

Earthquakes

By Donna Carlson



Image Source : TWITTER/MANISHA_JAIPUR

EARTHQUAKES are one of the biggest and most frightening natural PHENOMENA (a remarkable event) to happen on the earth. Although they seem to be relatively rare, an interesting fact that not many people realize is that earthquakes are a daily OCCURRENCE on the earth. Every few minutes an earthquake happens somewhere in the world. The majority of them are too small to feel and don't even rattle a spoon in a teacup. However, there is at least one strong earthquake every week somewhere on the earth. For people who live at or near where an earthquake occurs, they need to be very careful. SIGNIFICANT earthquakes can be DISASTROUS to the communities in which they occur and to the land where they take place.

Spell: OCCURRENCE SIGNIFICANT DISASTROUS
What is one of the biggest and most frightening events to happen on earth?

EARTHQUAKES

Another word for a remarkable event? PHENOMENA

How often do earthquakes occur? EVERY DAY, EVERY FEW MINUTES

Significant earthquakes can be disastrous to what? COMMUNITIES, LAND, BUILDINGS

Why are earthquakes disastrous to the communities in which they occur?

An earthquake happens when rocks that are inside the land or under the sea come apart. There are different levels underneath the earth's surface that are called PLATES, and these plates contain big rocks that can move and rub up against each other or run into each other. The earth has seven major plates, and they are: African, ANTARCTIC, EURASIAN, INDO-AUSTRALIAN, North American, Pacific, and South American. These plates move very slowly in different directions. Most earthquakes happen along the edges of these plates where they move against each other. The plates can slide, slip, and bump into each other along their edges. When the plates move a lot against each other, the FRICTION this causes can be big enough to cause an earthquake to occur. The rocks will split apart when they are stretched or squeezed too much. When the rocks break, a lot of energy gets released. That energy causes an earthquake because the energy from the breaking rocks makes the ground move.

Spell: ANTARCTIC EURASIAN INDO-AUSTRALIAN

What are the different levels underneath the earth's surface called?

PLATES

What is it called when the plates move against each other? FRICTION

A lot of what gets released when the rocks in the plates rub against each other? ENERGY

How many major plates does the earth have? 7

In addition to the North and South American plates what is the name of another of the 7 major plates? AFRICAN, ANTARCTIC, EURASIAN, INDO-AUSTRALIAN, PACIFIC

What causes an earthquake to happen? ENERGY, PLATES MOVING, FRICTION

VAKTivity: Video about what causes earthquakes (2.4 minutes):

<https://www.youtube.com/watch?v=QogJIQV83pY>

When a person experiences an earthquake, they might feel like the ground beneath them is shaking or rolling. Sometimes it can be much shorter and feels like a quick JOLT (a sudden movement) under one's feet. Earthquakes can be short or long. Some are only a few seconds and others last for many minutes. The ground might move up, down, or sideways. The sideways motion is especially dangerous because it can cause tall buildings to sway back and forth and weaker houses and buildings to collapse. For this reason, in areas that are especially earthquake-prone, buildings and houses are built with SPECIFICATIONS that help to keep them strongly FORTIFIED in case an earthquake occurs so that their chances of collapsing or being damaged are decreased. They are built with especially strong FOUNDATIONS so that they will stay safe when the ground moves underneath them.

Spell: SPECIFICATIONS FORTIFIED JOLT
What motion is most dangerous for the ground to move in an earthquake?
SIDEWAYS

What are buildings and houses built within earthquake-prone areas?
SPECIFICATIONS

Buildings and houses are built with especially strong _____ in order to stay safe. FOUNDATIONS

What can the ground feel like to a person experiencing an earthquake?
SHAKING, ROLLING, MOVING, JOLT

How long can earthquakes last? SHORT, LONG, A FEW SECONDS,
MANY MINUTES, VARIABLE

What instrument automatically detects and records the intensity, direction, and duration of a movement of the ground, especially earthquakes?
SEISMOGRAPH, SEISMOMETER

Sometimes before a big earthquake occurs, there are many small earthquakes that happen. These are called FORESHOCKS because they happen before the bigger earthquake. They are like a warning that something bigger might be coming. The big earthquake is called the MAINSHOCK. After it occurs, there may again be many small quakes, and these are called AFTERSHOCKS since they occur after the main earthquake. Aftershocks can cause further damage to buildings and land that has already been weakened or affected by the main earthquake.

Spell: FORESHOCKS DAMAGE WEAKENED

What are small earthquakes called that happen before a big earthquake?

FORESHOCKS

What is the big earthquake called? MAINSHOCK

The small earthquakes that happen after a big earthquake are called _____?

AFTERSHOCKS

Foreshocks can _____ people that a bigger earthquake might happen soon. WARN

How many types of “shock” earthquakes are there? 3

What can aftershocks do? CAUSE MORE DAMAGE, SHAKE THE GROUND MORE

What type of earthquake would you find most interesting to safely experience?

One of the places on the earth where earthquakes are especially common is the state of CALIFORNIA in the United States. This is where the SAN ANDREAS FAULT is located. The San Andreas Fault is a major FRACTURE (crack) in the earth’s crust. Two of Earth’s big plates, the Pacific Plate and the North American Plate, meet at the San Andreas Fault. These plates move in different directions. Over time, the rocky edges of the two plates bump into each other and stick together. The process of stretching and pulling is slow, and every once in a while, the rock edges break, which releases energy and causes earthquakes.

Spell: ROCKY FRACTURE

What is the name of the fault in California? SAN ANDREAS FAULT

What is one of the most common places on the earth for earthquakes to occur? CALIFORNIA

How many plates meet at the San Andreas Fault? 2

Name one of the two plates that meet at the San Andreas Fault. PACIFIC, NORTH AMERICAN PLATE

What is the capital of California? SACRAMENTO

The San Andreas fault goes through many major cities. What is one of the four largest? SAN JOSE, SAN FRANCISCO, RIVERSIDE, SAN BERNARDINO



Source: <https://www.britannica.com/event/San-Francisco-earthquake-of-1906>

One of the biggest known earthquakes to ever occur happened in California. It was the SAN FRANCISCO earthquake, and it took place on April 18, 1906, at 5:12 in the morning. This was one of the worst and deadliest earthquakes in the history of the United States. Over 3,000 people died and over 80% of the city was destroyed. To this day, the death toll is the greatest loss of life from a natural disaster in the history of California, and it still ranks high on the list of American disasters. Many people were left homeless. It had an estimated MAGNITUDE (size) of 7.9. After the earthquake, fires broke out in the RAVAGED city and lasted for several days, and caused even more damage than the earthquake did. A strong foreshock happened about 20 to 25 seconds before the mainshock. The mainshock lasted about 42 seconds and this is when the majority of the damage occurred. It was then followed by many aftershocks. It took years to rebuild the city and it was rebuilt with stronger buildings that would hopefully be able to WITHSTAND (remain undamaged by) future earthquakes and fires.

SPELL: WITHSTAND MAGNITUDE RAVAGED
What was the name of one of the biggest known earthquakes to ever

happen in California? SAN FRANCISCO EARTHQUAKE

What caused even more damage to the city than the earthquake? FIRES

On what date did the earthquake occur? APRIL 18, 1906

How many people died in the earthquake? OVER 3,000

What percentage of San Francisco was not destroyed? (equation) $100 - 80 = 20\%$ NOT DESTROYED

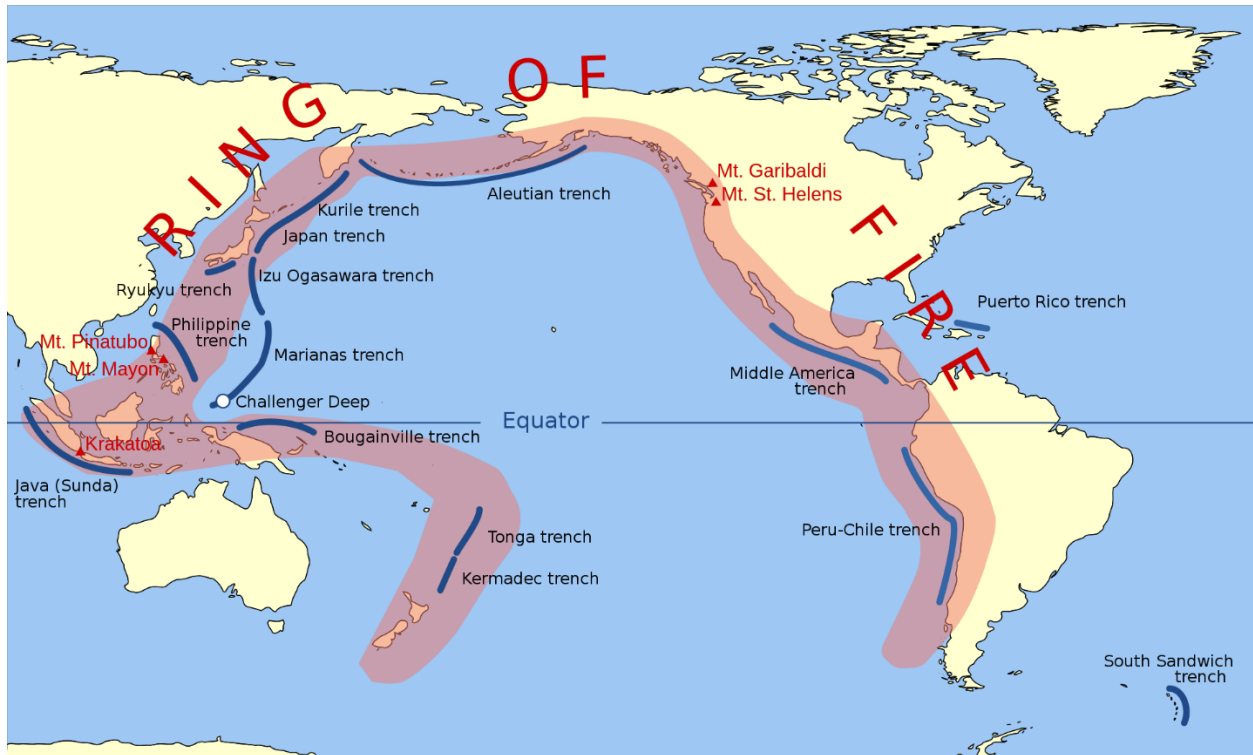
About how long did the earthquake last? 42 SECONDS

What was the estimated magnitude of this earthquake? 7.9

Many people were left _____ by the San Francisco Earthquake. DEAD, HOMELESS

Why do you think the fires caused more damage than the earthquake did?

The other place on the earth where earthquakes occur frequently is Ring of Fire; 90% of earthquakes occur in the Ring of Fire. It is a path along the floor of the Pacific Ocean that has many active VOLCANOES and frequent earthquakes. California is included in the Ring of Fire's boundaries, which goes from the bottom of South America up the coastline to North America's coastline, across the BERING STRAIT, down the coast of Asia, and ends at NEW ZEALAND. It is approximately 24,900 miles long and is located between several active plates. At the border between the Pacific and North American Plates (near the coast of California), there is a TRANSFORM BOUNDARY where the plates move sideways past one another, generating a high number of earthquakes as tension in the Earth's crust builds up and is then released.



Source: https://en.wikipedia.org/wiki/Ring_of_Fire

Spell: **BERING STRAIT** **NEW ZEALAND** **COASTLINE**

Where do 90% of earthquakes occur? **RING OF FIRE**

In which ocean is the Ring of Fire located? **PACIFIC**

What is found at the border of the Pacific and North American

Plates? **TRANSFORM BOUNDARY**

What percentage of earthquakes occur in the Ring of Fire? **90%**

Approximately how long is the Ring of Fire? **24,900 miles**

Name two areas of the world that border the Ring of Fire? **SOUTH AMERICA, NORTH AMERICA, BERING STRAIT, ASIA, NEW ZEALAND**

Tell me something about the Ring of Fire. **IN PACIFIC OCEAN, 90% OF EARTHQUAKES OCCUR THERE, 24,900 MILES LONG, MANY ACTIVE VOLCANOES, HAS SEVERAL ACTIVE PLATES, etc.**

What do you think it would be like to be in an earthquake?

What item or items would you want to take with you if you were fleeing a natural disaster?

Creative writing: Write about an adventure people could have in the Ring of Fire.

Creative writing: Write a short story about someone being in an earthquake and what it would be like.

Donna is a mother of two sons. She's from New England and loves living there again after living in other parts of the country. Two of her favorite things are reading and traveling.

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