Looking for Clues

Grades K-4

Overview:

Students identify visual signs that may precede a tsunami, such as an earthquake, unusual bubbling in the sea water, and an unusually low receding waterline. Students also propose safe actions in the event of actual observations.

Targeted Alaska Grade Level Expectations:

Science

[3,4] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

[4] SD2.2 The student demonstrates an understanding of the forces that shape Earth by identifying causes (i.e., earthquakes, tsunamis, volcanoes, landslides, and avalanches) of rapid changes on the surface.

Objectives:

The student will:

- define the term “receding waterline;”
- propose safe actions when pre-tsunami signs are observed; and
- identify visual signs that may precede a tsunami.

Materials:

- large Styrofoam bowl
- scissors
- regular-sized balloon
- small binder clip
- 1 cup of gravel
- pitcher
- large tray or pan to catch dripping water
- VISUAL AID: “Tsunami Waves Inundating a Coastal Town”
- STUDENT WORKSHEET: “Looking for Clues”

Science Basics:

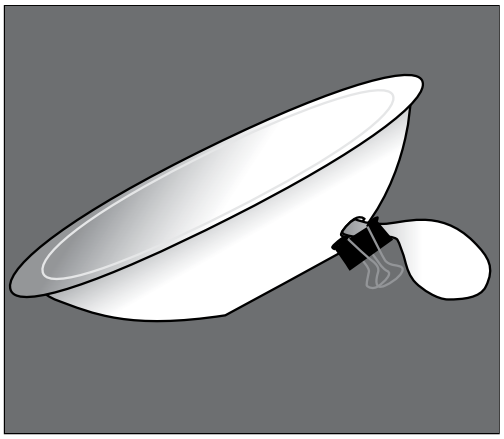
There are several observable signs that may precede a tsunami. Some signs may be observed visually, such as an earthquake, unusual bubbles in the water, or an unusually low, receding waterline. Sometimes the seafloor may be exposed for hundreds of feet, revealing seaweed, sunken ships, floundering sea life and debris. Olga Bay Narrows and Akhiok resident Nick Alokli was in Old Harbor at the time of the 1964 earthquake and tsunami. He remarked, “Sitkalidak Strait dried up completely. We could see the rocks in the middle of the strait.” Other people in Old Harbor remember watching the water and noted strange tidal action. In the narrows between Sitkalidak Island and Kodiak Island, some men watched from a boat as the beach dried up behind them and then filled up again.

In Phuket, Thailand on December 26, 2004, a ten-year old girl named Tilly Smith was able to use knowledge of tsunamis to save the lives of her family members and other vacationers. Tilly reported in an interview with the media, “I was on the beach and the water started to go funny. There were bubbles and the tide went out all of a sudden. I recognized what was happening and had a feeling there was going to be a tsunami. I told mummy.” Tilly had just learned about earthquakes and tsunamis from her geography teacher at school in England before she went on vacation.

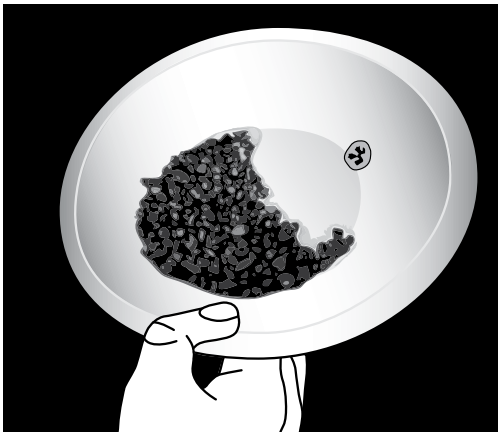
Science Basics (continued):

For low-lying areas along the coast, safety precautions require that people move inland and uphill quickly in the event of an earthquake. Wait for an official all clear before returning.

Activity Preparation:



1. In the bottom crease of the Styrofoam bowl, cut a small hole. Feed the tip of the balloon through the hole until the rim of the balloon is snug against the hole.



2. Make sure all the air is out of the balloon. Close off the opening of the balloon on the outside of the bowl with the small binder clip.

3. Place a small amount of gravel inside the bowl across from the hole for the balloon. This gravel should represent the slope of a waterline.
4. Que computer screen to view VISUAL AID: "Tsunami Waves Inundating a Coastal Town" from the ATEP DVD or online at www.aktsunami.com in student resources.

Activity Procedure:

1. Explain that there are different clues that people may see before a tsunami wave hits shore. One clue is earthquakes. Another clue is unusual bubbles in the seawater. Another clue is an unusually low receding waterline. Write these clues on the board. Ask students if they know what these clues look like. Students will be familiar with earthquakes and bubbles, but less familiar with the receding waterline. Explain that the students will see a model of a receding waterline.
2. Hold the Styrofoam bowl over the tray and pour in enough water so that some of the gravel is exposed. Explain that the gravel represents land and the water represents sea. Ask students to look closely to see which part of the land is above sea level and which part is below. Ask students to identify the waterline. Explain that this is important because they are about to see a model of a receding waterline. Discreetly remove the binder clip and ask students to continue observing. The waterline should drop as the balloon fills up with water. Ask students to describe what happened to the waterline. Explain that the word "recede" means to move back. Ask students to define the term "receding waterline." Allow time for thinking before calling on students for responses. Clarify that the waterline moves back when it recedes. Repeat the demonstration if necessary.
3. Display VISUAL AID: "Tsunami Waves Inundating a Coastal Town." As it is viewed, note the normal waterline at the beginning, then the extent of the receded waterline.
4. Share the information from the first two paragraphs of "Science Basics." Add items to the list of things that may be seen before a tsunami wave strikes the shore. The list should include: earthquakes, un-

usual bubbles and an unusually low receding waterline (sea weed, sea floor, sunken ships, rocks, sea life, and debris).

Critical Thinking:

Think-Pair-Share: Ask students what they would do if they were to see these signs of an incoming tsunami. Allow time for thinking and then ask students to share their ideas with a partner. Call on students to share their responses or their partner's response with the rest of the class. In the event of an earthquake in coastal areas, emphasize that the best course of action would be to move inland and uphill quickly.

5. Distribute STUDENT WORKSHEET: "Looking for Clues."

Answers:

Page 1:


4


5


3


1


6


2

Page 2: Student writing and drawing should depict earthquakes, unusual bubbles or an unusually low receding waterline (sea weed, sea floor, sunken ships, rocks, sea life, and debris).

Name:________________________________

Student Worksheet (page 1 of 2)

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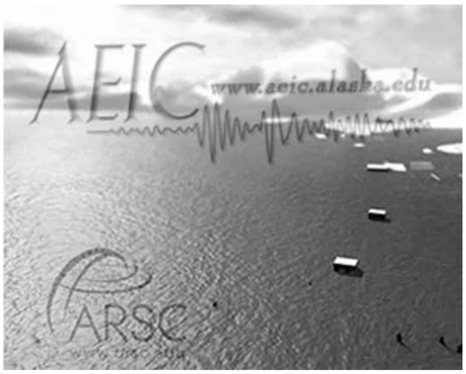
Directions: Number the pictures below to show the order of a tsunami wave striking a community.



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Name:_____

Student Worksheet (page 2 of 2)

Looking for Clues

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Directions: In the empty boxes below, draw or write two things that may be observed before a tsunami wave.

Before a tsunami I might see...