It's Good to be Prepared for an Earthquake

Grades K-4

Overview:

Knowing safety procedures before, during and after an earthquake can prevent injury and property damage. In this lesson students review the cause of earthquakes and their relationship to tsunamis, review emergency preparedness procedures, practice "drop, cover, and hold on" and review after-quake safety measures. This lesson assumes students have completed Unit 3: What's On Your Plate or Unit 4: Earthquakes and Tsunamis.

Targeted Alaska Grade Level Expectations:

Science

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

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

Reading

[k-3] 1.4.2 The student restates/summarizes information by stating information after listening to text.

[k-3] 1.5.1 The student demonstrates an understanding of main idea by identifying the most important idea of a text.

[k-3] 1.6.1 The student follows oral and written directions by following two-step oral directions to complete a task.

[k-3] 1.10.1 The student connects themes by making relevant connections between text and personal experiences and other texts.

Objectives:

The student will:

- hear a story about earthquakes and discuss the cause;
- practice "drop, cover and hold on;"
- learn about earthquake and tsunami preparedness.

Materials:

- *Earthquakes* by Ellen Prager
- Source of music such as a radio or a CD player (optional: find a version of the 1950s song *Shake, Rattle & Roll*)
- World map showing major plate boundaries
- Sticky note or small piece of paper
- Scissors (one per student)
- Glue stick (one per student)
- White board or chart paper
- Clip board
- Informational Booklet, *Are you prepared for the next big earthquake in Alaska?* (1 per student plus one for teacher)
- STUDENT WORKSHEET: "Let's get ready for an Earthquake!"
- STUDENT INFORMATION SHEET: "Here comes an Earthquake!"
- FAMILY LETTER: "Preparedness is a Family Affair"

Whole Picture:

The majority of injury and death resulting from an earthquake is a direct result of falling debris and the failure of infrastructure. Safety precautions that can prevent injury can be put into place prior to an earthquake. During an earthquake, knowing how to stay safe can prevent injury. When the earthquake is over, there are important safety checks to complete. A prepared emergency kit will ensure access to safe food and water if utilities are damaged during an earthquake. A large earthquake can also trigger tsunamis in coastal areas, so it is important to know warning signs and safety measures.

Activity Preparation:

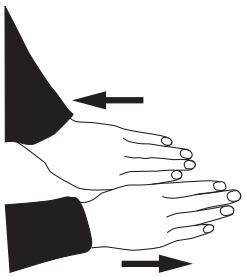
1. Staple FAMILY LETTER: "Preparedness is a Family Affair" to the cover of brochure, *Are you prepared for the next big earthquake in Alaska?* Prepare one per student.
2. Using a sticky note or small piece of paper, cut out a simple house shape then write the words "My House." Keep it near the world map.
3. Review Informational Booklet, *Are you prepared for the next big earthquake in Alaska?* for background information.

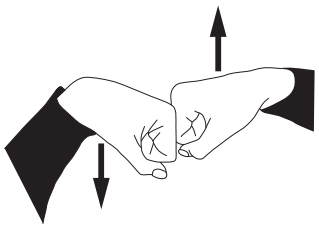
Activity Procedure:

1. Ask students what they would think if they were laying in bed and their house started to shake. Brainstorm what kinds of things could make it shake (i.e. construction nearby, the washing machine spin cycle, a large truck driving by, an earthquake, etc.) Show students the book, *Earthquakes*, by Ellen Prager. Ask students to watch and listen for three things:
   a. What causes earthquakes?
   b. What happens to buildings during an earthquake?
   c. What do school children do during the earthquake?

   Read and discuss the book with students.

2. Show students a world map that shows major plate boundaries. Explain when plates move they can move in different ways – sideways and up and down. The sideways movement along plate boundaries can be modeled by sliding two hands (plates) past each other. This is one way plates can cause earthquakes. Students should imitate your actions as you model.





3. The up and down movement of the plates can be modeled by making fists (the plates) and pressing the fists together along the knuckles. In normal faulting, one plate will push downward, so slide one fist downward along the knuckles. Sometimes the pressure will build up so much that the other plate will suddenly shove upward.
4. Reiterate page 6 in *Earthquakes*, which states there are many earthquakes around the world everyday. Emphasize that most earthquakes are too small to feel and that it is very rare to have an earthquake large enough to cause damage. Refer to the world map again and place the simple house shape directly on top of a plate boundary. Ask students to consider what would happen to the house if a large earthquake occurred. (Consider shaking the house shape as students share answers.) Move the house to an area of the map away from a boundary. Ask the question again. Explain that earthquakes can often be felt even far from plate boundaries if the earthquake is strong, but it is especially important to be prepared for an earthquake in places that experience a lot of plate movement (such as Alaska).

5. Explain students will do activities to help them be prepared in case of a large earthquake: they will review the items needed for an emergency kit and they will play a fun game to practice earthquake safety. They will also take home information to share with family members.

6. Brainstorm the kinds of damage that might occur during a strong earthquake. Have students think about home, school and other community areas. Note visible power lines. Ask them to think of things buried under ground. Write student ideas on a white board or a piece of chart paper. Ask students how a parent would cook dinner if the electricity was knocked out by an earthquake. Ask how they would get water if the water lines were broken during an earthquake. Explain that it is important to have things on hand to help until power is restored and water lines are fixed.

7. Hand out STUDENT WORKSHEET: "Let's get ready for an Earthquake." Review the text at the top of page one with students: Choose a volunteer to read aloud or ask the class to read chorally. Review all of the options for the emergency kit pictured on page two. Explain what each picture represents so students understand their options. Students should cut out pieces from the page then glue the items appropriate for an emergency kit on page one. Students can then glue the tab for the cover. Remind students to put only essentials in the Emergency Kit, and to watch out for perishable items.

   As students finish putting together their emergency kit, have them find a partner who is also finished and read the bottom section of the worksheet. When all students are finished, review the material as a class and discuss.

8. Tell students now that they have learned how to get ready for an earthquake, the next step is learning what to do if a big earthquake comes. Hand out STUDENT INFORMATION SHEET, "Here Comes an Earthquake." Review areas of the classroom that would be safe during and earthquake. Practice "drop, cover and hold on."
   - Set up your music source.
   - Appoint one student to be the Earthquake Safety Inspector. This role should rotate each round. The inspector will start near the music source. Allow the inspector to carry a clipboard with a copy of STUDENT INFORMATION SHEET: "Here comes an Earthquake," so they can refer to the checklist.
   - When the Safety Inspector turns on the music, students should move throughout the classroom. When the inspector turns off the music, students must find a safe place in the room to drop, cover and hold on.
   - The safety inspector should then move throughout the room to make sure the students chose a safe cover and has as much of his or her body protected as possible, especially the head.
   - Repeat as many times as you wish!
     After the game, talk about rooms that may have no cover, such as the bathroom, and discuss a safe alternative to drop, cover and hold on, such as covering your head with hands and arms or a pillow.

9. Follow-up questions:
   a. What causes earthquakes?
   b. What should be packed in an emergency kit?
   c. What should you do in a big earthquake?
   d. What do earthquakes have to do with tsunamis?
   e. Do all earthquakes start tsunamis?
   f. What should you do if there is a tsunami warning?

10. Hand out FAMILY LETTER: "Preparedness is a Family Affair," attached to the informational booklet, *Are you prepared for the next big earthquake in Alaska?* and have students take it home to share.

Extension Idea:

Practice drop, cover and hold on in other areas of the school, such as the library and the gym. In a library the biggest hazard is falling books and bookshelves. In the gym there is little cover and stu-

dents must adapt accordingly. Schools in coastal communities should review tsunami safety. Ask students where they should go and what they should do if they are at school and they hear the tsunami warning siren.

Answers:

In no particular order students should place the following eight cut-outs in their emergency kit:

Bag of food
Batteries
First aid kit
Crescent wrench
Radio
Water jug
Candles and matches
Flashlight

Additional Resources:

Geophysical Institute. Retrieved August 13, 2009, from Alaska Earthquake Information Center Website: http://www.aeic.alaska.edu/

Givon, H. G., & Uttal, D. (1996). *We shake in a quake*. Berkeley, Calif: Tricycle Press.

Branley, F. M., & Rosenblum, R. (1990). *Earthquakes. A Let's-read-and-find-out science book*. New York: Crowell.

Field, N., Schepige, A., & Lynch, N. (1995). *Discovering earthquakes: Mysteries, secret codes, games, mazes*. Middleton, WI: Dog-Eared Publications.

Lesson Information Sources:

Alaska Earthquake Information Center. *Are you prepared for the next big earthquake in Alaska?* (1st ed.) [Brochure]. Fairbanks, AK.

Prager, E. J., & Greenstein, S. (2002). *Earthquakes. Jump into science*. Washington, D.C.: National Geographic Society.

Name:_____

Grades K-4

Let's Get Ready for an Earthquake!

Student Worksheet (page 1 of 2)

A family emergency kit will ensure you are ready in case an earthquake damages power lines or water supply.

Directions: Choose items from page two that will help your family. Make sure the items are important for your health and safety and will keep for long periods of time. Glue the items in the square below, then glue on the cover.

Glue emergency kit cover tab to the shaded area.

Here are more ways your family can prepare for a large earthquake. Check off each item as you read it to a partner.

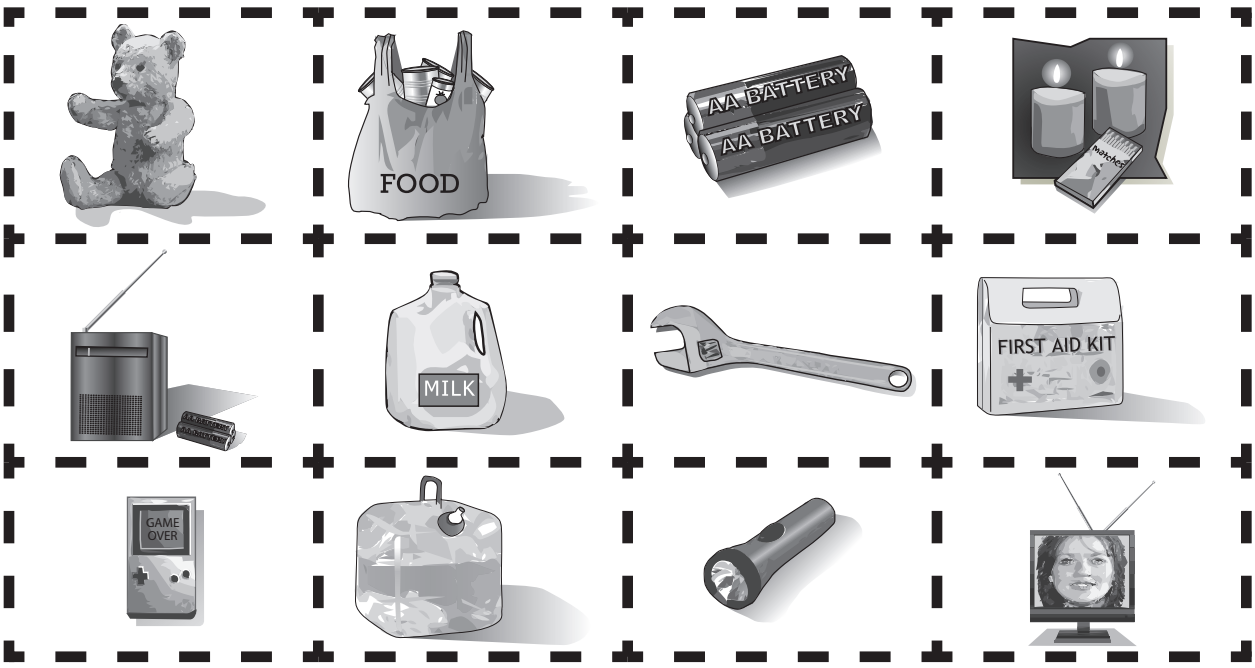
- ☐ Prepare an emergency plan.
- ☐ Know how to turn off gas, water and electricity.
- ☐ Anchor tall, heavy objects (like bookcases, wall units) to walls.
- ☐ Make sure there are no heavy objects over beds or seating areas.

Name:_____

Let's Get Ready for an Earthquake!

Student Worksheet (page 2 of 2)

Directions: Cut out items that belong in an emergency kit then glue them in place on page one of your worksheet. Cut out the cover, crease along the dotted line then glue the tab in place.



Fold on dotted line. Glue to shaded area of box on previous page.

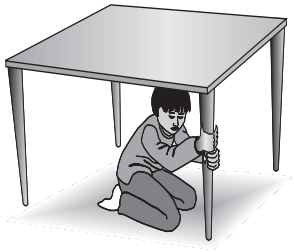
Emergency Kit

Here Comes an Earthquake!
Student Information Sheet

Grades K-4

During a strong earthquake it is important to know how to be safe from falling items, such as bookshelves, kitchen cabinets, television stands, and light fixtures. Here is the best way to be safe when the shaking starts:

- Stay calm
- Drop to the floor
- Find cover under a table, bed or other sturdy object. If nothing is near, cover your head with your hands and arms, or a pillow.



- Hold on tight to the leg of the table. It could move during the shaking, exposing you to falling items.
- Stay put until the shaking stops.
- An easy way to remember this is: drop, cover and hold on!

Inspector's Checklist

- ☐ **Did everyone find safe cover?**
- ☐ **Was everyone's head and body protected?**
- ☐ **Was everyone away from risk of falling, heavy objects?**

Preparedness is a Family Affair

Family Letter

Grades K-4

Dear Parents,

Our class has been learning about earthquake safety. Your student learned that there are things everyone should do **before**, **during** and **after** a large earthquake.

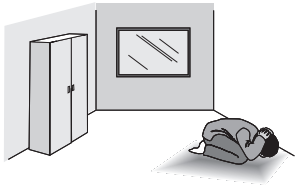
Get Ready

The majority of injuries from an earthquake result from falling debris and failure of infrastructure. Safety precautions that can prevent injury and provide emergency supplies should be put into place prior to an earthquake.

- ☐ Prepare an emergency kit and plan—make sure everyone knows what to do and where to go in case of evacuation.
- ☐ Know how to turn off gas, water and electricity if lines are damaged.
- ☐ Anchor tall, heavy objects (like bookcases) to walls.

During an Earthquake

Knowing how to stay safe during strong shaking can prevent injury. We practiced “drop, cover and hold on” in class. Protecting yourself from falling debris is important.



After the Shaking Stops

When the earthquake is over, there are important safety checks to complete. An emergency kit will ensure access to safe food and water if utilities are damaged during an earthquake. Be sure to:

- ☐ Turn off gas, electric and water if lines are damaged.
- ☐ Look for cracks in walls, and check closets and cupboards for damage and spills. Open doors slowly because objects could tumble off shelves.
- ☐ If you live near the ocean, learn about tsunami warning signs. Head inland and to higher ground if tsunami danger is present.

What if an earthquake happens during school hours?

Your first impulse will be to head to the school to check on the safety and well being of your child. Your child’s safety is our number one priority too! Please note the following:

- ☐ Stay calm! Trust emergency managers. If state and local authorities are asking parents to keep a distance, it is for the safety of everyone. Infrastructure may be compromised, making travel dangerous. You will be notified the very moment it is deemed safe!
- ☐ Keep phone lines open, tune in the local radio and television, and be on alert for information as it becomes available.

Please review the attached booklet, titled “Are you prepared for the next big earthquake in Alaska?” for additional information.