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: 4-5
Duration: 1 class period

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.

Arizona Geography Strand 4

CONCEPT 1
World in Spatial Terms
GRADE 4
PO 2 Interpret political and physical maps using the following map elements:
c. symbols
GRADE 5
PO 1 Interpreting information from a variety of maps: contour, population, natural resources and historical maps.

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.

Arizona Math Standard

STRAND 1 Number Sense and Operations
CONCEPT 1 Number Sense
GRADE 4
PO 4 Compare and order decimals to hundredths.
GRADE 5
PO 1 Determine equivalence by converting between benchmark fractions, decimals, and percents.

STRAND 2 Data Analysis, Probability, and Discrete Math
CONCEPT 1 Data Analysis
GRADE 4
PO 2 Formulate and answer questions by interpreting and analyzing displays of data, including double bar graphs, single line graphs, or circle graphs.
GRADE 5
PO 2 Formulate and answer questions by interpreting and analyzing displays of data, including multi-bar graphs or double line graphs.

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

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**
- Earthquake in Ohio Lab Sheet
- Earthquakes in Ohio? Lab Sheet -- *Answer Key*
- Earthquakes in Ohio? Lab Sheet – Rubric for Grading
- Earthquake in Ohio? Teacher Directions and Lesson
- Earthquakes in Ohio? Earthquake Risk in the U.S. map
- Seismicity of the United States 1977-1991 map
- Earthquake Facts
- Paper, pencil
- 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 Earthquake in Ohio Teacher Directions and Lesson to discuss earthquakes and discuss the maps in general.

2. Have the students complete the Lab sheet

3. Use the Earthquake Fact sheet for beginning the lesson (alternate set) or at the end for closure.

**Assessment**
Use the Earthquakes in Ohio? Lab sheet – Rubric for Grading the Lab sheet. Geography assessment – questions 1, 2, and 5. Mastery is 75% or higher. Math assessment – questions 3 and 4. Mastery is considered 100%.

**Sources**
A special thanks to Kay McClain, Vanderbilt University

U.S. Geological Society
http://earthquake.usgs.gov/4teachers/

U.S. Geological Society Maps
http://earthquake.usgs.gov/

Free maps and materials
http://earthquake.usgs.gov/