



## Earth Shake



Image courtesy NASA

Have you ever felt an earthquake? Most earthquakes occur in areas around the Pacific Ocean. This area is called the "Ring of Fire." About 90 percent of the world's earthquakes happen there.

Some people think we are experiencing more earthquakes than we used to. Records kept since 1900 show that the average number of major quakes in a year is 16. Some years there are more, and other years there are fewer.

### What is an earthquake?

An earthquake is the sudden release of energy caused by two sections of the Earth's crust slipping past each other. On the surface, the place where the two sections meet is called a **fault**. Below the surface, where the earthquake starts, is called the **hypocenter**. Directly above that, on the surface, is the **epicenter**.

During an earthquake:

- the Earth shakes and cracks;
- there are landslides;
- sandy areas with a lot of water might turn to liquid for a matter of seconds up to a few minutes. The liquid can be forced upward as high as 20 feet.

A **tsunami** (tsoo-NAHM-mee) happens when an earthquake takes place under the ocean floor. These water waves can be 100 feet high and travel at about 600 miles per hour! The name comes from a Japanese word meaning "harbor wave."

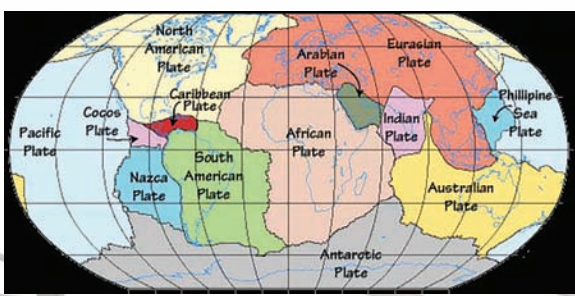


Image courtesy Fish and Wildlife Service

### It's a puzzle

The surface, or **crust**, that surrounds the Earth is broken into 15 huge parts called **tectonic plates**. These plates are like puzzle pieces, and they are constantly sliding past each other and bumping into each other.

The jagged edges of these plates are where faults are located. Most earthquakes occur along these faults. When the plates move enough to overcome the friction at the edges, energy is released and an earthquake happens.

The energy moves in waves, like ripples on a pond. We feel that energy as the earth shaking.

During a quake, one plate might move to the side. The other plate might move the other way. Or one plate might move up and the other might move down.

### Our next quake?

According to the U.S. Geological Survey, scientists have no way of predicting earthquakes. However, they do record earthquakes all around the world over long periods of time, which can help them discover which areas are mostly likely to have quakes.

### Do people cause quakes?

Scientists study how many earthquakes occur and where they occur. According to Justin Rubinstein, a research geophysicist for the U.S. Geological Survey, human activity *can* produce earthquakes. Scientists call these quakes **induced**.

You may hear that **hydraulic fracturing**, or fracking, causes earthquakes. In fracking, oil and gas producers direct water underground to try to break up rocks so they can reach more oil or gas. But Rubinstein says fracking itself is not responsible for damaging earthquakes.

Instead, he believes **wastewater disposal** is causing a big jump in earthquakes in Oklahoma, Texas, Kansas and other Midwestern states. This process gets rid of extra water from fracking and energy production by injecting it deep into the ground. If the well is near a fault, water can pry the plates apart and cause them to move.

### Rating a quake

The Richter magnitude scale measures how much energy is released during a quake.

- 1.0 to 2.0 — usually detected only by instruments
- 3.0 to 4.0 — can hardly be felt
- 4.0 to 5.0 — generally felt, slight damage
- 6.0 — moderately destructive
- 7.0 — major earthquake
- 8.0 — great earthquake

### Resources



#### On the Web:

- [earthquake.usgs.gov/learn/kids/](http://earthquake.usgs.gov/learn/kids/)

#### At the library:

- "Earthquakes" by Franklyn M. Branley and Megan Lloyd

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## Try 'n' Find

Words that remind us of earthquakes are hidden in this puzzle. Some words are hidden backward or diagonally, and some letters are used twice. See if you can find:



CRUST, DISPOSAL,  
EARTHQUAKE,  
ENERGY, EPICENTER,  
FAULT, FRACTURING,  
FRICTION, HYDRAULIC,  
HYPOCENTER,  
LANDSLIDE, MAGNITUDE,  
MOVE, PLATE, SCALE,  
TECTONIC, WASTEWATER,  
WAVE.

C R U S T E P I C E N T E R Y  
H B D I E A R T H Q U A K E G  
Y I H Y P O C E N T E R I W R  
D F R A C T U R I N G S C P E  
R S O R E T A W E T S A W T N  
A C M A G N I T U D E T A L E  
U A E V O M L A N D S L I D E  
L L C I N O T C E T P U Y P V  
I E N O I T C I R F P A A Q A  
C J I L A S O P S I D F S A W

## Cook's Corner

### Chicken and Chili Cream Cheese Wraps

#### You'll need:

- 8 ounces light cream cheese, softened
- 1 (4-ounce) can diced green chilies
- 1 teaspoon chili powder
- 4 fajita-size flour tortillas (regular or whole wheat)
- 2 cups shredded cooked chicken breast



\* You'll need an adult's help with this recipe.

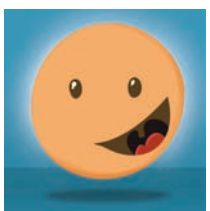
#### What to do:

1. In a medium bowl, combine cream cheese, chilies and chili powder. Mix well.
2. Spread mixture onto tortillas to within 1/4 inch of edges.
3. Top cream cheese mixture with chicken. Roll up tightly. Serves 4.

Adapted from "The Robin Takes 5 Cookbook for Busy Families" with permission from Andrews McMeel Publishing (andrewsmcmeel.com).

## 7 Little Words for Kids

Use the letters in the boxes to make a word with the same meaning as the clue. The numbers in parentheses represent the number of letters in the solution. Each letter combination can be used only once, but all letter combinations will be necessary to complete the puzzle.



1. in a chair (7) \_\_\_\_\_
2. smelly animal (5) \_\_\_\_\_
3. vacation on a boat (6) \_\_\_\_\_
4. dress-up outfit (7) \_\_\_\_\_
5. what you put on french fries (7) \_\_\_\_\_
6. go south for the winter (7) \_\_\_\_\_
7. sister of your mom or dad (4) \_\_\_\_\_

RA	COST	SIT	KE
AU	SKU	TCH	MIG
TE	CRUI	NT	NK
SE	UP	TING	UME

Answers: sitting, skunk, cruise, costume, ketchup, migrate, aunt.

## Mini Jokes



**Eva:** What do cows produce during an earthquake?  
**Eddie:** Milkshakes!

## Eco Note



Most of the energy we use now comes from oil and coal, which will run out someday. But there are other sources of energy we could be using that are renewable. Sun and wind are used to heat water and buildings, make electricity and run cars. Other renewable energy sources are **hydropower**, from water; **geothermal**, power from heat deep in the Earth; and **biomass**, made from plants. Learn all you can about renewable energy sources.

adapted with permission from "The New 50 Simple Things Kids Can Do to Save the Earth" by The Earthworks Group, Andrews McMeel Publishing (andrewsmcmeel.com)

## For later:

Look in your newspaper for articles about earthquakes around the world.

## Teachers:

For standards-based activities to accompany this feature, visit: [bbs.amuniversal.com/Everyone\\_content/Teaching\\_Guides/The\\_Mini\\_Page/](http://bbs.amuniversal.com/Everyone_content/Teaching_Guides/The_Mini_Page/)

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