

Strand: 8.4	Standard: 8.4.5	Episode 2	Big Idea: There are patterns in the occurrences of natural hazards and these patterns can be used to predict future catastrophic events.
--------------------	------------------------	-----------	---

Title: Patterns in the occurrences of natural hazards	Time: 30 minutes	CCCs: <u>Patterns</u>	Practices: Analyzing and Interpreting Data
--	-------------------------	--------------------------	--

Episode Snapshot

In this episode the students will map the locations of recent occurrences of a hazard faced by the US. They will then look for patterns in the occurrences of this hazard then **analyze and interpret** these patterns to make predictions for where this hazard might occur in the future.

Gather

When scientists are determining the risk of a hazard occurring in an area, they will look at past events and use the data they provide to predict future events. This activity will provide students with experience of this process. They will be mapping recent earthquakes in the US and using that map to look for patterns and make some predictions about where earthquakes might occur in the future.

Provide each student with a blank map of the United States that includes latitude and longitude lines. Use [this website](#) or [this one](#) to compile a list of cities in the US that have experienced an earthquake in the two weeks prior to teaching this episode. Without telling the students what the cities have in common, give each student the name of one or two of these cities printed on a piece of paper. Each student will look up the location of their city, then mark it on a large US map you have posted in the room using sticky notes or removable stickers. Ask students to record the locations of these cities on their blank map. They will look at the class map and record any patterns they see on the back of their map.

Reason

Discuss the patterns the students observed with the class. Ask them if they can guess what all of the cities have in common. There will usually be a few students by this point who have figured out that it has something to do with earthquakes. If not, inform the students that they have created a map that shows *specific earthquake events* in the US over the last two weeks. Ask the students to use the map they have created to predict where earthquakes might happen in the US in the future. Is Utah at risk?

Students will now draw lines around the regions that they believe are most prone to earthquakes in the US. By doing this they will create an *earthquake hazard map*. Consider asking them to create a color key that shows where high concentrations of stickers are vs. low concentrations or no stickers and explain what this has to do with earthquake hazards.

At this point show the students a website that maps recent earthquake activity in Utah, such as [this one](#). This will show them how these maps can be generated easily by computers, and also that earthquakes happen frequently in Utah.

You may also show them other maps of specific hazard events and compare them with their hazard risk maps; for example, show a map of tornado tracks in the US and compare it with a tornado hazard map. See [this document](#) for examples.

Communicate

Provide each group of students with an official earthquake hazard map for the US and ask them to compare it to all the hazard maps made by their group. As a group discuss the following ideas:

- How similar are the student's maps to the official map?
- Are there earthquake hazard regions on the official map where you had no earthquakes on yours?
- Why do you think some areas have many earthquakes while others have none?

Assessment: Ask the students to answer the following question in their notebooks: What would a scientist need to do to create a map that shows the areas in a country that have a high risk of experiencing a tornado in the future? Students should be able to say that the scientists would use graphs, charts, and data on the locations and sizes of past tornadoes to look for patterns in their occurrences. They would create a hazard map that shows areas of highest risk based on where the most tornadoes have occurred in the past.	Materials, resources, handouts, etc: • A list of US cities that have experienced an earthquake in the previous 2 weeks using the following websites: ◦ http://ds.iris.edu/sm2/eventlist/ ◦ https://www.emsc-csem.org/Earthquake/?filter=yes ◦ https://earthquake.usgs.gov/earthquakes/map/ • Recent earthquake activity in Utah https://earthquaketrack.com/r/utah/recent • Small sticky notes or removable stickers • A large map of the US • Blank US latitude and longitude map • Colored pencils • Natural Hazards General Information
--	---