Earthquakes in Ohio? Earthquake Risk in the U.S.

Students learn how to make conjectures from occurrence and risk maps of earthquakes in the United States.

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**Grade Level**  
4 and 6

**Duration**  
1 class period

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**National Geography Standards**

**ELEMENT ONE: THE WORLD IN SPATIAL TERMS**

1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

**ESSENTIAL ELEMENT THREE: PHYSICAL SYSTEMS**

7. The physical processes that shape the patterns of Earth's surface.

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**Arizona Geography Strand**

**CONCEPT 1**  
World in Spatial Terms  
GRADE 4

PO 2. Interpret political and physical maps using the following map elements: c. symbols

Grade 6

PO 3. Interpret maps, charts, and geographic databases using geographic information.

PO 5. Interpret thematic maps, graphs, charts, and databases depicting various aspects of world regions.

**CONCEPT 3**  
Physical Systems  
Science Strand 6 Concept 2  
GRADE 4

Understand processes acting on the earth (erosion, floods, earthquakes, volcanoes, forest fires) and evidence of their occurrence.

**CONCEPT 5**  
Environment and Society  
GRADE 4

PO 2. Describe the impact of extreme natural events on human physical environments.

**Concept 6: Geographic Applications**  
Grade 6

PO 1. Describe ways geographic features and conditions influenced settlement in various locations (e.g., near waterways, on high terrain, with adequate fresh water, on good land for farming, in temperate climates) throughout different periods of time, places, and regions.

PO 2. Use geographic knowledge and skills (e.g., recognizing patterns,

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**Other Arizona Standards**

**Mathematics Common Core Standards**

**Number and Operations—Fractions**

4.NF.C.6. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

4.NF.C.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

**The Number System**

6.NS.C.9. Convert between expressions for positive rational numbers, including fractions, decimals, and percents.
Overview
This lesson uses different maps to help students understand where earthquakes have occurred and how we can generalize trends to predict risk areas where earthquakes are likely to occur again.

Purpose
In this lesson students will gain a better understanding of how data and data mapping allow us to make predictions and create trends of occurrence.

Materials
- Teacher Directions
- Lab Sheet and Answer Key
- Rubric for Grading Lab Sheet
- Earthquakes in Ohio? Earthquake Risk in the U.S. map
- Seismicity of the United States 1977-1991 map
- Earthquake Facts
- Calculators (optional)

Objectives
The student will be able to:

1. Identify a relationship between data and mapping.
2. Organize information from a map into a table.
3. Determine trends pertaining to earthquakes in the United States, regions, and/or individual states.

Procedures
*Students should have experience with fractions and converting fractions to percents.*

1. Use the Teacher Directions to discuss earthquakes and discuss the maps in general.
2. Have the students complete the Lab sheet
3. Use the Earthquake Fact sheet at the end for closure.

Assessment
Geography Assessment: Use Rubric for Grading Lab Sheet to score student work. Grade questions 1, 2, and 5 for geography. Mastery is 75% or higher.

Math Assessment: Use Rubric for Grading Lab Sheet to score student work. Grade questions 3 and 4 for math. Mastery is considered 100%.

Extension
Students can research current data for their state to see if earthquake norms are increasing or decreasing.

Sources
A special thanks to Kay McClain, Vanderbilt University

U.S. Geological Survey websites
Maps of US that show earthquakes and their dates

List of the largest US earthquakes