

Name _____

PREDICTING NATURAL DISASTERS

Directions: Read the information below.

Predicting Volcanic Eruptions and Earthquakes

Have you ever visited Hawaii's Volcanoes National Park? It's not like the park you have in your neighborhood. This park is created around a volcano and has places for people to walk or camp. While the park area around the volcano is safe for visitors, geologists (scientists who study the earth) are working to monitor conditions around the site to ensure there is no impending eruption. Some events, like volcanic eruptions, can be predicted. Others, like earthquakes, cannot.

Geologists are working to develop precise technologies that will allow for the accurate prediction of volcanic eruptions. One method is measuring a gas called sulfur dioxide. This can be measured directly by taking samples or remotely using technology. It is believed that as a volcano gets closer to erupting, the level of sulfur dioxide it emits will increase. Earthquakes can also happen before an eruption. Mount Pinatubo in the Philippines erupted on June 15, 1991, and is one example of this. During the two months leading up to the eruption, the area experienced many small earthquakes. Developing an accurate prediction model quickly can be difficult because volcanoes usually go hundreds of years or longer without erupting.

Although earthquakes may be precursors to volcanic eruptions, we cannot predict earthquakes. They happen without warning and can cause extreme devastation depending on their strength. Of course, geologists are working to find methods of predicting earthquakes. The United States Geological Survey reports that one reliable method is looking at the past history of earthquakes. In general, areas that experienced more earthquakes in the past are more likely to have them in the future. The organization also explains that measuring the strain put on rocks (caused when the plates under the surface of the earth move) is another way to predict the quakes. Other scientists believe that if an earthquake is near, the surface of the earth will emit a gas called radon. A more direct method, according to some, is using a seismometer to measure vibrations in the earth. Despite these methods, nobody can accurately predict the timing of an earthquake. Some quakes occur seemingly randomly without warning.

Earthquakes are measured by the momentum magnitude scale. There are no lower or upper limits for this scale, but most earthquakes measure between a 2.5 to an 8.0 rating. Earthquakes at a 2.5 are very small and may not even be felt. Earthquakes that measure at 8.0 are very strong and could cause devastating damage. A 1960 earthquake in Chile is one of the strongest on record; it was measured at a magnitude of 9.5 and killed more than 1,000 people.

Directions: Use the table below to answer the questions.

Earthquake Counts by State 2010-2015 (M3+)

Counts are as of March 10, 2016

State	2010	2011	2012	2013	2014	2015
Alabama	1	1	0	0	2	6
Alaska	2245	1409	1166	1329	1296	1575
Arizona	6	7	4	3	31	10
Arkansas	15	44	4	4	1	0
California	15	44	4	4	1	0
Colorado	4	23	7	2	13	7
Connecticut	0	0	0	0	0	1
Delaware	0	0	0	0	0	0
Florida	0	0	0	0	0	0
Georgia	0	0	0	0	0	0
Hawaii	17	34	40	30	26	53
Idaho	1	0	2	1	0	1
Illinois	1	0	2	1	0	1
Indiana	1	0	3	0	0	0
Iowa	0	0	0	0	0	0
Kansas	0	0	0	2	42	60
Kentucky	0	0	2	0	0	0
Louisiana	1	0	1	1	0	0
Maine	1	0	1	1	0	0
Maryland	1	0	0	0	0	0
Massachusetts	0	0	0	0	0	0
Michigan	0	0	0	0	0	2
Minnesota	0	0	0	0	1	0
Mississippi	0	0	0	0	0	3
Missouri	2	3	2	0	1	5

State	2010	2011	2012	2013	2014	2015
Montana	7	11	9	14	29	19
Nebraska	2	0	1	0	0	3
Nevada	38	86	22	34	161	172
New Hampshire	1	0	0	0	0	0
New Jersey	0	0	0	0	0	0
New Mexico	7	7	3	6	3	12
New York	0	1	0	0	0	2
North Carolina	0	0	0	0	1	0
North Dakota	0	0	1	0	0	0
Ohio	1	3	0	1	1	0
Oklahoma	41	63	34	103	585	888
Oregon	4	0	4	2	4	3
Pennsylvania	0	0	0	0	0	0
Rhode Island	0	0	0	0	0	0
South Carolina	0	0	0	0	3	0
South Dakota	0	3	1	1	1	0
Tennessee	1	0	4	1	1	1
Texas	9	18	11	16	8	21
Utah	17	16	16	6	10	4
Vermont	0	0	0	0	0	0
Virginia	1	7	4	0	1	0
Washington	5	14	6	18	6	11
West Virginia	1	0	0	1	0	0
Wisconsin	0	0	0	0	0	0
Wyoming	43	6	9	73	179	198

*Source: <https://earthquake.usgs.gov/earthquakes/browse/stats.php>

1. How many states experienced over 100 earthquakes in 2015?
2. Which state in the United States has the greatest probability for an earthquake? Write the evidence you have for this prediction.
3. If you wanted to live in a state with a low probability of a volcanic eruption, which state might you choose and why? (Hint: there is more than one possible answer.)
4. Look at the data for Wyoming. Based on the historical data, would you consider an earthquake there probable? Why or why not?