

EDUCATION ABOUT ASIA

Discover a World of Information on Asia!

Environmental Challenges and Asia

Mapping the Ring of Fire

Paul Tankovich
Earth Science, Physical Science
Ridgetop Junior High School
Silverdale, WA

General Online Resources	Mount Rainier National Park website Mount Rainier For Teachers
Overview	This activity will help students orient themselves geographically to the regions in the Sister Mountain Project. Students identify continents, bodies of water, countries, and plate boundaries to become familiar with Pacific Rim/Ring of Fire geography. As students work through other curriculum activities, they may want to refer back to their map as a reminder.
Grade Level	Six through nine
Objectives	Students will be able to <ul style="list-style-type: none">• Use resources to locate geographical information.• Draw boundaries on a map.• Identify important Pacific Rim countries, bodies of water, and tectonic structures.
Setting	Classroom, Library or Computer Lab
Time Frame	Two fifty-minute class periods
Materials	Student handouts <ul style="list-style-type: none">• Pacific Rim Outline Map• Mapping the Ring of Fire instruction sheet.• Atlases, plate tectonic maps, computers with Internet access.• Colored pencils or markers.• Power Point viewing capability or Internet access.

<p>Vocabulary</p>	<p>Continent—one of the seven large landmasses on the Earth’s surface.</p> <p>Mid ocean ridge—a submarine mountain range where sea floor spreading is occurring—usually located on a divergent plate boundary.</p> <p>Plate boundary—a line on a map that defines the edge of a tectonic plate usually indicating where one plate is in contact with another. Plate boundaries are further divided by the direction that they are moving in reference to one another. When plates are moving towards one another it is called a convergent plate boundary. When plates are moving away from each other it is called a divergent plate boundary, and when plates are sliding past each other horizontally it is called a transform plate boundary.</p> <p>Political boundary—a line on a map that confines or limits the jurisdiction of a ruling body</p> <p>Trench—a long, steep-sided furrow in the ocean floor formed when one tectonic plate is a long, steep sided furrow in the ocean floor formed when one tectonic plate is subducted beneath another tectonic plate. Notable trenches include the Cascadia trench, Tongan trench, and Mariana Trench.</p> <p>Subduction—A geologic process in which the edge of one crustal plate is forced below the edge of another. As it descends, the plate often generates seismic and volcanic activity (from melting and upward migration of magma) in the overriding plate.</p>
<p>Standards</p>	<p>Social Studies 3.3.1 3.1 Understands the physical characteristics, cultural characteristics, and location of places, regions, and spatial patterns on the Earth’s surface.</p> <p>Science Grades six through eight, ES2F Describe what may happen when plate boundaries meet (e.g., earthquakes, tsunami, faults, mountain building) with examples from the Pacific Northwest.</p>
<p>Background</p>	<p>The Pacific Rim is a conglomeration of Pacific Ocean border countries including Australia, Peru, Argentina, China, Russia, Japan, Canada, and the United States, each with its own economic, geographic, political, environmental, and cultural background. The countries of the Pacific Rim have a rich history of interconnected trade, travel, and geologic processes known as the Ring of Fire.</p>
<p>Procedure</p>	<p>Part 1</p> <ol style="list-style-type: none"> 1. Introduce the Pacific Rim and the interconnections and similarities of people living in the Pacific Rim. 2. Hand out a copy of the Pacific Rim map to students. Review reading a map and using latitude and longitude to identify locations. 3. Distribute “Mapping the Ring of Fire” (part 1) handout and review instructions with students. 4. Students use a variety of resources such as atlases, encyclopedia, plate tectonic maps, and the Internet to locate and label each item on the list. <p>Part 2</p> <ol style="list-style-type: none"> 1. Review the students’ maps with the locations from part one identified. 2. Give students the handout “Mapping the Ring of Fire” (part two). 3. View slideshow with seismic maps of the Pacific Rim. During the slideshow pause

	<p>and allow students to sketch inferences on their map when viewing the maps of seismic data from the Pacific Northwest, Southeast Asia, and the Pacific Rim.</p> <ol style="list-style-type: none"> 4. Pause, and ask students to complete questions from the slideshow in their journals, notebooks, or printed work sheets. 5. Have students draw in the plate boundaries of the plates located beneath the Pacific Ocean. Review completed maps as a class or check them as a formative assessment. <p><i>Have students keep their maps to use as a reference as they work through activities in the Mount Rainier-Mount Fuji Sister Mountain Project.</i></p>
<p>Adaptations</p>	<p>Students may work in small groups or with partners to complete their maps or they can complete what they know individually and then compare their maps with a partner/small group to fill in missing information.</p> <p>Enlarge map to 11" X 14" to allow more room for labeling. Another alternative is to project the map on a screen or whiteboard and label as a class activity.</p> <p>This activity can be made more competitive by having students form teams and race against each other to finish labeling their map.</p>
<p>Extensions</p>	<ol style="list-style-type: none"> 1. Add plate and political boundaries before making copies. Edit the list as needed to support the student objectives. 2. Copy a classroom sized map by printing a blank map onto a transparency, blowing it up by overhead, and copying it onto butcher paper. Students can work together researching the list and adding information to the map. 3. To break the activity into smaller chunks, edit the list of labels to reflect a more focused purpose of the mapping exercise. Add different components at different times in the unit, or use additional copies of the map for different topics such as wind belts, ocean currents, and tectonic plates. 4. Students can color code divergent, convergent, and transform plate boundaries, ocean currents, global wind belts, etc. 5. Use an alternate source of seismic data than the maps from the slide show for students to construct their inferences for plate boundaries: Software (Seismic/Eruption) that plots data through time on various maps available from IRIS. The last month's worth of earthquake data. 6. Students can add rivers, cities, biomes, climate zones, and other such information to their maps.
<p>References/ Resources</p>	<p>About.com: Geography. Countries of the Pacific Rim. Cascades Volcano Observatory. Plate Tectonics and Sea-Floor Spreading Maps and Graphics, etc. United States Geological Survey. Kious, W. and Tilling, R. (1996). This Dynamic Earth: The Story of Plate Tectonics. United States Geological Survey.</p>

	<p>Shedlock, K. and Pakiser, C. (1997) Earthquakes. United States Geological Survey.</p> <p>Simkin, T., Tilling, R., Vogt, P., Kirby S., Kimberly, P., and Stewart, D.(2006) Geologic investigations map I-2800: This dynamic planet (third edition). United States Geological Survey.</p> <p>United States Geological Survey. Understanding Plate Motions.</p> <p>United States Geological Survey. Earthquake Hazards Program: Earthquake Center.</p>
<p>Assessment</p>	<p>Construct a simple quiz by placing numbers on a blank copy of the map. Students then identify each numbered feature on the map.</p>