with sentence starters such as *“I know that tsunamis _____.”*
4. Teacher question prompts may include tsunami causes, locations, and effects on people, land, and property.
5. Record student responses on strips of paper for easier

arrangements of the sentences on the Tsunami Concept Map.

6. Group the “*I know*” statements into categories in the graphic organizer. (What a tsunami looks like, its causes, its effect or destruction of places, and its effect on people and safety.)
7. Review the graphic representation of what students know, then generate questions, “*I wonder _____,*” about tsunamis.
 - a. Write these questions below each of the related categories.
8. Discuss the driving question: *Why should we know about waves/tsunamis in Hawai‘i?*

Students Enter Reflections in Their Journals

1. *Why do you think we should know about waves/tsunamis in Hawai‘i?* Support each reason.

Assessment: 1) Observe what students know about tsunamis and questions they have about tsunamis during their graphic representation of what they know and wonder about. 2) Review student perspectives reflected in journals.

II. Defining the Culminating Project

Objective

1. *Students commit to one culminating product they will complete.*

Length

45 minutes

Materials

1. *Phone Books with Tsunami Inundation Information.*
2. *Computer and Internet access.*
3. *Resource people.*

II. Defining the Culminating Project, “Tsunamis/Waves Student Handbook”

No matter which island we live on, tsunamis have at one time shaped and reshaped parts of our islands. Students can create one of the following culminating projects:

1. Look at maps to determine whether the school, or where students live, is in an inundation area.
 - a. Look at phone books or online at:
[www.pdc.org/iweb/tsunami_zones.jsp]
2. If the school, or where students live, is in an inundation area, students can create a Student Tsunami Handbook or Brochure.
3. Work with the school’s resource people in planning what should be included in the handbook. Interview parents, teachers, librarian, staff, kūpuna, administrators, student council, and other students to determine useful information to include in the handbook. Examples of content to include:

- a. *What is a tsunami?*
 - b. Stories related to the tsunamis where students live.
 - c. Tsunami history of the area, landmarks, and stories.
 - d. Tsunami warnings.
 - e. Evacuation information—maps, procedures, evacuation centers, and supplies.
 - f. Other: As students complete the waves and tsunami tasks, they may think of other items to include.
4. There may be schools or students who do not live in a tsunami inundation area. These schools/students may not find a need to develop a Student Tsunami Handbook.
 5. Instead, they may prepare a Student Handbook on General Ocean Safety.
 6. Students may create a simulation that demonstrates the occurrence of a tsunami. Work with resource people to create the simulation (graphic or 3-D model). It might include:
 - a. Cause (earthquake, volcano, or landslide).
 - b. Seismic and wave motion.
 - c. Approaching wave.
 - d. Wave run-up.
 7. Other: As determined by the class and teacher.

Determine Information and Skills Needed to Complete the Project, Using the Concept Map. (See Appendix 1.1: *Waves!* Concept Map)

1. Identify areas that the students will need to focus on as they complete the class tasks.
2. Add other relevant questions “*I wonder about _____,*” that relate to and will help the students complete their culminating projects.

Assessment: By the end of the session, students should have committed to a culminating product they will complete by the end of the module.

III. Starting a Word Collection

Objectives

1. Students will contribute at least five words to the word collection.
2. Students will write a paragraph, accurately using words in a word category from the word collection.

Length

45 minutes

Materials

1. Trade books on waves/tsunamis.
2. *Waves!* text-set.
3. Appendix 1.2: *Waves! Word Collection*.
4. *Pele Searches for a Home* video and graphic novel.

Purpose

To create a word-rich learning environment where learners become motivated word learners.

III. Starting a Word Collection

1. Introduce the word collection sheets and procedures at any time during the *Waves!* lessons. (See Appendix 1.2: *Waves! Word Collection*)
2. Students will collect the words they encounter throughout the *Waves!* lessons. Categories may change, or may be added to the collection sheets.
3. Start by modeling and discussing the words added to the sheets using the *Pele Searches for a Home* video and graphic novel.
4. Using the graphic novel, *Pele Searches for a Home*, add words to the sheet. (Divide the graphic novel into four parts, allowing each group to read one part of the graphic novel.)
5. Share the reading and word collection words.

Assessment: Review student contributions to the word collection and accuracy of the use of words in their paragraphs.

Appendix 1.1: Waves! Tsunami Concepts

Tsunami Concepts

Concept Organizer

A concept organizer is a graphic representation of the concepts, and the relationship among the concepts, of a given topic. This helps students see the organization of the related concepts in a visual and hierarchical format.

Purpose

To visualize relationships among concepts of a given topic.

Materials

1. Selection of concepts from a current unit of study.
2. Tsunami Concept Map.
3. Elmo, chart, or white board to display the concepts generated.

Procedure

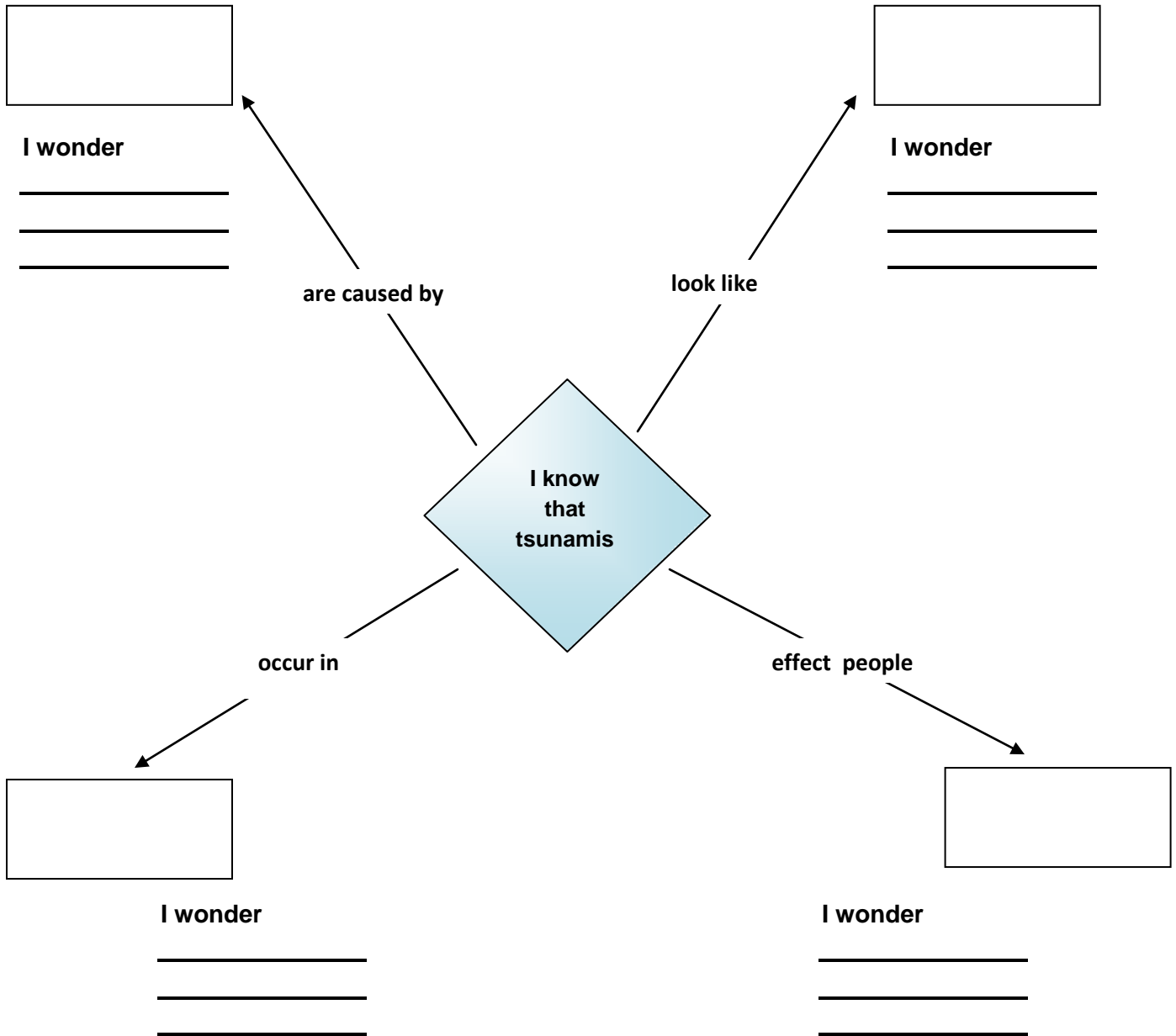
1. Introduce the purpose of a concept map.
 - a. A map is a graphic representation of concepts and related information.
 - b. A map can be used as a guide for students' reading.
 - c. A map can also be used to organize ideas for writing.
2. See the lesson above on generating sentence strips, "*I know that tsunamis _____.*"
3. Once all of the sentences are generated, group the "*I know,*" statements into categories in the graphic organizer Tsunami Concepts. (Include what tsunamis look like, their causes, their effects and destruction of places, their effect on people and safety.) Emphasize that the categories generated can be categorized in a number of ways. It is important that they base their categories on the attributes and characteristics they define.
4. Review the graphic representation of what students know, then generate, "*I wonder _____,*" questions about tsunamis.
 - a. Write these questions below each of the categories.

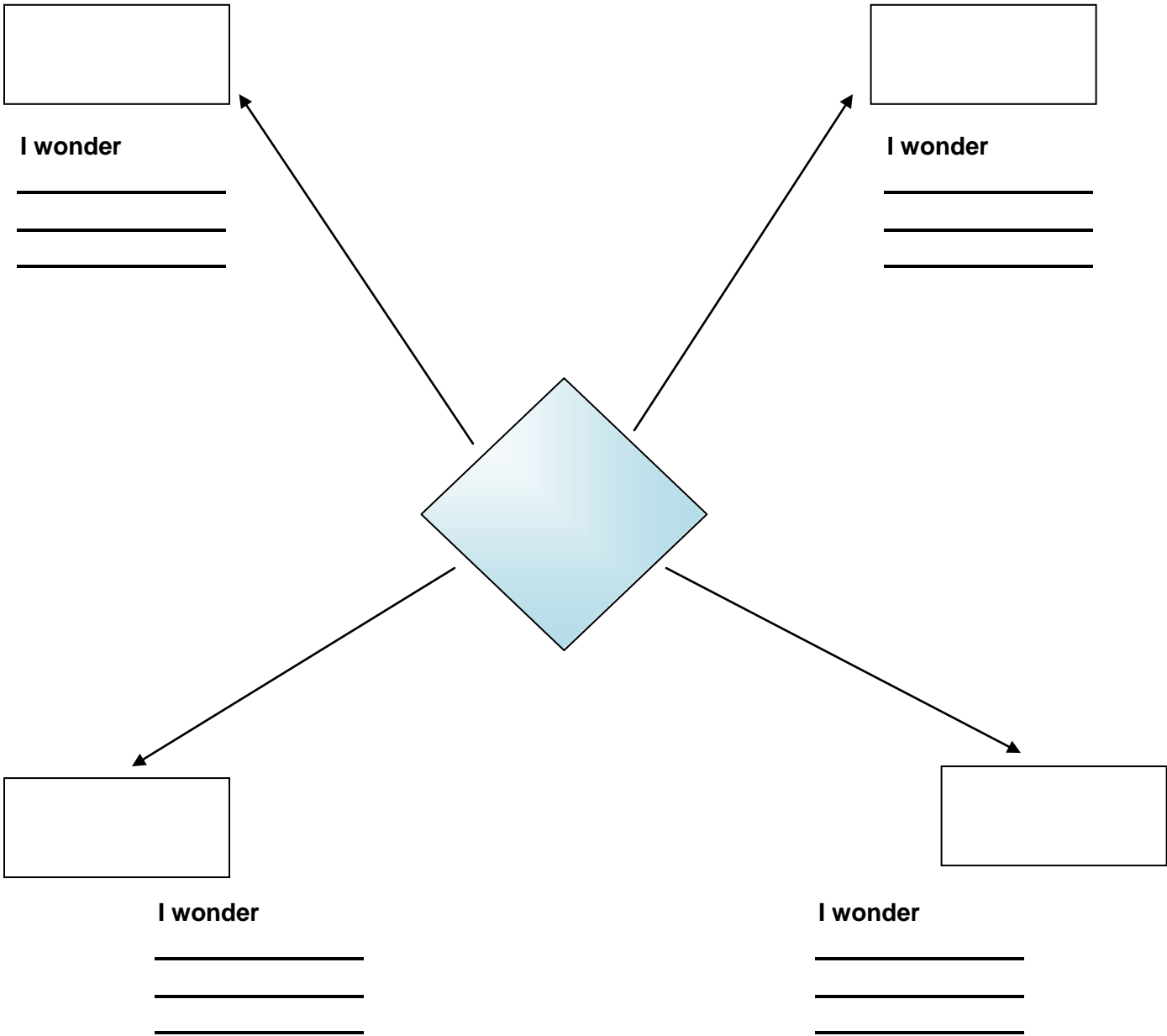
References

Macceca, Stephanie. (n.d.). *Reading strategies for science*. Huntington Beach, CA: Shell Education.

Tsunami Concepts

Add what you know about tsunamis on the concept map. Add more spokes for additional ideas. Extend concepts beyond the rectangle categories. Add “*I wonder questions*,” below each category.





Appendix 1.2: Waves! Word Collection

Word Collection

What is Word Collection?

Vocabulary can be enriched by providing rich language experiences in an environment where learners are “tuned in” (Blachowicz & Fisher, 2004) to learning new words in a way that positively affects their learning. Students use the Word Collection Sheet to collect words in class (e.g., from textbooks, trade books, magazines, and the Internet) or out of class (e.g., from signs, TV programs, and conversations).

Purpose

To create a word-rich learning environment where learners become motivated word learners.

Materials

1. Trade books.
2. Text-sets.

Procedure

1. As students read independently, or observe words used in and out of class activities, they fill the Word Collection Sheet with words that fit each category. (See the Sample Word Collection Sheet.)
 - a. The categories may correlate to a unit of study, or a series of events or observations. Sample categories might include the following:
 - Words that make me smile or laugh
 - Words that bring tears to my eyes
 - Forbidden words
 - Words that frighten me
 - Words of silence
 - Words of a powerful earthquake
 - Words that are powerful
 - Words that are devastating
2. The Word Collection Sheet can be modified to a Class Word Collection Sheet.
 - a. Students write their names on their additions to the Class Word Collection, so that the “owners” of the words are recognized.

Multiple Exposures to the Words

1. Hold “Word Conferences” with groups of students.
 - a. Students collecting words from the same sources such as a story, a particular event, or observation, meet in small groups or pairs.
 - b. Share the words on their sheets for selected categories.
 - c. Share why they selected the particular words.
 - d. Students may add to their collection.
2. Select a category and write a paragraph using the words on the list.

References

Blachowicz, C. & Fisher, P. J. (2004). *Teaching vocabulary in all classrooms*. Columbus, OH: Merrill Prentice Hall.

Sample Word Collection Sheet

As you read on your own, make observations, or read about an event, fill in this chart with words that fit each category.

Words that frighten me <i>furious</i> <i>dare</i> <i>siren</i>	Powerful Words <i>rival</i> <i>control</i> <i>passion</i>
Words of silence <i>troubled</i> <i>extinguished</i>	Words of the forces of nature <i>lightning</i> <i>earth shakes</i> <i>burn deep within earth</i> <i>tsunami</i> <i>rumbling ground</i>

Pele Searches for a Home
Video

Name: _____ Date: _____

Word Collection

As you read on your own, make observations, or read about an event, fill in this chart with words that fit each category.

The chart is a large rectangle divided into four equal quadrants by a vertical line and a horizontal line. A circle is centered at the intersection of these two lines, overlapping all four quadrants. The chart is currently empty, intended for students to write words that fit each category.

Name: _____ Date: _____

PELE SEARCHES FOR A HOME: WAVES!

Lesson 2

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Understanding Waves

Acquire, Process, Understand, and Conceptualize Knowledge

Driving Question: *What are waves and tsunamis?*

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Pele Searches for a Home: Waves!

Lesson 2

E Pūlama I ka Ho‘oilina (Cherish Your Heritage)



Tsunamis, unlike waves, currents, or tides, occur when the ocean is disturbed.

*Tsunami Waves
Courtesy of the Tsunami Museum*

Lesson Notes

I. Understanding Waves

Concept/Theme

Sudden changes in the Earth's crust, known as fast processes, such as volcanoes, earthquakes, and tsunamis reshape its surface.

Objectives

1. Students create a graphic of a wave with the accurate label parts: crest, trough, wave length, wave height, wave period.
2. Students are able to demonstrate wave motion.

Length

Approximately 3–45 minute sessions.

Materials

1. Computer with Internet access.
2. Aquarium or large rectangular container (plastic storage container)

Understanding of Waves

Acquire, Process, Understand, and Conceptualize Knowledge

Driving Question: *What are waves and tsunamis?*

I. Understanding Waves and Wave Motions

A tsunami is a wave. Students participate in a series of tasks to understand general information about the different kinds of waves.

Create Human Waves

1. As a class, read Page 5, “Ocean in Motion,” and “Waves”, in the text-set *Waves!*. Read Page 5, “Parts of a Wave”, and identify the parts of a wave.
2. Group students in sets of three.
 - a. Groups re-read the “Parts of a Wave” section and decide how they will demonstrate the parts of the wave by creating a human wave.
 - b. For example, students can form a line, standing at least 1 to 2 feet away from each other, and hold hands.
 - c. One person from the group identifies the following parts of the human wave:
Crest, trough, wave length, wave height, wave period.

of water.

3. Block of wood.
4. Waves! text-set.
5. Student journals.
6. Small light rubber ball or cork.

3. Once students are familiar with the parts of the wave, play an adapted version of “Simon Says.” The teacher or class leader calls out directions. Groups follow the directions, with the objective to be the last group to be disqualified. The directions include:
 - a. Increase your wave length.
 - b. Decrease your wave length.
 - c. Increase your wave period.
 - d. Decrease your wave period.
 - e. Increase your wave height.
 - f. Decrease your wave height.
4. Describe what happens if the students raise their hands. *How would it change the parts of the wave they created?*
5. Demonstrate what the waves look like when the wave lengths, heights, and periods change.
 - a. Use the online wave simulator at:
[www.nationalgeographic.com/volvooceanrace/interactives/waves/index.html]
Change the variables for making different wave types. Create bigger waves, or smaller waves. Create lots of waves, or only a few waves.
6. Observe wave motions at a beach during the day.
7. Summarize the information of the relationship among the wave lengths, heights, and periods. Either draw a class diagram of wave parts, or have students enter their drawings in their journals labeling the wave parts.

Assessment: Review accuracy of student wave diagrams.

Understanding Wave Motion in the Ocean

1. Demonstrate wave motion.
 - a. Fill an aquarium or rectangular plastic storage container with water.
 - b. Place a small, light rubber ball or cork in the water.
 - c. Use the block of wood to create waves in the aquarium.
2. Students observe the motion of the rubber ball or cork. Students share other examples that show the circular or bobbing motion in the ocean, such as a buoy, an idle boat, or their own experiences of floating in the water.

3. As a class, read Page 6 in the science text-set *Waves!* To validate their observations in the previous activity.
 - a. As a class or in small groups, watch the online simulations listed on Page 6.
 - b. Discuss the “Size of Waves,” on Page 6 in the science text-set *Waves!*

Assessment: Review authenticity of student wind-wave demonstration.

II. Understanding Wave Motion as they Break on Shore

Objective

Students identify the type of breakers at the beaches where they live.

Length

Approximately 2–45 minute sessions

Materials

1. *Waves!* science text-set.
2. Digital camera.
3. Pictures of different breaking waves.

II. Understanding Waves as They Break on Shore

1. Students share their experiences at the beach. Discuss what they do at the beach (surf, body surf, boogie board, paddle board, etc.).
 - a. Depending on their responses, describe the best type of waves to surf, body surf, etc. *Do they have names for the types of waves?*
 - b. *Which beaches are known for their sport?*
 - c. If the school is near a beach, describe the typical wave motion at the beach.
2. Read Pages 7–8 in the text-set *Waves!*

Summarize

1. Relate the descriptions of the waves on Pages 6–8 in *Waves!* to the beaches they are familiar with. Knowing the beaches where they frequent, *where would they find surging, plunging, and spilling waves?*
2. *Which waves would students surf, body surf, boogie board, paddle?* Students find out from their parents, friends, someone in the community who knows the beaches where they live, and share this information with the class.
3. Groups of students are given different pictures/photos of waves breaking at shore.
 - a. The groups categorize the pictures according to the type of breaking wave shown (surging, plunging, or spilling).
 - b. Students justify their placement of the wave images in the categories.
4. Students may validate their work by watching the simulations listed on Page 8 in the *Waves!* text-set.

Assessment: Review students' reasons for placing waves in the three categories (surging, plunging, or spilling). Note that the type of wave depends on the shape of the shore below the water.

III. Understanding Tsunamis

Concept/Theme

Sudden changes in the Earth's crust known as fast processes, such as waves and tsunamis, reshape its surface.

Objective

*Students write a summary of the causes of tsunamis using the words **tsunami, origin, swift, generate.***

Length

45 minutes

Materials

1. *Waves! text-set.*
2. *Appendix 2.1: Waves Causes of Tsunamis.*
3. *Computer and Internet access.*
4. *Large plastic storage container.*
5. *Thin wooden block or plastic to fit the width of the plastic storage.*
6. *Material to simulate the shoreline, property.*

III. Understanding Tsunamis

1. Read "What is a Tsunami" on Page 11 in the *Waves!* text-set.
 - a. Point out the meaning of the tsunami as described by the Japanese characters.
 - b. Point out the meaning of tsunami as described in Hawaiian.
2. In groups of three, complete the cause and effect text structure for causes of tsunamis. If this is the first experience with cause and effect, do explicit instruction on cause and effect text structure. (See Appendix 2.1: *Waves! Causes of Tsunamis*)
 - a. Read "What Generates a Tsunami," on Pages 11 and 12 in the *Waves!* text-set.
 - b. Note: Fill the top part of the fishbone. The bottom half will be completed as students read about Hawai'i-generated tsunamis.
3. As a class, review the causes of tsunamis including volcanoes, landslides, and earthquakes.
 - a. Watch the simulation of an earthquake at: [www.youtube.com/watch?v=4Xebwzb3dDE&feature=related]
 - b. Optional: There are many tsunami videos. Teachers should screen the video footage for age appropriateness and content.
4. Summarize the common effect of volcanoes, earthquakes, and landslides.
 - a. Elicit from students that all three cause disturbances to the ocean water that may result in tsunamis.
5. Demonstrate tsunami waves.
 - a. Use a large plastic container. (It must be large enough to see the effects—a large flat storage plastic container works.)

- b. Create a shore area with rocks, sand, and structures, if applicable.
- c. Add water to the container.
- d. Use a piece of board at the opposite end of the shore to simulate an earthquake. Lay the piece of wood or plastic piece (like a cutting board) on the bottom of the container.
- e. Raise the front end of the board toward the shore with a snap.
- f. Observe what happens.
- g. Students record their observations in their journals.

- 6. Students summarize their understanding of the causes of tsunamis in their journals.
 - a. Include the following words in their summaries: ***tsunami, origin, swift, generate***

Assessment: Review accuracy of students' summaries of the causes of tsunamis.

IV. Understanding Differences Between Wind Waves and Tsunami Waves

Concept/Theme

Sudden changes in the Earth's crust known as fast processes, such as tsunamis, reshape its surface.

Objective

In groups of two or three, complete a stage of wave motion by graphically representing the wave or tsunami stage. Include a written caption that describes the wave or tsunami stage.

Length

45 minutes

Materials

- 1. *Waves!* text-set.
- 2. *Appendix 2.2: Waves!* Waves Picture Gallery.
- 3. *11x17 Construction Paper*—white or oatmeal.
- 4. *Art supplies* (pencils, felt-tipped pens, crayons, water colors—depends on

IV. Understanding Differences Between Wind Waves and Tsunami Waves

- 1. Discuss the similarities of waves. Elicit from students that the parts of the wave and the types of waves depend on the shape of the land under the water near the shore.
- 2. *What are the differences? How do we know if it is a regular wave or a tsunami wave?*
- 3. On a large classroom chart, write the following headings:
 - a. Causes.
 - b. A Wave is Generated.
 - c. Wave Motion in the Open Ocean.
 - i. Speed.
 - ii. Energy of the wave.
 - iii. Wave speed.
 - iv. Wave length.
 - v. Wave height.
 - d. Wave Approaching Coastal Areas.
 - e. Impact or Effect of Wave (to be completed later).

(See Appendix 2.2: *Waves!* Waves Picture Gallery Sample.)

- 4. Assign students (may be completed in pairs or groups of three) to one of the stages of the Wave Gallery for either the wind generated wave or the tsunami wave.

class use of art materials).

5. Review the following pages in the *Waves!* text-set with the students:
 - a. Page 5 “What is a Wind Wave”
 - b. Page 6 “Wave in the Open Ocean”
 - c. Page 7 “Wave Approaching Coastal Areas”
 - d. Page 8 “Causes of a Tsunami”
 - e. Page 13 “Tsunami Wave in the Open Ocean”
 - f. Page 14 “Tsunami Wave Approaching Coastal Areas”
 - g. Page 15 “Typical Tsunami Waves”
6. Provide students with white 11x17 construction paper and art material (tailor to what the students are familiar with using).
7. Have students:
 - a. Re-read the part assigned to the group.
 - b. Sketch the stage of wave development.
 - c. Write a caption for the wave stage.
8. Students display their stage of wave development on the class’ Wave Gallery.
9. Summarize and have students share their stage of wave development.
10. Review the stages as a class and determine where in the stages of development a tsunami is responsible for shaping or reshaping the land.

Note: The last comparison of waves (impact or effect of a tsunami) will be completed after students read the stories of tsunami survivors.

Assessment: Review the accuracy of the graphic representation and descriptive caption for the wave stage represented on the chart.

V. Understanding the Impact of Waves and Tsunamis

Traditional practices, beliefs, values, and behaviors are elements of culture and contribute to the preservation of culture..

V. Understanding the Impact of Wind Waves and Tsunamis

1. The stories and descriptions found on Pages 1–4 in the text-set, *Waves!*, have been passed down since before people settled in Hawai’i.
2. The stories and descriptions found on Pages 17–25 in *Waves!* are the stories of tsunami survivors in present day Hawai’i.

Objectives

1. Students articulate the similarities and differences between traditional stories, and current stories about tsunamis.
2. Students express in writing three things they learned about tsunamis from the stories they heard or read.

Length

45 minutes

Materials

1. Appendix 2.2: *Waves! Waves Gallery*.
2. Appendix 2.3: *Waves! Descriptive Words*.
3. Computer and Internet access.
4. *Waves!* text-set.

3. *How are the stories alike? What can we learn from these accounts about tsunamis?*
4. As a class, read Pages 1 and 2 from *Waves!* together. The stories can be read aloud using the popcorn reading method.
5. On a chart, record selected descriptive words that describe tsunamis. (See Appendix 2.3: *Waves! Waves/Tsunami Descriptive Words*)
6. Conduct a class discussion on the “lessons from stories told.” Summarize ideas about the stories on the chart.
 - a. *What do we learn about tsunamis from these stories?* Elicit from students the following facts about tsunamis:
 - They cannot be predicted.
 - They can be devastating.
 - There are warning systems.
 - There is very little time to get to safety if a wave is generated in Hawai‘i.
 - Know where inundation areas are.
 - No part of the island is safe—tsunamis wrap around islands.
 - People can’t out-run a tsunami.
7. Have students complete the *Waves/Tsunami Waves Gallery* on the impact of waves/tsunamis.
8. Have student groups that worked on the fishbone cause and effect of tsunamis complete the chart, including information about tsunamis generated in Hawai‘i (Pages 23–26 in *Waves!*). Use the bottom section of the fishbone.
 - a. *What are some of the impacts that Hawai‘i-generated tsunamis have on the places where you live?*
9. Students interview parents and others who may have experienced a tsunami. If not, select one of the stories from the text that show the impact of a tsunami. Find out:
 - a. *Where did the tsunami occur?*
 - b. *Where did the tsunami originate from?*
10. In their journals, have students write about the story they read and three things they learned about tsunamis.

VI. Developing A Word Learning Strategy

Objectives

1. Students are able to show word relationships of selected target words.
2. Students accurately show a schema for understanding words by providing a visual representation of related ideas.

Length

45 minutes

Materials

1. *Pele Searches for a Home graphic novel.*
2. *Appendix 2.4: Waves! Frayer Method.*

Assessment: 1) Observe students' contributions during discussion. Were students able to articulate similarities and differences between traditional and current stories about tsunamis? 2) Review students' journal entry reflecting what they learned about tsunamis from stories that were told.

VI. Developing a Word Learning Strategy: Tsunami Vocabulary

Appendix 2.4: *Waves!* Frayer Method

1. Develop *Waves!* vocabulary using the Frayer Method of vocabulary development.
2. The strategy is intensive; however, it provides exposure to the words in different contexts.
3. Model the strategy with the word *tsunami*, then assign students with the target words listed in the *Waves!* text-set.
4. Have students share their words with the class.
5. Teachers may provide students with any of the vocabulary practice sheets as a formative assessment of their understanding of the target words.

Assessment: Review accuracy of students' visual representation of related ideas of the selected target words.

Appendix 2.1: *Waves!* Tsunami Cause and Effect

Cause and Effect *Explicit Instruction*

What is a Text Structure?

Text structures are the way authors organize the information in text. The most common informational text structures include the following: compare/contrast, problem/solution, cause/effect, sequence, and description. Most informational texts contain a variety of integrated types of text structures.

Cause/Effect

Cause and effect text structure is used frequently in social studies and science text. Cause and effect is a text pattern that explains why or how something happened. It is also a dominant pattern used in social studies text books. “McCormick (2003) has suggested that this structure is difficult because of the complex comprehension skills (i.e., making inferences, judging sequence, and making predictions) involved in the interpretation of causes and effects” (Williams, p. 112). See Table 1 found below for additional information about the text structure of cause and effect.

Signal Words

The way a reader can understand the text structure or the organization pattern of a text is through the use of signal words. Signal words are specific words that are clues or sign posts to the structure of the text. Each type of informational text has signal words that are unique to that structure. Signal words are clues to the reader that the author has organized the text in a specific way. In higher level texts, the signal words are often inferred rather than explicitly stated. See Table 1 for signal words that are commonly used with the text structure of cause and effect.

Graphic Organizer

A graphic organizer is “A visual representation of information that shows the relationship between ideas or their organization” (Fountas/Pinnell, p. 490, 2006). Graphic organizers can be used to outline the text structure or pattern. They keep students actively engaged in the reading, and they help students see the structure and remember the important points. Graphic organizers keep students actively involved, help them to organize information, and help them see how major ideas are related. They help students to remember key ideas that they read. See Table 2 for examples of graphic organizers for the compare/contrast and the cause/effect text structures.

Table 1: Text Structure of Cause/Effect

Text Structures and Signal Words

Text Structure	Description of Structure	Signal Words: Words	Sample Graphic Organizers
<p>Cause/Effect</p>	<p>Texts that follow this structure tell what happened and why it happened.</p> <p>Example: <i>Why do stars twinkle?</i> “In the center of the star, the gas hydrogen is changed into another gas called helium. Consequently as the gas changes, the star gets very hot and gives off the brilliant light that is seen. When the light from the stars travels through layers of gas that surround Earth, they appear to twinkle.” (From <i>Our Earth, the Sun, and the Stars</i>, Pages 11–12)</p>	<p>Because, so that, thus, unless, therefore, since, in order to, as a result of, this led to, then, reasons for, then...so, for this reason, consequently, an explanation for, accordingly, begins with, effects of, if...then, is caused by, may be due to, so that, steps involved, thereby, thus, when...then.</p>	

Written by Susan Hanson, Reading Specialist at PREL (Pacific Resources for Education and Learning)

References

Dreher, M. J., Gray, J. L. (October, 2009). Compare, contrast, comprehend: Using compare-contrast text structures with ELLs in K–3 classrooms. *The Reading Teacher*, 63(2),132–141.

Fisher, D., Frey, N., & Lapp, D. (2009). *In a reading state of mind: Brain research, teacher modeling, and comprehension instruction*. Newark, DE: International Reading Association.

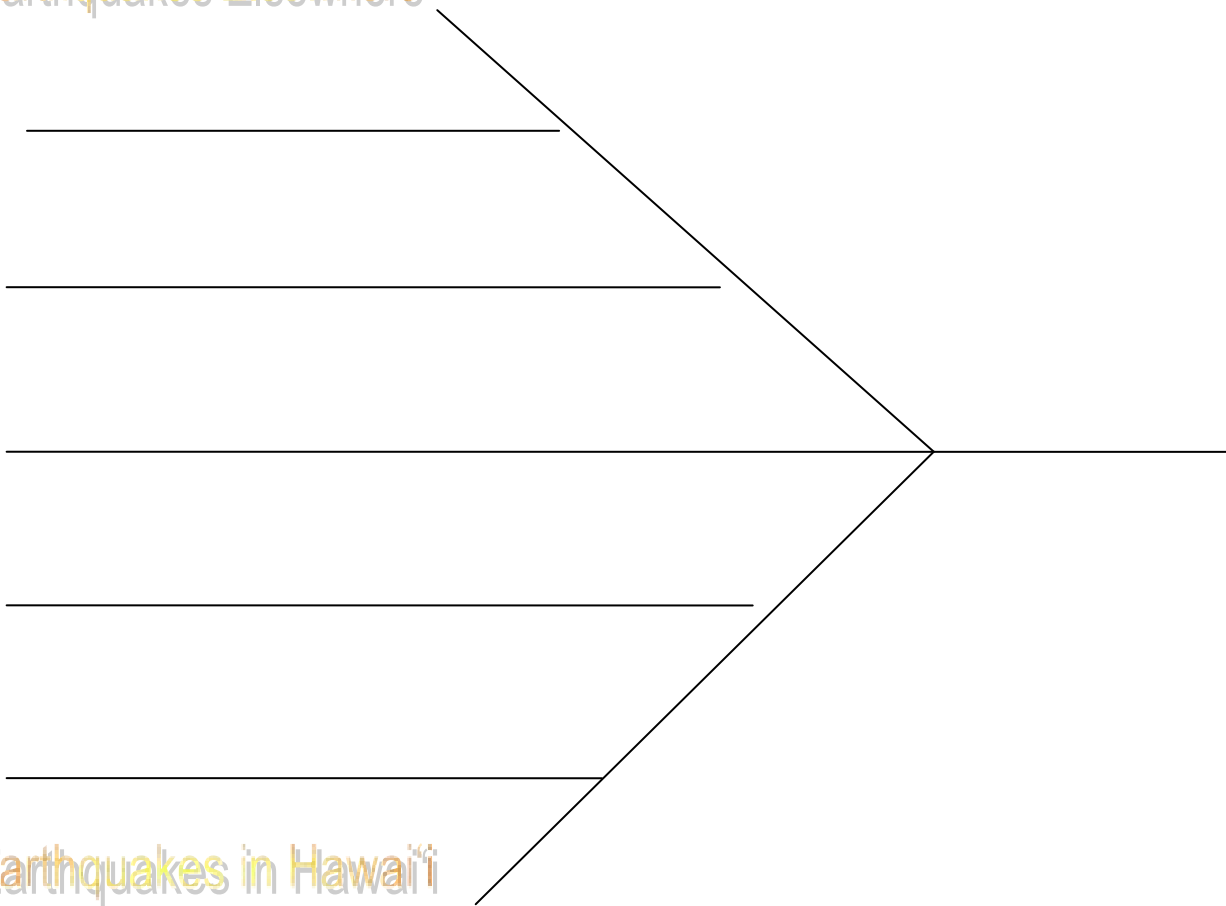
Fountas, I. C., & Pinnell, G. S. (2006) *Teaching for comprehension and fluency: Thinking, talking, and writing about reading, K–8*. Portsmouth, NH: Heinemann.

Williams, J. P., Nubla-Kung, A. M., Pollini, S., & Stafford, K. B. (March/April, 2007) Teaching cause-effect text structure through social studies content to at-risk second graders. *Journal of Learning Disabilities*, 40(2), 111–120.

Appendix 2.1: Waves! Tsunami Cause and Effect

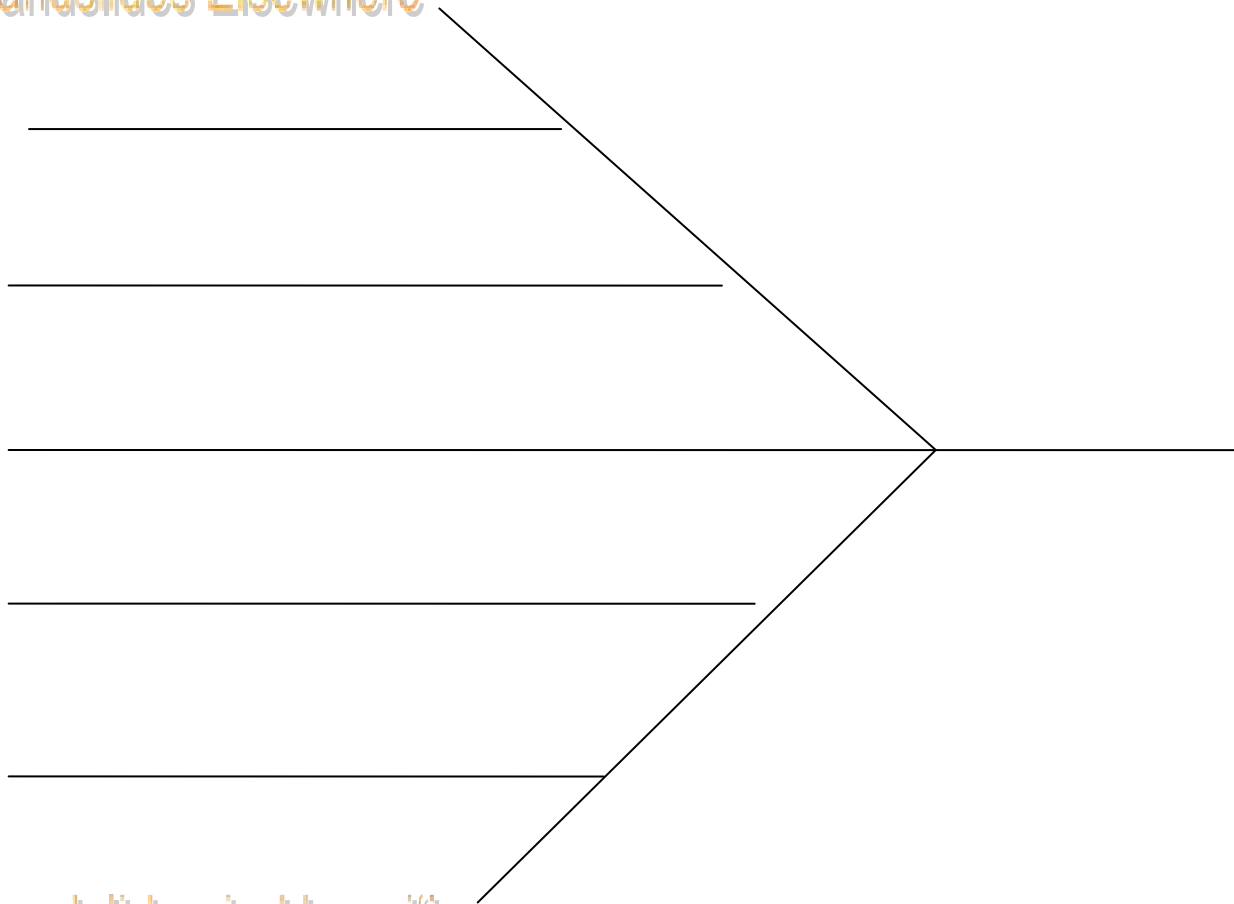
Cause and Effect

Earthquakes Elsewhere



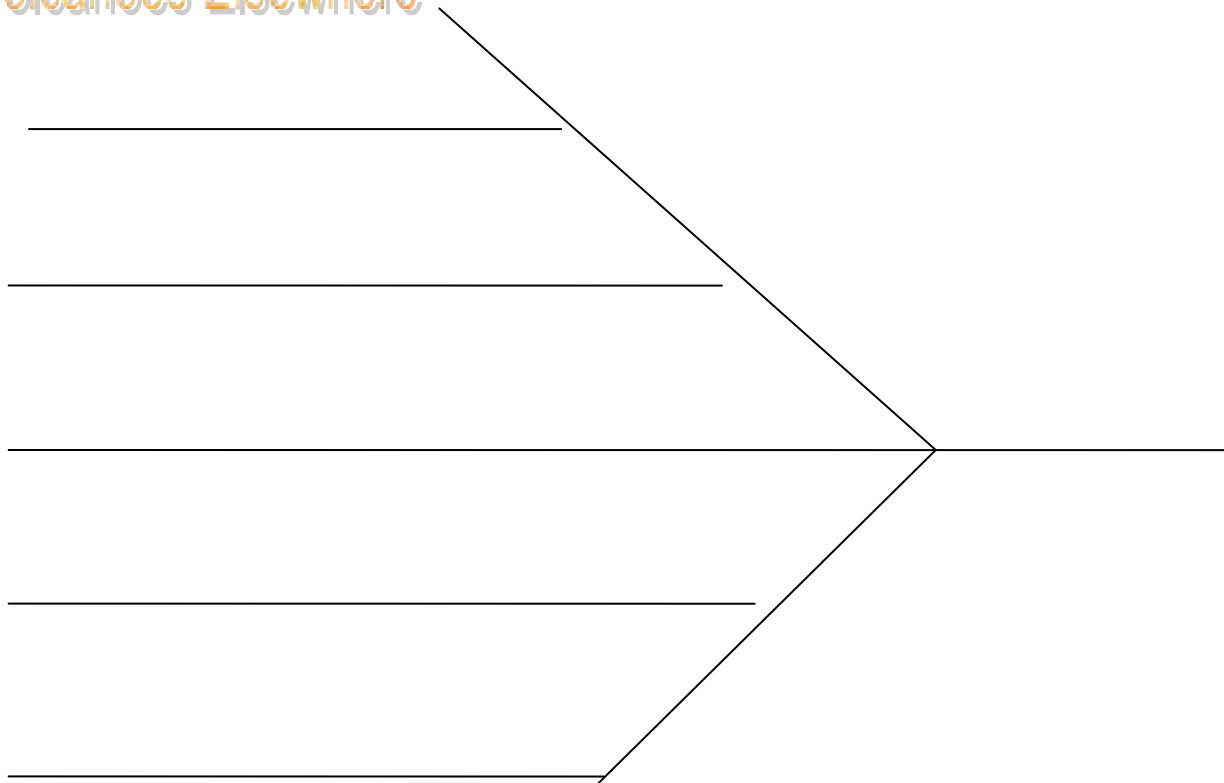
Earthquakes in Hawai'i

Landslides Elsewhere



Landslides in Hawai'i

Volcanoes Elsewhere



Volcanoes In Hawai'i

Cause and Effect Checklist

- _____ Identify cause and effect statements.
- _____ Identify characteristics of cause and effect relationships.
- _____ Identify and use appropriate signal words for cause and effect relationships.
- _____ Use visual representation to show how cause and effect relationships are organized and presented.
- _____ Construct cause and effect written statements.
- _____ Apply the use of cause and effect text structure to explain a natural phenomenon.

Appendix 2.2: Waves! Wave Gallery (Sample)

Wave Gallery

Cause of a Wave	A Wave is Generated
Wind Wave	Wind Wave
Caption:	Caption:

Tsunami Wave	Tsunami Wave
Caption:	Caption:

Wave Motion in Open Ocean	Wave Approaching Coastal Area
Wind Wave	Wind Wave
Caption:	Caption:

Tsunami Wave	Tsunami Wave
Caption:	Caption:

Impact of Wave	Summary
Wind Wave	Wind Wave
Caption:	Caption:

Tsunami Wave	Tsunami Wave
Caption:	Caption:

Appendix 2.3: Waves! Tsunami Descriptive Words

Understanding Tsunamis Through Stories

Record words and phrases that help us understand tsunamis from stories of long ago and present day stories.

Stories Before People Arrived in Hawai'i (Pages 1–4 in <i>Waves!</i>)	Present Day Stories (Pages 17–25 in <i>Waves!</i>)
<i>Clattering, fluttering, rumbling, swaying earth</i>	<i>Waves pounded Haena and swept 500 yards inland</i>
<i>Ocean seethes</i>	<i>Ocean went dry, as if somebody pulled a plug and sucked the water away</i>
<i>Climbs up to the mountains</i>	<i>Fish flapping in the wet sand</i>
<i>Silencing the fresh water</i>	
<i>Rising up to the rafters of the house</i>	

Appendix 2.4: Waves! Frayer Method

Frayer Method

The Frayer Method is a powerful vocabulary development strategy that helps students to acquire a deeper understanding of word meanings by requiring them to: (a) analyze a word's attributes (characteristics) and (b) synthesize and apply their knowledge to distinguish examples and nonexamples of the word.

The following procedure is an adaptation of the Frayer Method developed by Frayer, Frederick, and Klausmeier (1969). It includes the use of a graphic organizer which is referred to as the Frayer Model. The procedure also scaffolds the learning process by gradually releasing the responsibility of learning to students: “*I do*” (model), “*We do*” (guided practice), and “*You do*” (independent practice).

Purpose

To acquire a deeper understanding of a new concept and to distinguish that concept from others.

Materials

Blank copy of Frayer Model graphic organizer.

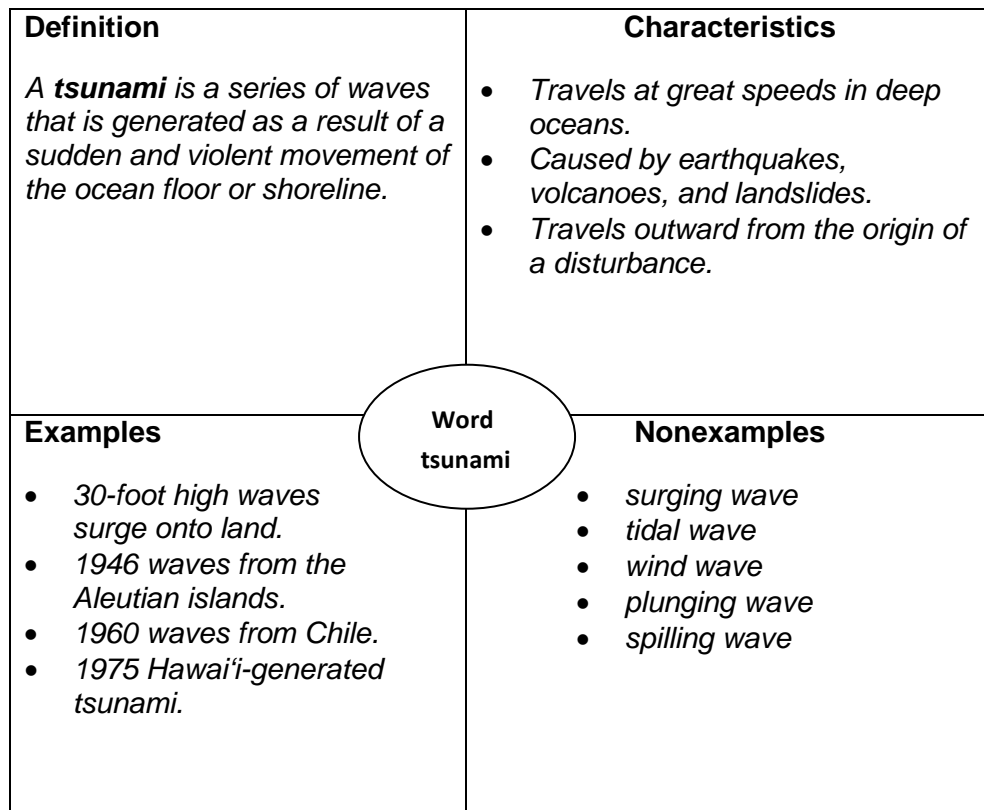
Procedure

1. Model the process with the entire class. Create a large chart of the Frayer Model graphic organizer. Present the word *tsunami* and write it in the center oval.
2. Define the new word or concept by identifying all of its discriminating features or characteristics. If possible, it is helpful to show a picture that represents the concept.
A tsunami is a series of waves that is generated as a result of a sudden and violent movement of the ocean floor or shoreline.
3. Discuss the concept further by contrasting the new concept with a similar, but different, concept with which it might be confused.
A tsunami is different from waves or tides. Waves are caused by wind, and tides are caused by the gravitational pull of the moon and sun. Tsunamis may be caused by earthquakes, landslides, or volcanic eruptions. When this happens, the displaced water travels as waves from where the disturbance occurred to all directions in the ocean.
4. Give examples of the concept and explain why they are examples.
 - a. The tsunamis of 1946 and 1960.
 - b. Hawai'i-generated tsunamis in 1960 and 1975.

5. Give nonexamples of the concept and explain why they are nonexamples.
 - a. Wind-generated wave.
 - b. Surging waves.
 - c. Plunging waves.
 - d. Spilling waves.
6. Present students with more examples and nonexamples, and ask them to distinguish between the two.
7. Once students understand the process, select a new concept for them to use with their own Frayer Model graphic organizer.
8. Form small groups and provide guided practice with the concept. Students may use textbooks, pictures, and other resources to define the concept and to identify discriminating attributes of the word. Complete the graphic organizer together with students' input, and include Step 3 as part of the discussion.
9. Provide independent work with other words from the target vocabulary words, such as:

intensity
surge
disaster
hazard
origin
potential
threat
swift

Frayer Model



References

Frayer, D. A., Frederick, W. D., & Klausmeier, H. J. (1969). *A schema for testing the level of concept mastery* [Working paper No. 16]. Madison, WI: Wisconsin Research and Development Center for Cognitive Learning.

Frayer Model

Definition	Characteristics
Examples	Nonexamples

Word

The diagram is a square divided into four quadrants by a vertical and a horizontal line. In the center, where the lines intersect, is a circle containing the word 'Word'. The top-left quadrant is labeled 'Definition', the top-right is 'Characteristics', the bottom-left is 'Examples', and the bottom-right is 'Nonexamples'.

Name: _____ Date: _____

PELE SEARCHES FOR A HOME: WAVES!

Lesson 3

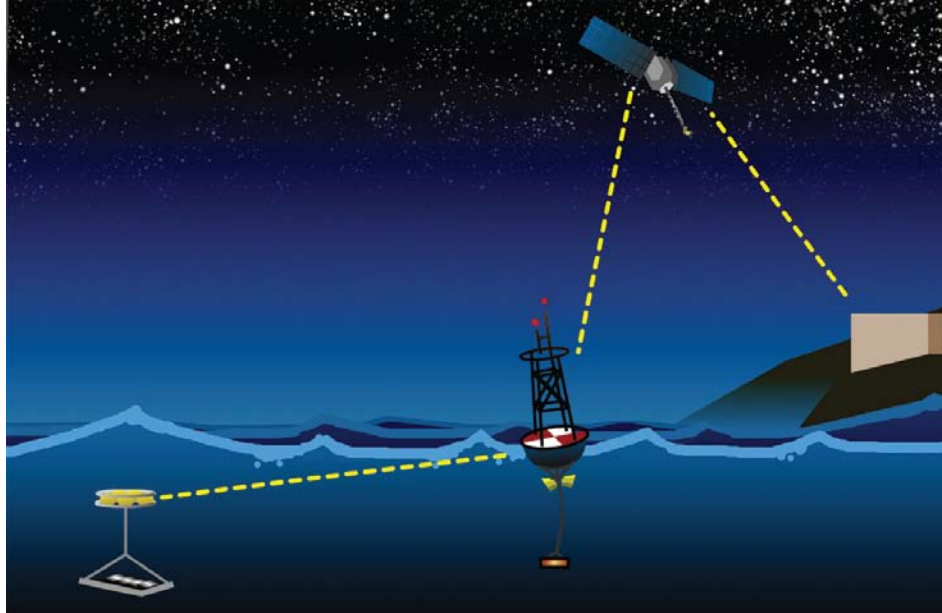
Table of Contents

Extending Understanding of Waves

Practice, Clarify, Internalize, and Demonstrate

Driving Question: *How do waves and tsunamis shape and reshape where we live?*

Learning Engagements	Pages
I. Refining the “Waves/Tsunamis Student Handbook,” Project (See Appendix 3.1: <i>Waves! Waves/Tsunami Student Handbook</i>)	36 39
III. Researching and developing the culminating project, “Waves/Tsunamis Student Handbook” (See Appendix 3.2: <i>Waves! Student Handbook Checklist</i>)	37 41
IV. Developing a vocabulary strategy (See Appendix 3.3: <i>Waves! Prefixes</i>)	38 42



Warning System – Bryson Luke

Pele Searches for a Home: Waves!

Lesson 3

E Pūlama I ka Ho‘oilina (Cherish Your Heritage)

Hawai‘i is surrounded by the ocean. Even if our homes, work, or schools are not located near the shoreline, everyone has some connection with the ocean.



Lesson Notes

I. Refining the “Waves/Tsunamis Student Handbook” Project

Concept/Theme

Sudden changes in the Earth’s crust, known as fast processes, reshape its surface over time (e.g., volcanic eruptions, earthquakes, floods, and tsunamis).

Objectives

1. Student groups update their plan of action that will help them complete the culminating project.
2. Students research warning and safety systems specific for the place where they live.

Length

45 minutes

Materials

1. Waves! science text-set.
2. Digital cameras.
3. Computer and Internet access.
4. People resources from the community (kūpuna, historical groups, scientists).
5. Appendix 3.1: Waves! Waves/Tsunamis Student Handbook

Extending Understanding of Waves

Practice, Clarify, Internalize, and Demonstrate

Driving Question: *How do waves/tsunamis shape and reshape where I live?*

I. Refining the “Waves/Tsunamis Student Handbook” Project

Pages 7–10 and 27–30 in the *Waves!* text-set are meant for students to explore waves and tsunami awareness and safety systems where they live. The pages include general information about waves and the tsunami warning systems in place. The intent is for classes to use the information to explore the specific precautions for where they live. (In Lesson 1, students explored a potential culminating project about tsunamis. This lesson focuses on warning systems and precautions that can be applied to their culminating project.)

1. Revisit the culminating project.
(See Appendix 3.1: *Waves!* Waves/Tsunamis Student Handbook)
2. Review the material located on Pages 7–10 and 27–30 for the island where the class is located.
3. With the students, outline the procedure for completing the task.
 - a. Determine what students already know.
 - b. Determine what questions students need to further research and what resources they need to answer

their questions.

- c. Outline an action plan based on the culminating project information. (See Appendix 3.1: *Waves!* Student Handbook.)

II. Researching and Developing the Culminating “Waves/Tsunamis Student Handbook” Project

1. See the “Resource and References” section in the science text-set, *Waves!*
2. Contact community resources (kūpuna, civil defense, scientists, city and county life guards, tsunami warning centers, etc.).
3. Do Internet searches for more information about the impact of waves/tsunamis where students live.
4. Students’ research and record information for their culminating project.

Links With More Information About Waves/Tsunamis

Enchanted Learning

Tsunami

[www.enchantedlearning.com/subjects/tsunami/]

International Tsunami Information Center

Tsunami.

[www.youtube.com/watch?v=4Xebwzb3dDE&feature=related]

King County

Prepare

[www.kingcounty.gov/safety/prepare/residents_business/Hazards_Disasters/Tsunamis.aspx]

Pacific Tsunami Museum

[www.tsunami.org/]

Tech Ocular

An insight into technology

[<http://techocular.wordpress.com/2011/03/11/tsunami-early-warning-system/>]

UNESCO/IOC-NOAA International Tsunami Information Center.

Tsunami Basics

[http://itic.iocunesco.org/index.php?option=com_content&view=article&id=1755&Itemid=2000&lang=en]

WGBH Educational Foundation

Anatomy of a Tsunami

[www.pbs.org/wgbh/nova/earth/anatomy-tsunami.html]

Links With Information About General Ocean Safety

Science of the Surf: Episodes 1, 2, and 3.

[www.youtube.com/watch?v=6lyRE9azhwQ&feature=relmfu]

[www.youtube.com/watch?v=aXuQC1qRuEM&feature=relmfu]

[www.youtube.com/watch?v=6lyRE9azhwQ&feature=relmfu]

HowStuffWorks, Inc. How Ocean Currents Work.

[<http://science.howstuffworks.com/environmental/earth/oceanography/ocean-current1.htm>]

Office of Naval Research. Ocean in Motion: Waves—Characteristics.

[www.onr.navy.mil/focus/ocean/motion/waves1.htm]

University of Hawai'i. High Surf.

[www.pdc.org/iweb/high_surf.jsp?subg=1]

III. Understanding a Word Learning Strategy

Objective

Student is able to accurately:

- Remove a prefix from the base word.
- Figure out its meaning using the context of the sentence.
- Write a sentence using the word in a sentence.
- Illustrate or find a relevant photo or picture for the sentence.

Length

45 minutes

Materials

1. Appendix 3.3: Waves! Prefixes.
2. Glossary.
3. Waves! text-set.

III. Understanding a Word Learning Strategy, Prefixes and Suffixes

1. Follow the procedures in Appendix 3.3: *Pele Waves* Prefixes.
2. The goal is for students to apply the Prefix removal strategy independently.

Assessment: Given target words with prefixes, students accurately apply the word learning strategy to figure out the meaning of the word.

Appendix 3.1: Waves! Waves/Tsunamis Student Handbook Culminating Project

Culminating Project

Define the Waves! Culminating Project

No matter which island we live on, waves and/or tsunamis have at one time shaped and reshaped the land where we live. Students create a *Student Handbook on Waves or Tsunamis*.

Concepts/Themes

Slow changes in the Earth's crust, known as slow processes (tectonic plates), reshape its surface over time.

Sudden changes in the Earth's crust, known as fast processes, reshape its surface over time (e.g., volcanic eruptions, earthquakes, floods, and tsunamis).

Purpose

Practice, clarify, and internalize how waves and tsunamis shape and reshape our land in Hawai'i.

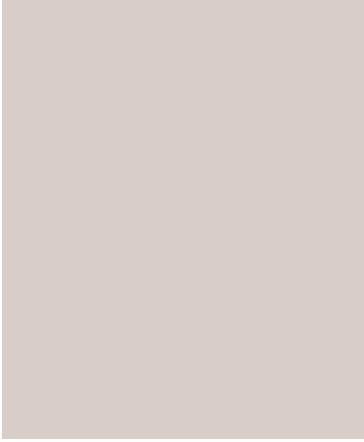
Procedure

Schools that are located in tsunami inundation areas can create a *Student Handbook on Tsunami Awareness and Safety*.

1. See Pages 27–30 in *Waves!* for awareness and safety systems. The information about the safety systems provides general information for the Hawaiian Islands. The goal of the task is to add information about the places specific to where the students live.
2. Select information that would be relevant to students. The following are considerations:
 - a. The location of where you live, including maps of inundation areas.
 - b. Historic information about tsunamis where you live.
 - c. Stories related to tsunamis where you live.
 - d. Landmarks that remind people of the stories, including excerpts from *Pele Searches for a Home*.
 - e. Tsunamis from across the Pacific and/or Hawai'i-generated tsunamis.
 - f. Photos and images of the area.
 - g. Safety systems including warning systems and evacuation procedures and places.
 - h. Other ideas that are relevant to the students.

Schools that are not in the inundation area could also prepare a *Student Handbook on General Ocean Safety*.

1. See Pages 7–10 “Understanding Waves” in *Waves!*. The information about waves and ocean motions provides general information. The goal of the task is to add information about the places where students live.



2. Select the information that would be relevant to the students. The following are considerations:
 - a. Location where students live, including maps of beaches frequented.
 - b. Description of wave patterns of the area.
 - c. Stories related to wave adventures (surfing, body surfing, etc.).
 - d. Photos and images of the area and wave patterns.
 - e. Safety systems including high surf warnings, rip currents, and tide changes.

Appendix 3.2: Waves! Student Project Checklist

Project Checklist

Note: Apply class-relevant criteria for project development

Project Checklist		
Criteria	Yes	No
1. Does the project show how waves/tsunamis have shaped and/or reshaped the land?		
2. Do participants apply collaborative practices in completing the project?		
3. Is the project authentic and relevant to all 4th grade students?		
4. Does the project summary use evidence to explain the impact of waves/tsunamis in the area where students live?		
5. Are the class selected topics (content) complete and accurate?		
6. Does the project incorporate class goals/performance targets in writing and presentation of material?		
7. Others as determined by the teacher and class.		

Appendix 3.3: Waves! Prefixes

Prefix and Suffix Squares

What Are Prefix and Suffix Squares?

Prefix and suffix squares is a strategy that students can use to make personal associations with unfamiliar words by using graphics as they learn the meanings of prefixes and suffixes. As students learn the strategy, encourage them to apply it in a variety of contexts to develop their problem-solving skills in using the word parts to understand the meaning of unknown words.

Purposes

1. To create personal associations in picture form for unfamiliar words.
2. To develop the strategy to independently figure out the meanings of unfamiliar words that begin with a prefix or end with a suffix.

Materials

1. Blank prefix-suffix squares template.
2. Drawing tools.
3. Dictionary.

Procedure

1. Introduce the idea to the class by modeling the process with a few examples. Using the *think-aloud strategy* will help students in developing the skills of independently applying the strategy when they encounter an unfamiliar word with a prefix or suffix.
2. Divide a drawn square into four parts and label the four parts according to the prefix/suffix sample (on Page 44 and 45).
3. In the top-right corner of the square, write a word that has the prefix or suffix that the class is focusing on.
Prefixes: *un-, dis-, in-, im-, ir-, re-*
Suffixes: *-ly, -ion, -tion, -ation, -ition, -er, -or, -able, -ible*
4. Remove the prefix or suffix and place it in the top-left corner of the square.
5. It is also important to have students be aware of the following prefix tips:
 - a. Check to see if the part of the word left is a real word. Not all *dis-* are prefixes. For example in the word disaster, removing the *dis-* leaves (aster), which is not a base word. So *dis-* in disaster is NOT a prefix.
 - b. Prefixes have more than one meaning. For example, *dis-* may mean *not* (dissatisfied) or *do the opposite of* (displace).
 - c. Use the context of the word to figure out the meaning of the word. Do not rely only on the prefix and suffix.
6. In the bottom-left corner, write the meaning of the prefix or suffix.
7. In the bottom-right corner, draw a picture of the word and add

a caption to it.

8. Have students collect words that share the same prefixes and suffixes that are the focus of study. In *E Ho'omau!*, the students encounter the following prefixes:

Prefixes: *un-, dis-, in-, im-, ir-, re-*

Suffixes: *-ly, -ion, -tion, -ation, -ition, -er, -or, -able, -ible*

9. Students share their squares by placing squares with similar prefixes together on a display board.
10. Have a discussion with the students focused on arriving at the word's meaning by removing the prefix or suffix, seeing it in context (caption), and associating the word with the picture.


E Ho'omau! Prefixes

un: *unwilling, undeveloped, undetected, unavoidable*

in: *inactive, indisposible, impossible, impolite, irregular*

dis: *discontent, disbelief, disorganized*

Prefix Square

<p>Prefix</p> <p>dis-</p>	<p>A Word that has the prefix and its meaning</p> <p><u>disbelief</u> a condition of not willing to believe something</p>
<p>Meaning of the Prefix</p> <p>not</p>	<p>Graphic of the word</p>  <p>The people watched in disbelief as the wave washed boulders from the breakwater onto the highway.</p>

References

Bromley, Karen. (2002). *Stretching students' vocabulary: Vocabulary squares* (pp. 85–86). NY: Scholastic Professional Books.

PELE SEARCHES FOR A HOME: WAVES!

Lesson 4

Table of Contents

Adapting and Integrating the Understanding of Waves

Adapt, Exhibit, and Pose New Questions

Driving Question: *Now that you understand waves and tsunamis, what can you do with this understanding?*

Learning Engagements	Pages
I. Completing the culminating project, “Waves/Tsunamis Student Handbook” (See Appendix 4.1: <i>Waves! Waves/Tsunamis Student Handbook</i>)	47 49
II. Presenting the culminating project (See Appendix 4.2: <i>Waves! Student Handbook Checklist</i>)	47 51



Donna Saiki, Pacific Tsunami Museum Director

Pele Searches for a Home: Waves!

Lesson 4

E Pūlama I ka Ho‘oilina (Cherish Your Heritage)

Your Turn! Creating a Student Handbook



Lesson Notes

I. Completing the Culminating Project

Concept/Theme

Sudden changes in the Earth's crust, known as fast processes, reshape its surface over time (e.g., volcanic eruptions, earthquakes, floods, and tsunamis).

Objectives

Students use evidence to explain how fast processes have shaped and reshaped the surface of the Earth where they live.

Length

Ongoing throughout Waves! Lessons

Materials

1. Access to computers and Internet services.
2. PowerPoint and MS Word processing software, if needed.
3. Group defined materials

Adapting and Integrating the Understanding of Waves

Adapt, Exhibit, and Pose New Questions

Driving Question: *Now that you understand waves, what can you do with this understanding?*

I. Completing the Culminating Project to Demonstrate Understanding of Waves

1. With the students, outline the procedure for completing the project.
2. Complete the project.
3. Students and teacher review the criteria before, during, and after the project. (See Appendix 4.1: *Waves! Waves/Tsunamis Student Handbook*)

Note: Provide tutorial sessions on the use of PowerPoint or Word, if this is an option for the project production.

II. Presenting “Waves/Tsunamis Where I Live”

Arrange for students to present the final project.

1. Present to groups beyond the classroom, with the intent to add to the community information about wave/tsunami safety.

to complete the project.

**II. Presenting
“Waves/Tsunamis
Where I Live”**

Objective

Students satisfactorily meet the project criteria.

Length

Dependent on the scope of the presentation

Materials

1. *Presentation material.*
2. *Completed project.*

2. Present to other classrooms.
3. Projects may be placed in a display at the library at school and in the community.

Assessment: Student projects meet the project criteria. See Appendix 4.2: *Waves!* Project Criteria Checklist.

Appendix 4.1: Waves! Waves/Tsunamis Student Handbook

Culminating Project

Define the Culminating Project

No matter which island we live on, waves and/or tsunamis have at one time shaped and reshaped the land where we live. Students create a *Student Handbook on Waves or Tsunamis*.

Themes/Concepts

Slow changes in the Earth's crust, known as slow processes (tectonic plates), reshape its surface over time.

Sudden changes in the Earth's crust, known as fast processes, reshape its surface over time (e.g., volcanic eruptions, earthquakes, floods, and tsunamis).

Purpose

Practice, clarify, and internalize how earthquakes shape and reshape our land in Hawai'i.

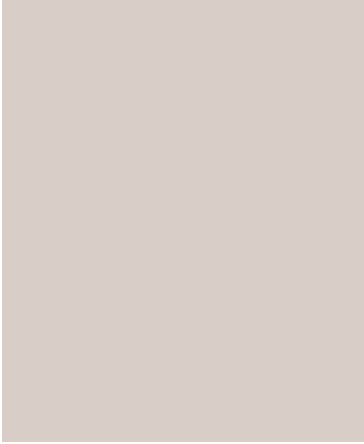
The culminating project was introduced at the beginning of the *Waves!* lessons. Students will complete the culminating project during Lesson 4.

Schools that are located in tsunami inundation areas can create a *Student Handbook on Tsunami Awareness and Safety*.

1. See Pages 27–30 in *Waves!* for awareness and safety systems. The information about the safety systems provides general information for the Hawaiian Islands. The goal of the task is to add information about the places where students live.
2. Select the information that would be relevant to students. The following are considerations:
 - a. The location of where students live, including maps of inundation areas.
 - b. Historic information about tsunamis where students live.
 - c. Stories related to tsunamis where students live.
 - d. Landmarks that remind people of the stories including excerpts from *Pele Searches for a Home*.
 - e. Tsunamis from across the Pacific and Hawai'i-generated tsunamis.
 - f. Photos and images of the area
 - g. Safety systems, including warning systems and evacuation procedures and places.
 - h. Other ideas that are relevant to the students.

Schools that are not in the inundation area could also prepare a *Student Handbook on General Ocean Safety*.

2. See Pages 7–10 on “Understanding Waves” in *Waves!*. The information about waves and ocean motions provide general information. The goal of the task is to add information about the places where students live.



3. Select the information that would be relevant to the students. The following are considerations:
 - a. Location of where students live, including maps of beaches frequented.
 - b. Description of wave patterns in the area.
 - c. Stories related to wave adventures (surfing, body surfing, etc.).
 - d. Photos and images of the area and wave patterns.
 - e. Safety systems, including high surf warnings, rip currents, and tide changes.

Appendix 4.2: Waves! Student Handbook Checklist

Note: Apply class-relevant criteria for project development

Project Checklist		
Criteria	Yes	No
1. Does the project show how waves/tsunamis have shaped and/or reshaped the land?		
2. Do participants apply collaborative practices in completing the project?		
3. Is the project authentic and relevant to all 4th grade students?		
4. Does the project summary use evidence to explain the impact of waves/tsunamis in the area where they live?		
5. Are the class selected topics (content) complete and accurate?		
6. Does the project incorporate class goals/performance targets in writing and presentation of material?		

Vocabulary Practice

PELE SEARCHES FOR A HOME: WAVES!

Pele Searches for a Home: *Waves!*

Cloze Sentences

Select the appropriate word to complete each sentence.

1. No one expected the _____ of the storm to be so high.
 - a. intensity
 - b. integrity
 - c. intelligently
 - d. internally

2. When the storm arrived, there was a _____ of floodwaters that caused minor damages. .
 - a. surgery
 - b. surly
 - c. surplus
 - d. surge

3. It is uncertain whether a warning will be issued for an impending _____.
 - a. tatami
 - b. tsunami
 - c. origami
 - d. calamari

4. I stared in utter _____ when the volcano destroyed the village.
 - a. relief
 - b. disbelief
 - c. retrieve
 - d. mischief

5. The earthquake was an unfortunate natural _____.
 - a. discharger
 - b. disaster
 - c. dissenter
 - d. disclaimer

6. A tiny toy is a choking _____ for babies.
 - a. hazy
 - b. hasten
 - c. hazel
 - d. hazard

7. The river's _____ is a spring up in the valley.
 - a. organ
 - b. orient
 - c. oregano
 - d. origin

8. She has the _____ to become a brilliant writer.
- a. potential
 - b. potently
 - c. potency
 - d. potion
9. Your little dog is not a _____ to me.
- a. thrive
 - b. throb
 - c. threat
 - d. thrust
10. The _____ runner passed all her opponents to win the race.
- a. swim
 - b. swig
 - c. switch
 - d. swift

Pele Searches for a Home: Waves!

Matching Words with Definitions

Select the word for the definition that is provided.

1. strength or power of something
 - a. intensity
 - b. diversity
 - c. necessity
 - d. curiosity

2. a strong forward motion
 - a. birch
 - b. surge
 - c. church
 - d. perch

3. a very large, often destructive sea wave, or a series of waves, caused by an earthquake, landslide, volcano, or meteorite and extends from the surface to the ocean floor
 - a. balmy
 - b. pastrami
 - c. salami
 - d. tsunami

4. a condition of being unable or not willing to believe
 - a. disbelief
 - b. dissolve
 - c. dissatisfy
 - d. destroy

5. an event that causes great damage or destruction
 - a. forecaster
 - b. telecaster
 - c. disaster
 - d. broadcaster

6. something that is very dangerous and likely to cause damage
 - a. wizard
 - b. buzzard
 - c. hazard
 - d. haphazard

7. the point or place from which something comes; locate
 - a. origin
 - b. porcelain
 - c. religion
 - d. legion

8. having the ability to develop, achieve, or succeed
 - a. essential
 - b. sequential
 - c. credential
 - d. potential

9. something or someone likely to cause harm
 - a. bleat
 - b. threat
 - c. sweat
 - d. defeat

10. moving very quickly
 - a. drift
 - b. shift
 - c. swift
 - d. thrift

Pele Searches for a Home: Waves!

Word Antonyms

Select the appropriate antonym. Write the word in the blank.

1. Far is to near as **intensity** is to _____.
 - a. softness
 - b. strength
 - c. vigor
 - d. zeal

2. High is to low as **surge** is to _____.
 - a. billow
 - b. heave
 - c. soar
 - d. ebb

3. Friend is to enemy as **originate** is to _____.
 - a. copy
 - b. create
 - c. develop
 - d. generate

4. Import is to export as **potential** is to _____.
 - a. likely
 - b. probable
 - c. possible
 - d. not promising

5. Push is to pull as **threat** is to _____.
 - a. danger
 - b. risk
 - c. safety
 - d. hazard

6. Ignore is to notice as **swift** is to _____.
 - a. slow
 - b. fast
 - c. quick
 - d. hurried

Pele Searches for a Home: *Waves!*

Semantic Association of Words

Select 2 words that are associated with the first word.

1. Intensity

- a. strength
- b. power
- c. precise
- d. exact

2. surge

- a. accelerate
- b. descend
- c. decline
- d. rise

3. tsunami

- a. calm
- b. still
- c. surge
- d. seismic

4. disbelief

- a. doubt
- b. truth
- c. shock
- d. faith

5. disaster

- a. blessing
- b. damage
- c. destruction
- d. fortune

6. hazard

- a. safe
- b. protected
- c. danger
- d. damage

7. origin

- a. beginning
- b. source
- c. end
- d. finish

8. potential

- a. unskilled
- b. ability
- c. failure
- d. possibility

9. threat

- a. danger
- b. safety
- c. protection
- d. warning

10. swift

- a. fast
- b. delay
- c. slow
- d. quick

Pele Searches for a Home: *Waves!*

Vocabulary Challenge 1

1. If the **intensity** of something increases, it gets _____.
 - a. shorter
 - b. weaker
 - c. stronger
 - d. coarser
2. A **surge** happens when a force _____.
 - a. increases
 - b. decreases
 - c. stops
 - d. slows down
3. A **tsunami** is usually described as
 - a. calm
 - b. weak
 - c. uneventful waves of water
 - d. powerful
4. Some people tell of their **disbelief** by saying the event was _____.
 - a. common
 - b. incredible
 - c. familiar
 - d. entertaining
5. Which of these is NOT a **disaster**?
 - a. an earthquake
 - b. a tsunami
 - c. a hurricane
 - d. a drizzle
6. If something is a **hazard** to your health, you should _____.
 - a. have as much of it as possible
 - b. recommend it to your friends
 - c. avoid it
 - d. use it daily
7. When someone asks about your **origin**, they want to know _____.
 - a. where you are from
 - b. where you live now
 - c. where you plan to go
 - d. where you go to school

8. If someone says you have **potential**, he thinks that you will probably _____.
- a. fail
 - b. sleep
 - c. succeed
 - d. lose
9. If something is a **threat** to you, it could _____
- a. protect you
 - b. hurt you
 - c. be a safe place to hide
 - d. be something you've been waiting for
10. If you're moving **swiftly**, you're probably _____.
- a. in a hurry
 - b. sleepy
 - c. sore
 - d. sick

Pele Searches for a Home: Waves!

Vocabulary Challenge 2

1. An example of **intensity** is _____.
 - a. a plan to take a vacation
 - b. a response to an insult
 - c. the strength of the wind
 - d. an area in a hospital for the very sick
2. Which of the following best describes a **surge**?
 - a. a sudden, greatly increased change in a force
 - b. a slow change over a long period of time
 - c. no change at all
 - d. when a force starts, then stops, then starts again
3. A **tsunami** is a powerful movement of _____.
 - a. lava
 - b. magma
 - c. wind
 - d. water
4. To stare in **disbelief** means to _____.
 - a. continue to look at something
 - b. be rude
 - c. watch something arrive
 - d. see something you don't think is true
5. If you see a "**Disaster** Area" sign, it probably is _____.
 - a. the front desk of a hotel
 - b. a dumpster for trash
 - c. where there is much damage to property
 - d. a driving range for golfers
6. If you see the sign, "Fire **Hazard**" in front of an abandoned building, it _____.
 - a. is dangerous because it can easily ignite
 - b. is fireproof
 - c. has many fire safety features
 - d. is located outside of a fire zone
7. To find out the **origin** of a river, you would try to learn _____.
 - a. where it ends
 - b. the places it flow through
 - c. how wide it is
 - d. where it begins

8. An example of someone who has developed his potential is a person who _____.
- a. is elegant
 - b. is timid
 - c. is now a great musician
 - d. lacks money
9. An example of a **threat** is _____.
- a. an approaching storm
 - b. a bird in its nest
 - c. the shallow and calm ocean
 - d. a safe neighborhood
10. Which of the following is NOT an example of **swift**?
- a. a cheetah running
 - b. an elephant walking
 - c. a high-speed chase
 - d. paddling a kayak through white water rapids

Pele Searches for a Home: Waves!

Vocabulary Answer Sheet

Cloze Sentences	Word Definitions	Word Antonyms	Semantic Associations	Challenge 1	Challenge 2
1. intensity	1. intensity	1. softness	1. strength / power	7. c. stronger	1. c. the strength of the wind
2. surge	2. surge	2. ebb	2. accelerate / rise	8. a. increases	2. a. a sudden, greatly increased change in a force
3. tsunami	3. tsunami	3. copy	3. surge / seismic	9. d. powerful	3. d. water
4. disbelief	4. disbelief	4. not promising	4. doubt / shock	10. b. incredible	4. d. see something you don't think is true
5. disaster	5. disaster	5. safety	5. damage / destruction	11. d. a drizzle	5. c. where there is much damage to property
6. hazard	6. hazard	6. slow	6. danger / damage	12. c. avoid it	6. a. is dangerous because it can easily ignite
7. origin	7. origin		7. beginning / source	13. a. where you are from	7. d. where it begins
8. potential	8. potential		8. ability / possibility	14. c. succeed	8. c. is now a great musician
9. threat	9. threat		9. danger / warning	15. b. hurt you	9. a. an approaching storm
10. swift	10. swift		10. fast / quick	16. a. in a hurry	10. b. an elephant walking