Making Community Connections to Co-learn About Earthquakes

Working together to make our communities safer

Many people live in regions prone to earthquakes, tsunamis and volcanic eruptions, but the hazards and risks inherent in our communities may be very different. Making connections with learners from another location is a great way to share knowledge and practice science communication skills. Video conferencing applications like Zoom and Skype make it possible to connect with learners anywhere in the world. This activity provides a simple protocol, and a form for submitting a request to connect with another classroom teacher in the western US.

Essential Questions:
• How does living in earthquake country impact life in your region? In what ways are our ‘lives’ similar and different?
• How can we be more resilient by understanding our tectonic environment, and by making connections with other communities?

Essential Understandings:
• There are similarities and differences between tectonic environments
• In areas that experience earthquakes infrequently, vicarious experience can help motivate preparedness
• Awareness of earthquake impacts can help us plan for a safer home, school and/or community
• Supply chains are interconnected in our global economy

Goals
• Identify similarities and differences between tectonic environments
• Recognize that awareness of earthquake impacts can help us plan for a safer home, school, and/or community
• Understand that we are all vulnerable to disruptions to supply chains that are interconnected in our global economy

Connecting Your Learners
Do you live in an earthquake-prone area? Are you interested in connecting your group of learners to another educator, to co-learn about seismic hazards and preparedness? Submit a request at the following link and we will try to match you with an educator in another region: https://forms.gle/AHzwE6P4Phh3X4Tm6

Materials
• Devices, internet and video conferencing software

NGSS Science Standards
• MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales
• HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity
• MS-ESS3.B Natural Hazards. Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events.
• HS-ESS3.B Natural Hazards. Natural hazards and other geologic events have shaped the course of human history; they have significantly altered the sizes of human populations and have driven human migrations
• HS-ETS-1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants
Background and Teacher Instructions

The Importance of Sharing Experience

Earthquakes are sporadic occurrences, and people have short memories. After a disaster, as people work together to repair the damage, they may notice community vulnerabilities that were exposed. However, as normalcy returns, the motivation to address complex issues and prepare for the next disaster tends to wane. As earthquakes happen around the world, continuing to share experience and lessons learned can help other communities maintain awareness and incentive towards preparedness.

The western United States is exposed to hazards from multiple subduction zones around the Pacific “Ring of Fire.” Being in just about any low-lying coastal area within the Ring of Fire puts you at some risk of experiencing an earthquake and tsunami. Yet different locations have variable risk factors that stem from differences in demographics and societal awareness of the hazards. For example, Anchorage and Portland are both located near subduction zones, but Anchorage experienced a large subduction zone earthquake in 1964, whereas the Pacific Northwest has not experienced a similar subduction zone earthquake since 1700 (ref). While there are still many people in Alaska alive today that lived through and remember the Good Friday earthquake in 1964, multiple generations have passed since a subduction zone earthquake has occurred in Oregon and Washington. As a result, awareness remains low in the general population about the potential for a M8+ earthquake and local tsunami in the Pacific Northwest.

Even in areas that experience disaster events more frequently, there is a tendency to forget quickly. After a natural disaster, anxiety about risk produces a proclivity in people to anchor the disaster in the past to create an illusion of a stable future. This collective minimization of the threat hinders the ability of communities to prepare for the next occurrence.

Interconnected Supply Chains. We all depend on goods and supplies moving around the globe. These supply chains are comprised of boats and planes traveling between ports, and trucks on roads. Many of these ports are located in seismic hazard zones within the Pacific Ring of Fire. If any of these ports become damaged during an earthquake and/or tsunami, local and global supply chains will be affected. For example, the Anchorage airport is the 4th busiest cargo airport in the world, and it sits upon a subduction zone, just a few miles from the epicenter of the 1964 M9.2 Good Friday earthquake. The Alaskan supply chain depends heavily on goods coming from the port of Seattle, which is also located within a subduction zone.

What to Discuss with Co-Facilitating Teacher

Prior to scheduling video-conferences between classrooms, co-facilitating teachers should discuss and decide a few things about how the sharing will proceed.

Delivery Models

Model (1): the classes participate in a parallel fashion, trading off in presenting similar depth of information.

Model (2): one class develops content to teach the other class. For example, each student in one class creates a book or video for each of the students in the other class to read or watch, or the best books and videos submitted by one class are used to teach a lesson in whole group to the other class.

To determine which model to use, consider the relative age difference of the classes, the timing at which the classes are learning the information, and/or the depth to which content is covered in the unit. If these factors are more or less equal between the two learner groups, use delivery model 1. Use delivery model 2 if the age of the two classes is more than one grade level different, or if the unit is completed by one class weeks to months ahead of the other class. Model 2 is also recommended if one of the classes has gone more in depth during the learning cycle, and/or if the students have a greater depth of prior knowledge for any reason.

Timing and commitment

Will all students present, or will selected students or groups be the “spokespersons.” How would the spokespersons be determined? Is the sharing going to be conducted in a single class period, or several class periods, or will it be ongoing? Is there a time difference between the two classrooms?

Content

If the two classes are similar in age, timing and knowledge, you may decide to use delivery Model 1 above, sharing results from the same activity (for example, the Geologic Hazards Community Action Plan).

Alternatively, each class could focus on different activities. For example, following delivery Model 2, an 8th grade class that has conducted the activity Geologic Hazards and the Built Environment could create booklets about various seismic retrofitting techniques for younger kids to use while they are learning about seismic structural reinforcement by doing the activity Build a Better Wall.

Co-facilitating teachers should agree upon the specific desired learning outcomes, which may be different for the two classes.