Earthquakes - When the Earth Shakes and Moves

An earthquake happens when the ground suddenly shakes and moves. This shaking occurs because huge pieces of Earth's outer layer, called tectonic plates, are slowly moving and sometimes get stuck against each other.

Think of Earth's outer layer like a cracked eggshell made up of many large pieces. These pieces, or plates, are always moving very slowly - about as fast as your fingernails grow. Most of the time we can't feel this movement.

Sometimes these moving plates get stuck against each other, like when you try to slide two pieces of sandpaper together. Pressure builds up until suddenly the plates slip and move quickly. This sudden movement causes an earthquake.

The place underground where an earthquake starts is called the focus or hypocenter. The place on the surface directly above the focus is called the epicenter. The epicenter is usually where the shaking is strongest.

Scientists measure how strong earthquakes are using something called the Richter scale. Small earthquakes that you can barely feel might be a 2 or 3. Very strong earthquakes that can damage buildings might be a 7, 8, or 9.

Most earthquakes happen along the edges of tectonic plates. That's why places like California, Japan, and Chile have more earthquakes than other places. These areas sit right on the boundaries between different plates.

The San Andreas Fault in California is one of the most famous earthquake zones in the world. A fault is like a crack in the Earth where two plates meet. You can actually see parts of the San Andreas Fault from an airplane!

Earthquakes create different types of waves that travel through the Earth. P-waves (primary waves) are fast and arrive first. S-waves (secondary waves) are slower but stronger. Surface waves travel along the ground and cause most of the damage we see.

Animals sometimes act strangely before earthquakes. Dogs might bark more, horses might get nervous, and some animals might try to hide. Scientists aren't sure exactly why this happens, but animals might feel the tiny movements that come before bigger shakes.

Most earthquakes last less than a minute, and many last only a few seconds. But even a short earthquake can seem very long when you're experiencing it! The shaking might feel like being on a boat in rough water.

After a big earthquake, there are usually smaller earthquakes called aftershocks. These happen as the Earth settles into its new position. Aftershocks can continue for days, weeks, or even months after the main earthquake.

Scientists called seismologists study earthquakes using special instruments called seismographs. These machines can detect earthquakes from thousands of miles away and help scientists learn when and where earthquakes might happen.

Not all earthquakes are dangerous. Millions of small earthquakes happen every year that are so tiny people don't even feel them. Only the biggest earthquakes cause damage to buildings and can be dangerous to people.

If you feel an earthquake, the safest thing to do is 'Drop, Cover, and Hold On.' Drop to your hands and knees, take cover under a strong table or desk, and hold on to it. Stay away from windows and things that might fall.

Earthquakes can cause other natural events like landslides and tsunamis. A tsunami is a giant wave that can form when an earthquake happens under the ocean. The earthquake pushes the water up, creating huge waves that travel across the ocean.

Even though earthquakes can be scary, they're a natural part of how our planet works. The same forces that cause earthquakes also help create mountains, valleys, and other beautiful features of our Earth. Understanding earthquakes helps us build safer buildings and communities, and reminds us that we live on an amazing, dynamic planet that's always changing!