

# Student Tools for Emergency Planning (STEP) Program

Supplemental Hazard Lesson: Earthquakes  
Instructor Guide



FEMA



# STEP SUPPLEMENTAL HAZARD LESSON: EARTHQUAKES



The STEP Earthquakes Supplemental Hazard Lesson will help students to:

- Understand how to protect themselves if an earthquake occurs
- Learn where earthquakes are likeliest to occur
- Prepare ahead of time with earthquake drills, a family communications plan, and extra food, water, and other supplies

**Time: (30 min)**

## Key Messages



- Earthquakes can happen at any time, anywhere without warning, but there are certain areas of the country more likely to experience them.
- Remember the phrase “Drop, Cover, and Hold On.”
- If you are inside during an earthquake, move away from things that can fall down, drop to the floor, get under a sturdy piece of furniture, and hold on.
- If you are outside when an earthquake occurs, move away from buildings, streetlights, and powerlines, and stay in your car if you are in one.
- You can prepare to stay safe during earthquakes by holding drills with your family.
- If you’re trapped under debris, don’t yell for help! Cover your mouth with your shirt and tap on a pipe or wall so that rescuers can find you.

## Skills



- Science
- English
- Math
- Preparedness
- Identification
- Real World Problem Solving

## Activities



- Watch Disaster Dodgers Video: Earthquakes (2:56 min.)
- Earthquakes discussion and Qs/As
- The Day the Earth Shook reading and history activity

## Materials



- AV and internet for video
- Copies of reading and history activity
- Pencils for each student

## EARTHQUAKES LESSON

Although earthquakes can occur almost anywhere in the United States, some areas are more susceptible than others. This lesson can be used anywhere, but is particularly important in parts of the country where earthquakes are more common. Information about earthquake risk is available at [www.fema.gov/emergency-managers/risk-management/earthquake/hazard-maps](http://www.fema.gov/emergency-managers/risk-management/earthquake/hazard-maps).



**Safety Tip:** Discussing disasters can trigger a strong emotional response in some students who have experienced an earthquake. Let the students know that it's normal to feel anxious or stressed out sometimes and that everyone reacts differently to stressful situations. Suggest they talk to parents or other trusted adults if they are feeling upset. See page 7 of the STEP Instructor Guide for advice on safeguarding students as well as the book list on page 42 for resources on emotional resilience.

**Teaching Tip:** Consider timing this lesson around International ShakeOut Day, held each year on the third Thursday in October. During what's called the Great ShakeOut, participants are encouraged to hold earthquake drills at their school, home, or business. For more information, see [www.shakeout.org](http://www.shakeout.org).

### Activity 1: Disaster Dodgers Earthquakes Video

**Action:** Go to the FEMA YouTube Disaster Dodgers video channel, and play the **Earthquakes** video. You can also access it at [www.youtube.com/watch?v=c7DJK\\_odXgU&list=PL720Kw\\_OoJlLXAc3P4kZMAbaQiyYCSXit&index=4](http://www.youtube.com/watch?v=c7DJK_odXgU&list=PL720Kw_OoJlLXAc3P4kZMAbaQiyYCSXit&index=4).



### Discussion Questions

**Instructor Script:** The Disaster Dodgers video will tell you about earthquakes and how to stay safe during them. An earthquake is the sudden, quick shaking of the earth. It is caused by rock breaking and moving under the ground. Additional earthquakes, known as aftershocks, can occur for hours, days, or even months after the first earthquake. These are usually smaller than the first earthquake.



Earthquakes can happen anywhere without warning, but they are more likely to occur in certain areas of the country, including California, Alaska, and other states in the West. Parts of Missouri and states around it experienced big earthquakes 200 years ago, and could have another large quake any time.

**Teaching Tip:** Consider reviewing the hazard map on page 20 of the main curriculum's Instructor Guide with your students. In the PDF version (available in the digital resources folder as Disaster Map Activity for Lesson 1), you can hover over the earthquake icon to highlight areas of the country in which earthquakes are most common. More information on earthquake safety is available at [ready.gov/kids/disaster-facts/earthquakes](https://ready.gov/kids/disaster-facts/earthquakes) and [ready.gov/earthquakes](https://ready.gov/earthquakes).

**Action:** Begin a general group discussion on earthquakes and actions to stay safe.

QUESTIONS	POTENTIAL ANSWERS
What is an earthquake?	An earthquake is the sudden, rapid shaking of the ground caused by the breaking and shifting of underground rock.
How is the strength of an earthquake measured?	The Richter scale is used to measure earthquake strength. It goes from 0.0 (no earthquake) to 10.0.
What should you do if you are <i>inside</i> and feel an earthquake?	<p>Drop, cover, and hold on.</p> <p>Don't run outside where something could fall on you.</p> <p>If you are unable to drop, cover, and hold on: get as low as possible and move away from windows or other items that can fall on you; do not try to transfer from your wheelchair, recliner, or bed during the shaking; if you use a wheelchair, lock your wheels and remain seated until the shaking stops; and always protect your head and neck with your arms, a pillow, a book, or whatever is available.</p>
What should you do if you are <i>outside</i> and feel an earthquake?	Move away from buildings, streetlights, and power lines.
What should happen if you're in a car and an earthquake hits?	The driver should stop the car and everyone should stay inside.
How can I protect myself after an earthquake?	<p>Do not enter a damaged building.</p> <p>Open cabinets carefully. Objects might have moved and could fall on you.</p> <p>Wear long pants, long sleeves, and shoes to protect your skin from getting scratched by broken objects.</p> <p>Text, don't talk so that you don't tie up phone lines needed by emergency workers. Texting may work even if cell service is down.</p>
How can your family prepare for an earthquake?	<p>Have a practice drill—drop, cover, and hold on!</p> <p>Make sure your disaster supply kit is up-to-date and within easy reach.</p> <p>Practice your family emergency communication plan.</p> <p>Make an emergency plan so you'll know what to do.</p> <p>Ask your parents to secure items that might fall down or off the wall.</p>

## Activity 2: The Day the Earth Shook



**Instructor Script:** *We've learned a lot about earthquakes and what to do to protect yourself. We're now going to read a story about earthquakes in Alaska. It's told by a boy who lives in Alaska's biggest city, Anchorage, and his Grandpa Nick, who experienced the largest earthquake ever recorded in the United States, back in 1964. As you read the story, think about what you would do if you felt the ground suddenly begin to shake. Then answer the questions after the story.*

**Action:** Hand out print copies of the activity or have students complete the PDF on their devices.

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*Read the story about earthquakes in Alaska and answer the questions.*

### The Day the Earth Shook

My Grandpa Nick and I were at the park when we felt the ground shudder a little, kind of like a big truck was rumbling by. “Drop, cover, and hold on,” I shouted as I ran toward a picnic table to scramble underneath. But that slight rumble was all that happened. This time.



I live in Anchorage, Alaska. We get a lot of earthquakes here, and we just get used to feeling a little shaking every once in a while, which is what happened when I was with my grandpa at the park. But there are also big, scarier earthquakes as well.

A few years ago just after I got to school the building started shaking. Everyone in the class dropped to the floor immediately. We crouched under our desks, with our arms protecting our heads. When it was over, we could see that lots of books and ceiling tiles had fallen to the floor and the smart board at the front of the classroom was dangling off the wall.

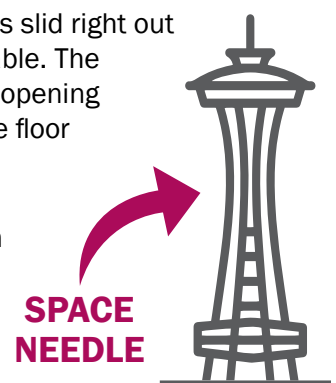
Grandpa Nick was a boy when the biggest quake ever in the United States struck. It’s now called the Great Alaska Earthquake. Here’s what he told me:

### Grandpa’s Story

“It was March 1964, and I was home from school on spring break, although as usual it was still snowy and not much like spring at all. Your great Aunt Jenny and I were watching TV, and my mom — your great-grandma — was starting to make dinner. The house began shaking like crazy and we all dove to the floor and hung on.

“I’m not going to lie. It was really frightening. Pictures on the walls started falling and books slid right out of their shelves onto the floor. Bowls my mom was cooking with clattered off the kitchen table. The quake lasted only four minutes, but it seemed like forever. We had to be careful afterward opening cupboards because glasses and plates had slid to the edge and would have crashed to the floor otherwise.

“Here in Anchorage, we were 75 miles away from the quake’s epicenter, which is where an earthquake begins. The shaking ripples out from that center, so we felt it quite a lot. But places much farther away felt it too. The 500-foot tall Space Needle in Seattle 1,200 miles away quivered. Water in lakes and rivers splashed around as the Earth shook as far away as Texas, more than 4,000 miles away.



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“But the ground shaking wasn’t the only thing that caused so much destruction. It also caused a tsunami, giant waves in the ocean that flooded beaches and parts of towns not just in Alaska, but in the states of Washington and Oregon, and Canada, too.

### What’s a tsunami?



A **tsunami** (pronounced soo-nahm-ee) is a series of waves caused by a large and sudden disturbance of the sea, often from an earthquake. Tsunami waves move outward in all directions from where the earthquake started and can move across entire oceans. The waves that come ashore can be 100 feet or higher.

“Our family was lucky that day. Our house wasn’t too damaged. We had to rebuild the front porch since it collapsed, though. However, landslides triggered by the earthquake destroyed a lot of buildings and cars in Anchorage. We had no electricity for days, and had to use our woodstove to stay warm.

“Thinking of that giant earthquake is a good reminder that we need to make sure we’re prepared if another big quake strikes. Earthquakes can damage power plants so we could lose electricity. They can also damage natural gas lines, and the gas has to be turned off to stay safe.

“That’s why today at your house and my house we have an emergency kit with three days of food and water, as well as a battery-powered radio, flashlights, and extra batteries. I even have extra cat food for my cats. Also, because an earthquake can happen anytime, we make sure we have extra wood for our fireplaces and woodstoves in case we lose power in the winter.”



## Staying Safe Today

After Grandpa Nick finished telling me about the earthquake when he was a boy, I started wondering what else we could do to prepare and stay safe. He told me that buildings are now constructed to be stronger so they can survive earthquakes better.

Although Grandpa Nick told me we can’t predict when an earthquake will strike, he said we do know that they can cause tsunamis, which can endanger people who live along the ocean’s coast. Officials will put out a warning to leave the area if there will be a tsunami near you. This is the time to move to higher ground away from the water. Even though it might sound really interesting to view such a giant wave, once you’re close enough to see it, it’s too late to escape it since it moves so fast, Grandpa Nick said.

In all this time since Grandpa Nick was a boy, there hasn’t been an earthquake that powerful again. But I know Alaska has more earthquakes than any other region in the United States, about 1,000 every month. I’m glad most of them are small like the one we had today, and I’m also glad that while they can be scary, we know what to do if another big one strikes.

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### The Day the Earth Shook

1. What are some words used in the story to describe the motion of the ground during an earthquake?

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2. If the earthquake took place in 1964, how many years ago was it? \_\_\_\_\_

3. What are three things that the earthquake caused to happen?

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4. What can you do to prepare for an earthquake before it happens?

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5. What three actions should you take if you feel the ground start to shake?

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6. What's the most important thing to do if you hear a tsunami warning? Do you think you could have a tsunami near where you live?

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# STEP SUPPLEMENTAL HAZARD LESSON

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### The Day the Earth Shook Answer Key

1. What are some words used in the story to describe the motion of the ground during an earthquake?

**Shudder, Rumble, Shake, Quiver**

2. If the earthquake took place in 1964, how many years ago was it? **[Subtract 1964 from the current year]**

3. What are three things that the earthquake caused to happen?

**(1) Pictures, books, and dishes fell to the floor**

**(2) Space Needle quivered, and lakes as far away as Texas rippled**

**(3) Tsunamis that flooded areas in Alaska, Oregon, Washington state, and Alaska**

4. What can you do to prepare for an earthquake before it happens?

**Have a practice earthquake drill; Practice your family communications plan; Create or update your emergency supply kit**

5. What three actions should you take if you feel the ground start to shake?

**(1) Drop**

**(2) Cover**

**(3) Hold on**

6. What's the most important thing to do if you hear a tsunami warning? Do you think you could have a tsunami near where you live?

**Move away from the ocean to higher ground, like the top of a hill. Those who live close to the ocean on the East and West coasts could be affected by tsunamis.**