

MIDDLE SCHOOL EARTHQUAKE INVESTIGATION

- **Access resources:** Click the link in the heading below then click “pdf” in the first box (Teachable Moment presentations) and the link for “Earthquake Browser.”
- Explore the resources and answer the questions below.

1. Event Basic Information: Use the slides		
Question	M 7.0 California	M 7.1 Japan
a. What is the basic information scientists use to describe this earthquake? It is on every slide.	1. 2. 3. 4.	1. 2. 3. 4.
b. Where was the epicenter location for this earthquake?		
c. Where was the hypocenter location for this earthquake?		
d. What is the highest Modified-Mercalli Intensity for the earthquake?		
e. Which tectonic plates are most involved?		
2. Seismic Patterns: Use the Interactive Earthquake Browser (IEB) to explore earthquakes in the same region.		
a. Where do earthquakes cluster in this region?		
b. What patterns, such as lines, arcs, or clusters, do you see?		
c. Are earthquakes occurring at different depths? (yes or no)		
d. Which type of boundary is nearest to this region?		
e. What additional information do scientists include in the earthquake's story?		

MIDDLE SCHOOL EARTHQUAKE INVESTIGATION - ANSWER KEY

***Bold terms** are where you can bring in the review of the Key definitions when you go over the Answers to the worksheet.

1. Event Basic Information: Use the slides		
Question	<u>M 7.0 California</u>	<u>M 7.1 Japan</u>
a. What is the basic information scientists use to describe this earthquake? It is on every slide.	1. Magnitude 7.0 2. Location - Mendocino, CA 3. Date - Thursday, Dec 5, 2024 4. Time - 18:44:19 UTC	1. Magnitude 7.1 2. Location - Japan 3. Date - Thursday, Aug 8, 2024 4. Time - 7:42:55 UTC
b. Where was the epicenter location for this earthquake?	Latitude 40.370° N Longitude 125.025° W	Latitude 31.719° N Longitude 131.527° E
c. Where was the hypocenter location for this earthquake?	Latitude 40.370° N Longitude 125.025° W Depth 0.6 km	Latitude 31.719° N Longitude 131.527° E Depth 25.0 km
d. What is the highest Modified-Mercalli Intensity for the earthquake?	VIII - Severe	VII - Very strong
e. Which tectonic plates are most involved?	North American Plate and the Pacific Plate	Eurasian Plate and the Philippine Sea Plate
2. Seismic Patterns: Use the Interactive Earthquake Browser (IEB) to explore earthquakes in the same region.		
a. Where do earthquakes cluster in this region?	On boundaries	On boundaries
b. What patterns, such as lines, arcs, or clusters, do you see?	Lines	Arcs
c. Are earthquakes occurring at different depths? (yes or no)	Yes	Yes
d. Which type of boundary is nearest to this region?	Transform/strike-slip. Some students might say convergent/ subduction due to proximity.	Subduction
e. What additional information do scientists include in the earthquake's story?	General information about the area, the seismicity/earthquake history, plate tectonics, any other natural hazard that could be triggered by the earthquake, the amount of damage done, the impact on the people, seismogram and the information from it.	

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b. Where was the epicenter location for this earthquake?		
c. Where was the hypocenter location for this earthquake?		
d. What is the magnitude for the earthquake?		
2. Seismic Patterns: Use the Interactive Earthquake Browser (IEB) to explore earthquakes in the same region.		
a. What do you notice about the magnitudes and depths of the earthquakes that cluster in this region?		
b. What patterns, such as lines, arcs, or clusters, do you see?		
c. Which type of boundary is nearest to this region?		
d. Between these two earthquakes, which boundary would you expect to cause a larger earthquake?		
e. Why? - talk about the differences in how stress accumulates.		
f. What additional information do scientists include in the earthquake's story?		

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c. Where was the hypocenter location for this earthquake?	Latitude 40.370° N Longitude 125.025° W Depth 0.6 km	Latitude 31.719° N Longitude 131.527° E Depth 25.0 km
d. What is the magnitude for the earthquake?	M 7.0	M 7.1
2. Seismic Patterns: Use the Interactive Earthquake Browser (IEB) to explore earthquakes in the same region.		
a. What do you notice about the magnitudes and depths of the earthquakes that cluster in this region? (seismicity)	<i>On boundaries</i>	<i>On boundaries Deeper earthquakes</i>
b. What patterns, such as lines, arcs, or clusters, do you see? (seismicity)	<i>Lines</i>	<i>Arcs</i>
c. Which type of boundary is nearest to this region? (plate tectonics & boundary types)	<i>Transform/strike-slip. Some students might say convergent/subduction due to proximity.</i>	<i>Subduction</i>
d. Between these two earthquakes, which boundary would you expect to cause a larger earthquake?	<i>Subduction zone</i>	
e. Why? - talk about the differences in how stress accumulates.	<i>Subduction zones: Direct collision between massive tectonic plates. Transform boundaries: boundaries slide horizontally producing shear stresses.</i>	
f. What additional information do scientists include in the earthquake's story?	<i>General information about the area, the seismicity/earthquake history, plate tectonics, intensity, any other natural hazard that could be triggered by the earthquake, the amount of damage done, the impact on the people, seismogram and the information from it.</i>	