



Exploring Earthquakes

Teacher Pack



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Materials Needed for the Projects in this Unit

Earthquake Experiments

Materials Needed:

- 1 cardboard box for each pair of students
- 10 playing cards for each pair of students
- 10 dominoes for each pair of students
- A handful of building blocks for each pair of students
- A metal pie pan for each pair of students
- Enough rice or beans to fill the bottom of the pie pan for each pair of students

Earthquake-Proof House Models

Materials Needed:

- Playing cards, dominoes, and building blocks from the experiment
- Clay
- Cardboard
- Pipe Cleaners
- Pom-Poms
- Glue
- Tape



Books About Earthquakes

Note for the Teacher: Gather as many books as you can about earthquakes.

Suggested Books:

Disaster Zone: Earthquakes by Cari Meister

DK Eyewitness Books: Volcano and Earthquake by Susanna Van Rose

DK Readers L4: Earthquakes and Other Natural Disasters by Harriet Griffey

Earthquakes by Ker Than

Earthquakes! by Cy Armour

Earthquakes: Geology and Weather by William B. Rice

Everything Earthquakes and Tsunamis by Baby Professor

Jump Into Science: Earthquakes by Ellen J. Prager

Let's Read and Find Out: Earthquakes by Dr. Franklyn M. Branley

National Geographic Kids Everything Volcanoes and Earthquakes by Kathy Furgang

Powerful Earthquakes by Greg Roza

Sofie and Daniel Get Ready for Earthquakes by Lin K. Glenn and Darcy Brown

The Magic School Bus Presents: Volcanoes and Earthquakes by Tom Jackson

Why Do Tectonic Plates Crash and Slip? by Baby Professor



Earthquake Magnitude Matching

Answer Key



Teacher Notes: Have your students use the [Australian Geographic website](#) to match the earthquakes with their magnitudes. Use this page to check their work. If there are two letters, that means either one is correct because both magnitudes are the same.

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





Sample Earthquake Research



Teacher Notes: Use this sample research to model the project for your students. You can use the books you gathered and websites to show them how to find the information.

Location of the Earthquake <i>Near the city of Kathmandu in central Nepal</i>	Magnitude of the Earthquake <i>7.8</i>	Date and Time the Earthquake Occurred <i>April 25, 2015 11:56 Nepal time</i>	Number of People Killed and Injured <i>8,964 people killed 21,952 people injured</i>
Damage Done by the Earthquake <i>600,000 structures in Kathmandu and surrounding areas damaged or destroyed, including Taleju Temple and the 9-story Dharahara Tower</i>	Epicenter Information <i>About 21 miles east-southeast of Lamjung and 48 miles northwest of Kathmandu - near the Gorkha district</i>		Aftershock Information <i>2 large aftershocks within 1 day Several dozen smaller aftershocks in days following the earthquake</i>
Cause of the Earthquake <i>Thrust faulting, like compression-driven fracturing It relieved compressional pressure between tectonic plates.</i>			
Tectonic Plates Involved <i>The Eurasian Tectonic Plate and the Indian section of the Indo-Australian Plate</i>	Other Effects of the Earthquake (landslides, tsunamis, etc.) <i>Landslides that devastated rural villages An avalanche on Mount Everest that killed 19 climbers and stranded hundreds more</i>		
Cost of Damage and Disaster Relief <i>More than 5 billion dollars</i>	Groups That Helped with Disaster Relief <i>Nepalese army assisted in rescue and recovery work United Nations raised money India, China, and several other countries sent help The Red Cross treated injured people.</i>		
Other Important Facts <i>Hundreds of thousands of people were homeless. The shaking was felt by over 142 million people.</i>			

Name

Date

Earthquakes Quick Quiz



Directions: Read each question. Circle the best answer. Use the information from your research to complete the sentences.

1. What is the magnitude of an earthquake?

- A. How powerful it is on the Richter scale
- B. The center of the earthquake
- C. How many people were hurt
- D. How loud the earthquake was

The earthquake I researched happened in and its magnitude was

2. Which of these is NOT a possible side effect of an earthquake?

- A. A tsunami
- B. A hurricane
- C. A landslide
- D. An avalanche

The earthquake I researched caused a lot of damage, including

3. What causes earthquakes?

- A. The center of the Earth starts to shake, and the movement goes up to the Earth's surface.
- B. Thunderstorms and lots of rain cause the Earth's surface to shake.
- C. Lightning strikes dry trees, and when they fall over, an earthquake happens.
- D. Tectonic plates move against each other and cause the Earth's surface to shake.

The earthquake I researched was caused by

Earthquakes Quick Quiz

Answer Key



Directions: Read each question. Circle the best answer. Use the information from your research to complete the sentences.

1. What is the magnitude of an earthquake?

- A. *How powerful it is on the Richter scale*
- B. The center of the earthquake
- C. How many people were hurt
- D. How loud the earthquake was

The earthquake I researched happened in *Answers will vary.* and its magnitude was

2. Which of these is NOT a possible side effect of an earthquake?

- A. A tsunami
- B. *A hurricane*
- C. A landslide
- D. An avalanche

The earthquake I researched caused a lot of damage, including *Answers will vary.*

3. What causes earthquakes?

- A. The center of the Earth starts to shake, and the movement goes up to the Earth's surface.
- B. Thunderstorms and lots of rain cause the Earth's surface to shake.
- C. Lightning strikes dry trees, and when they fall over, an earthquake happens.
- D. *Tectonic plates move against each other and cause the Earth's surface to shake.*

The earthquake I researched was caused by *Answers will vary.*



Earthquake Safety Tips *Answer Key*



Teacher Notes: Show your students the video "[How to Protect Yourself During an Earthquake](#)". Have them fill the safety tips into the boxes below. Discuss the answers as a class.

DO

- *Take shelter under a sturdy piece of furniture or in the corner of a room if you're inside.*
- *Cover your head and neck.*
- *If you're outside, stay away from buildings and things that could collapse.*
- *If you're driving, stop your car a safe distance from things that could fall.*
- *Be careful of aftershocks.*
- *Listen to the radio for safety instructions.*
- *Turn off the water and gas.*
- *When the earthquake is over, head to a meeting point.*
- *Make sure your neighbors don't need help when the earthquake is over.*
- *Store dangerous items properly so they don't fall.*
- *Prepare an emergency disaster kit.*

DON'T

- *Run away - objects can fall on you.*
- *Go near windows or mirrors.*
- *Get out of your car.*
- *Use an elevator.*
- *Smoke or light candles.*
- *Touch fallen power lines.*
- *Make phone calls.*
- *Go near coastal areas because there could be a tsunami.*



Earthquake Relief Efforts

Answer Key



Teacher Notes: Show your students the video “[Haiti Desperate for Help After Deadly Earthquake](#)”. Have them answer the questions as they watch it. Discuss the answers as a class.

What damage did the Haiti earthquake do?

A medical oxygen plant was damaged. Two thousand people were killed. Thousands more lost their homes and had nothing. The roads were damaged from mudslides.

How were people in Haiti helping after the earthquake?

They were collaborating to clean up the damage and to build temporary shelters for people who lost their homes. They were trying to reach people in remote areas, like up in the mountains.

How could people who weren't in Haiti help?

They could donate basic necessities and money to organizations that were trying to help. They could also send donations of water and food.

What could you do to help after an earthquake?

Answers will vary.



Earthquakes

Summative Assessment



Part A

Directions: Read each statement. Write “T” if the statement is true about earthquakes and “F” if the statement is false. Fix the sentences that are false to make them true .

- If you’re driving during an earthquake, you should get out of the car and find shelter under a tree.

- Earthquakes happen when tectonic plates collide and cause the ground to shake.

- The measurement of the strength of an earthquake is called the epicenter.

- It’s easy to predict when an earthquake will happen.

- Earthquakes can also cause tsunamis and avalanches to happen.

- You should ride an elevator to get out of a tall building during an earthquake.

Part B

Directions: Use complete sentences to answer the questions.

If you lived in an area with frequent earthquakes, what would you do to be prepared and stay safe during the next one?

.....

.....

.....

What would you do after the earthquake to help with disaster relief?

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Earthquakes

Summative Assessment

Answer Key



Part A

Directions: Read each statement. Write “T” if the statement is true about earthquakes and “F” if the statement is false. Fix the sentences that are false to make them true .

- F If you’re driving during an earthquake, you should ~~get out of the car and find shelter under a tree.~~ *stay in the car and park away from objects that could fall.*
- T Earthquakes happen when tectonic plates collide and cause the ground to shake.
- F The measurement of the strength of an earthquake is called the ~~epicenter.~~ *magnitude*
- F It’s ~~easy~~ *hard* to predict when an earthquake will happen.
- T Earthquakes can also cause tsunamis and avalanches to happen.
- F You should ~~ride an elevator~~ *use the stairs* to get out of a tall building during an earthquake.

Part B

Directions: Use complete sentences to answer the questions.

If you lived in an area with frequent earthquakes, what would you do to be prepared and stay safe during the next one?

Answers will vary.

.....

.....

What would you do after the earthquake to help with disaster relief?

Answers will vary.

.....

.....

Name

Date

Exploring Earthquakes Project Rubric

	4	3	2	1
Earthquake Research	The student answered all 13 questions about the earthquake accurately.	The student answered between 10 and 12 questions accurately.	The student answered between 5 and 9 questions accurately.	The student answered less than 5 questions accurately.
Earthquake-Proof House Planning	The student used information from the experiments and video to answer all 3 questions and to sketch the house.	The student used information from the experiments and video to answer 2 questions and to sketch the house.	The student answered the questions and sketched the house but didn't use information from the experiments or the video.	The student didn't complete the questions or the sketch.
Earthquake-Proof House Model	The student used the provided materials to create the model and clearly showed the parts that would protect it during an earthquake.	The student used the provided materials to create the model and included some parts that would protect it during an earthquake.	The student used the provided materials to create the model, but there's no evidence of parts that would protect it during an earthquake.	The student didn't use the provided materials to create the model.
Presentation	The presentation was very clear and easy to understand. The student explained the earthquake research and details about the earthquake-proof house.	The presentation was clear and easy to understand. The student explained most of the earthquake research and details about the earthquake-proof house.	Parts of the presentation were hard to understand. The student didn't explain some of the earthquake research and details about the earthquake-proof house.	The presentation wasn't clear or easy to understand. The student didn't explain the earthquake research or details about the earthquake-proof house.

Teacher's comments:

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