

Geologic Maps & Earthquakes

You can find out a great deal of information from geologic maps — from the types of rocks that make up a rock unit to the age of those rocks and the angle at which the rock bed is tilted. By identifying fractures and fracture zones in rock, geologic maps can even tell you where known faults are located.

Geologic maps are very colorful, and each color is linked to the types and ages of rock units. The legend included with each geologic map tells you what each color means. The legend also tells you, with the use of lines and arrows, where faults are located and, for strike-slip faults, in which relative direction they are moving.

This activity is designed to give you practice using a geologic map to assess the likelihood and location of a particular natural hazard — earthquakes — in California.

Materials

- Simplified Geologic Map of California
- Historical Earthquake Map of California
- Notebook
- Pen

Procedure:

- 1. Look carefully at the geologic map of California. Use the legend to understand the information about rocks and faults on the map. Where are the oldest rocks in California? The youngest?
- 2. Locate faults on the map. Are the faults evenly distributed throughout the state, or do they appear to be grouped in some ways? Do the faults seem to be located in areas with particular landforms? If so, how might you explain that?
- 3. Now, look at the earthquake map of California. What relationships do you observe between the features in the geologic map and where most of the earthquakes have occurred? Record your observations in your notebook.
- 4. Earthquakes happen when stresses build up between rock layers. Eventually, when the stress is great enough, the rock layers suddenly slip along a fault. This motion, the earthquake, releases huge amounts of energy in all directions.
- 5. If you were going to build a community in an area of California where earthquakes are least likely to occur, where would you do this? Write your reasons for why you would plan your community in this place.
- 6. Where in California are places highly likely to experience earthquakes? What is your evidence for that?
- 7. Online, investigate some of the largest earthquakes California has had in the past 150 years. How are these earthquakes related to faults?
- 8. Investigate potential hazards in your state by going online to http://ngmdb.usgs.gov/ (especially to the Map Catalog and Mapview). Another good source of information are the state geological surveys, at http://www.stategeologists.org/. Search for maps of your area. Study the map's geologic patterns and the legend and note what hazards are identified. Are there landslide deposits? Sinkholes? Volcanoes? Others?
- 9. Now, investigate the geology in several national parks. Go to <u>go.nps.gov/geomaps</u> for a geologic map activity on different geologic hazards in national parks. Are there hazards present? What kind?











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