



Exploring Earthquakes

Student Pack

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Earthquakes K-W-L Chart



Directions: Fill in the “K” and “W” sections of the K-W-L chart by telling what you already know about earthquakes and what you want to learn about them.

K What I Know About Earthquakes	W What I Want to Learn About Earthquakes	L What I Learned About Earthquakes

Name Date

Milestone #1 Inquiry Question



Directions: Use what you learned in this milestone to answer the question.

What is one thing you want to learn about earthquakes? Why do you want to learn that?

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How to Do Good Research



Follow these steps when you are doing research in a book.

1. Choose a book about your topic.
2. Use the table of contents to find the chapter that has information about the question you are trying to answer.
3. Go to that chapter and read until you find the information you need. Put the answer in your own words. You can't just copy what the author wrote. This is called plagiarism, and it can get you in trouble
4. Go back to the table of contents and find the chapter that will answer your next question.
5. Repeat these steps until you find all the answers you need.

Follow these steps when you are doing research online.

1. Open your search engine and type in your keywords. These should be as specific as possible. For example, type in the specific place your earthquake occurred instead of the word "earthquakes". You can also add the words "for kids" to your keyword (ex. Gorkha earthquake facts for kids). This will give you articles that are easier to read.
2. Click on the top link. Read the article and look for useful information to answer your questions.
3. When you find an answer, put the information in your own words. You can't just copy what the author wrote. This is called plagiarism, and it can get you in trouble.
4. Keep reading the first website to find more information you need.
5. When you get to the end of the article, click the back arrow to go back to your search results. Click on the second article and read it to find the answers to more of your questions.
6. Repeat these steps until you find all of the answers you need.

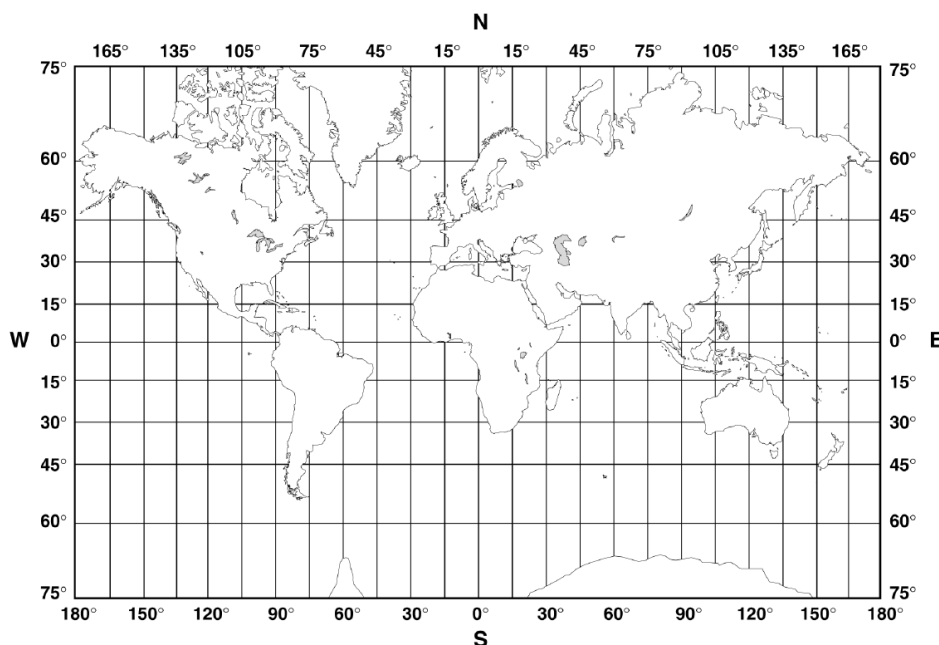
Plate Tectonics and Earthquakes



Part A: The movement of tectonic plates along boundaries can cause earthquakes. Using reference materials, find ten places in which earthquakes have occurred during the past 25 years. Fill in the latitude and longitude of each location in the table below.

Earthquake Locations				
	Earthquake	Latitude	Longitude	Tectonic Plates
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Part B: Plot each of the earthquakes listed in your table on the world map below. Determine which tectonic plates moved to cause the earthquake. Fill in the tectonic plates in the above table.



Earthquake Magnitude Matching



Directions: Write the correct letters on the lines to match each earthquake with its magnitude. Use the Australian Geographic website to help you.

- | | |
|---|--------|
| Valdivia, Chile - May 22, 1960 | a. 8.6 |
| Prince William Sound, Alaska - March 28, 1964 | b. 8.8 |
| Sumatra, Indonesia - December 26, 2004 | c. 9.0 |
| Sendai, Japan - March 11, 2011 | d. 9.2 |
| Kamchatka, Russia - November 4, 1952 | e. 8.6 |
| Bio-bio, Chile - February 27, 2010 | f. 9.5 |
| Ecuador Coast - January 31, 1906 | g. 9.0 |
| Rat Islands, Alaska - April 2, 1965 | h. 8.8 |
| Sumatra, Indonesia - March 28, 2005 | i. 9.1 |
| Assam, Tibet - August 15, 1950 | j. 8.7 |



Name

Date

Earthquake Research



Directions: Choose an earthquake to research. Use books and websites to gather facts about it, and fill in the chart below.

Location of the Earthquake	Magnitude of the Earthquake	Date and Time the Earthquake Occurred	Number of People Killed and Injured
Damage Done by the Earthquake	Epicenter Information		Aftershock Information
Cause of the Earthquake			
Tectonic Plates Involved	Other Effects of the Earthquake (landslides, tsunamis, etc.)		
Cost of Damage and Disaster Relief	Groups That Helped with Disaster Relief		
Other Important Facts			

Name Date

Milestone #2 Inquiry Question



Directions: Use what you learned in this milestone to answer the question.

What is one way the earthquake you researched is like the Gorkha earthquake? What is one way the two earthquakes are different?

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Earthquake!



San Francisco was a booming and prosperous port town in 1906, but at 5:13 a.m. on April 18, all that changed. A massive earthquake struck the city and surrounding area. Fires broke out throughout the city due to severed electric lines, overturned lamps, and the explosion of gas mains. Even worse, the city's water mains were also damaged, retarding the firefighters' ability to fight the raging flames. For three days the flames spread, largely unchecked. Finally, firefighters began dynamiting blocks of buildings just to stop the fire from spreading. When the damage was assessed, 3,000 lives had been lost, 250,000 people were homeless, and more than 28,000 buildings were destroyed. Damage to property was in excess of 500 million dollars.

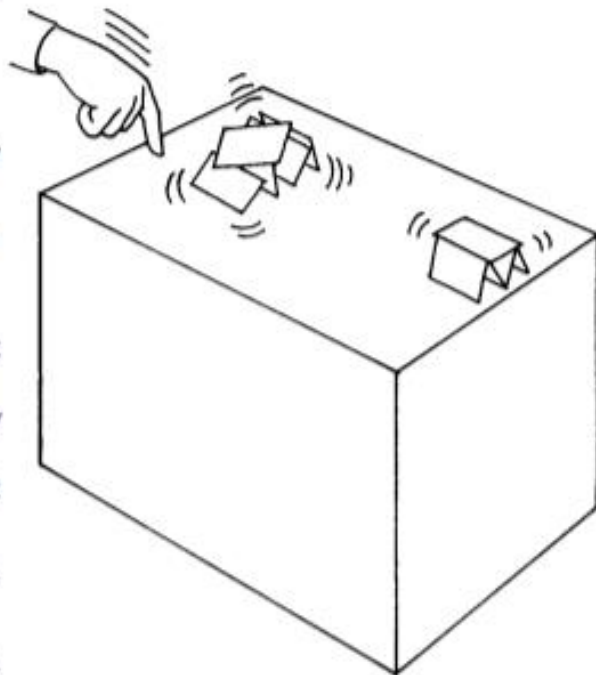
A strong earthquake struck the city again in 1989; however, this time only twelve lives were lost. The difference was largely due to architectural and technological advances that have made newer buildings better able to withstand powerful earthquakes.

To learn more about some kinds of earthquakes, try the experiments below.

Materials: cardboard box, metal pan, uncooked beans or rice, deck of cards, dominoes, building blocks

Procedure:

1. Begin with the cardboard box. Turn it upside down. Build two small houses of cards, one near the edge of the box and one further away.
2. Tap your fingers gently eight to ten times on the box in front of the closest house. Watch the movement of both houses. You should see that the house closest to the tapping receives the most damage, although the walls of both houses will shift position. The different effects are caused by waves of energy sent by the tapping (earthquake). The vibrating energy weakens as it travels.
3. Repeat the experiment, this time with two houses of dominoes. Watch the results.
4. Repeat it once more, this time with block houses. Again, watch the results. The three kinds of structures will show the ability of structures to withstand earthquakes.
5. If desired, the three different housing materials can be built on different surfaces and the experiment repeated. This will show how the various surfaces alter the effects of the quake's energy waves. After the cardboard box, try an overturned metal pan. Next, invert the pan and fill it with dry rice or beans, and then build the structures on them. What happens in each scenario?



The Future of Earthquake-Proof Buildings



Directions: Watch the video and take notes about 3 different ways architects are keeping buildings safe from earthquakes. You will need your notes for the next part of the project.

Damage-Prevention Method #1	
Damage-Prevention Method #2	
Damage-Prevention Method #3	

Earthquake-Proof House Planner



Directions: Pretend you lived in the place where the earthquake you researched occurred. Create a house that wouldn't be destroyed during the earthquake. Answer these questions to plan your earthquake-proof house.

1. What materials would you use to build your earthquake-safe house? What supplies will you use to represent those materials in your model?

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2. Where would you build your house? What type of ground would it be on? Why? Use what you learned in the experiment to support your answer.

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3. What special earthquake-proof features would your house have? Use an idea from the video to keep your house safe during the earthquake. How will you represent this in your model?

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Name Date

Earthquake-Proof House Design



Directions: Use this page to sketch a picture of your earthquake-proof house. Label it with the names of the materials you will use to make each part.

Name Date

Milestone #3 Inquiry Question



Directions: Use what you learned in this milestone to answer the question.

Do you think the house you live in would survive an earthquake? Why or why not?

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Name

Date

Earthquake Safety Tips



Directions: Watch the video. List the things you should do in an earthquake in the “DO” box and the things you shouldn’t do in the “DON’T” box.

DO

DON'T

Name Date

Milestone #4 Inquiry Question



Directions: Use what you learned from this milestone to answer the question.

How would you stay safe during an earthquake? Tell at least 3 things you would do.

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Name

Date

Earthquake Relief Efforts



Directions: Watch the video about the relief efforts after an earthquake in Haiti. Answer the questions in complete sentences.

What damage did the Haiti earthquake do?

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How were people in Haiti helping after the earthquake?

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How could people who weren't in Haiti help?

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What could you do to help after an earthquake?

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Name Date

Milestone #5 Inquiry Question



Directions: Use what you learned during this milestone to answer the question.

Which features do you think are the best for making a house earthquake-proof? Why?

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