

ShakeOut Activities

Grade Level: 6-8

Purpose: To practice earthquake and tsunami drills. The Shake Out activities (www.shakeout.org) correlate with the annual Shake Out drill in which many California schools and organizations participate in order to be prepared to survive and recover from big earthquakes. Students will also prepare personal earthquake kits and learn about tsunami hazard zones.

Time: 50 minutes(#1-4) to three 50 minute class sessions (steps 5-8)

Educational Standards: (Middle School, MS) STE 8.12, LS1-1, LS2-1, LS2-4, LS2-5, LS2.C, ESS1.C, ESS2.A, MP.4, VPA2.1

Materials:

- Kamome book - The Extraordinary Voyage of Kamome, A Tsunami Boat Comes Home, by Lori Dengler and Amya Miller
- Map or diagram of school evacuation plan (should be posted in classroom)
- Access to a computer with internet access
- world map

Procedure:

1. Prior to an earthquake drill, read pages 1- 10 in The Extraordinary voyage of Kamome to the class.
2. Practice your earthquake drill – Drop, Cover and Hold On – Go to: <https://www.shakeout.org/dropcoverholdon/> for specific steps. This link includes a Resources Section <https://www.shakeout.org/resources/> with guidelines for people with disabilities as well as guidelines for an earthquake event when you cannot get under a table. If in Humboldt County, tune to KHSU on FM 90.5 on day/time of Shakeout Drill. Go to: <https://www.shakeout.org/california/resources/index.html#multimedia> for audio and visual downloads. You can play one of these (download ahead of time) during the Shakeout Drill. Another resource with earthquake sounds is https://www.seismosoc.org/inside/earthquake_sounds/
3. Complete the school evacuation plan for an earthquake and for a tsunami event, if you're in a tsunami zone. Go to: Plan Your Drill at www.shakeout.org
4. After your earthquake drill: complete the group activity, Human Waves Demonstrate How Seismic Waves Travel activity [5-10 min], for a total physical response lesson for students to understand seismic wave motion. Have students physically model and demonstrate a tsunami wave. They will be modeling a P wave to demonstrate the transfer of energy of a tsunami wave across the ocean.

(a) Play the IRIS video “Modeling Seismic Waves” for instructions then guide your students in the activity.

https://www.iris.edu/hq/inclass/video/human_wave_modeling_seismic_waves_in_the_classroom (stop video at 1 min, 25 sec)

5. Guide students to put together a personal kit for an earthquake emergency to keep at school. Send home a list for families to guide/ remind them on earthquake emergency supplies. www.ready.gov/build-a-kit#

6. Complete reading the book, The Extraordinary voyage of Kamome, with the class. (a) Ask students for evidence of a tsunami on the other side of the Pacific Ocean (the physical appearance of the Kamome boat, including the barnacles attached to it, the Japanese characters written on it and how this can be part of evidence of a large event (tsunami) in a far away place (Japan) and a long voyage of the boat over a great distance.) (b) Discuss how barnacles attached to Kamome, or other organisms carried by tsunamis, could impact ecosystems where they may not have been before. What do the barnacles indicate about pelagic (open ocean) life forms? (c) Refer to the map on the inside cover of the Kamome book (or classroom world map) to review where the Japan earthquake occurred and where the Kamome boat was ultimately found.

7. Use the interactive tsunami zone App if you live on the North Coast to locate your address to determine if you live or work in a tsunami zone.

<https://arcg.is/198Kaj>

If you live in other parts of California, use the CalOES My Hazards web site to determine if you are near a tsunami zone.

<http://myhazards.caloes.ca.gov/>

Extension Activities:

1. See page 45 in The Extraordinary voyage of Kamome for suggested activities.

2. Students participate in a ShakeOut flash mob. Go to: <https://m.youtube.com/watch?v=KgxAQnekwA>.

3. Students participate in Pastels On The Plaza in Arcata, California, create a square demonstrating earthquake safety.

Go to: <http://ncsheadstart.org/events/227-2/>

4. The Federal Emergency Management Agency (FEMA) has a couple resources useful to schools too:

- [FEMA 527 – Earthquake Safety Activities for Children and Teachers](#)

- [FEMA P-1000, Safer, Stronger, Smarter: A Guide to Improving School Natural Hazard Safety](#)

5. Students can also work in groups to determine their own walking and running speeds and compare them to the seismic and tsunami and debris traveling speeds calculated in the lesson.

6. For more about faults go to this series of videos to share with your students:
https://www.iris.edu/hq/inclass/video/introductory_earth_earthquakescience_lectures

Select videos by the following titles:

- Earth Vs. the Egg: Measuring Earth's Layers (3 minutes)– This classroom lecture presents a simple conceptual model of the relative thicknesses of the Lithosphere by measuring a simple hard-boiled egg. The hard-boiled egg is used as a scale model for the zones of the Earth. The shell is to the egg as the lithosphere is to the Earth. This demonstration highlights the idea that the lithosphere is a thin shell.

- Tectonic (lithospheric) Plates (2.02 minutes): Commonly confused with crust - This video lecture on four basic types of plate tectonic boundaries: divergent (spreading), transform (strike-slip), and convergent (subduction and continental collision) types of plate boundaries. Clarifies what the tectonic, or lithospheric plates are. Lithospheric plates have two parts consisting of crust and upper mantle. This was recorded at a workshop for middle-school Earth-science teachers in 2006 by Dr. Robert Butler

- Faulting and folding (Foam faults demo) (5.57 minutes)– This video lecture demonstrates the use of foam faults to demonstrate faults, and a deck of cards to demonstrate folds and fabrics in rock layers. Different types of faults include: normal (extensional) faults; reverse or thrust (compressional) faults; and strike-slip (shearing) faults.

Plate Boundaries: Convergent, Divergent, Transform (1.29 minutes) – This Video lecture is on divergent, transform, and convergent types of plate boundaries. Recorded during a 2007 teacher workshop on earthquakes and tectonics. Speaker is Dr. Robert Butler, University of Portland Oregon