

INSPIRING **SCIENCE MAGAZINE** FOR GIRLS. FUN READING FOR ALL.

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Seaweeds:

Can This Ocean Plant Be the Key to Our Future?



Fei-Fei Li

*Dreams,
Determination,
and AI*

Earthquakes Shake It Off!

On April 18, 1906, the city of San Francisco began to tremble, and the air filled with the "roar of 10,000 lions." An earthquake shook the city so hard it toppled buildings, crippled the cable car, and kindled a blaze that lasted four days. San Francisco's earthquake is famous, but did you know that roughly 55 earthquakes shimmy the planet every day? Actually, most earthquakes are gentle and don't cause any damage. It's just the Earth's way of handling stress by - as Taylor Swift would say - *Shaking it Off*.

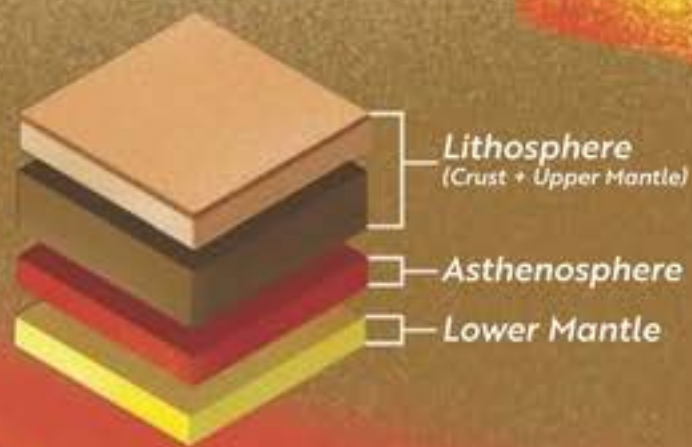
Moving plates
unleash powerful
forces that cause
earthquakes.

Why does the Earth shake?

The Earth's surface is broken into plates that fit together to cover our planet like a giant jigsaw puzzle. There are big plates and small ones, and they're always moving, drifting on a molten rock layer under the Earth's surface called the **asthenosphere**.

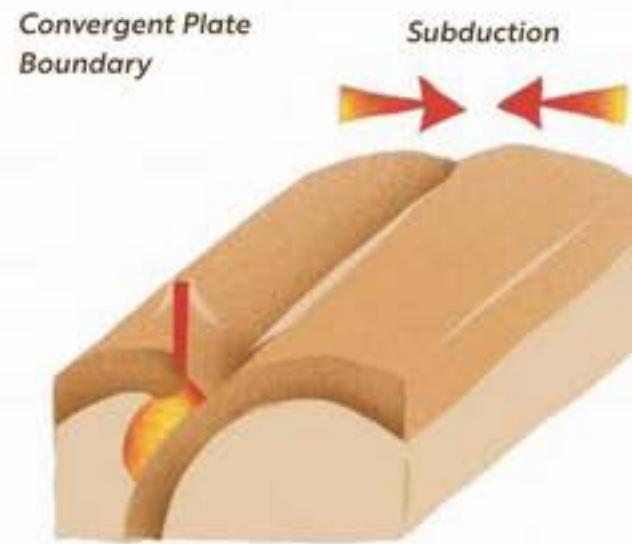


The Earth's crust is divided like a jigsaw puzzle into always-moving plates.



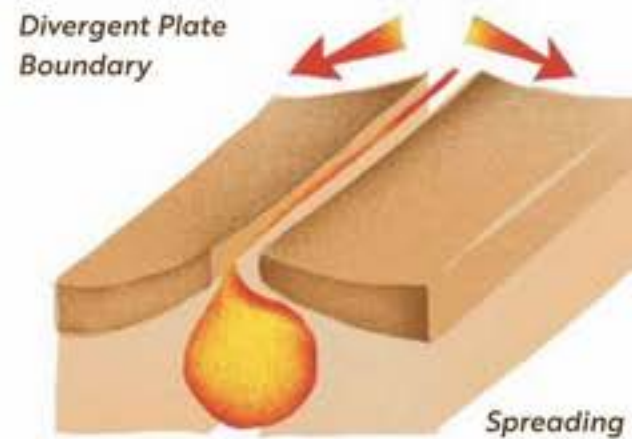
Convergent Plate Boundaries

In some areas, plates crash together. The collision may buckle one or both sides slowly over millennia, pushing plates upward into mountain ranges like the Himalayas. Or one plate may be shoved down under another plate, melting as it dives into the heat of the asthenosphere, often causing volcanoes to erupt on the upper plate.



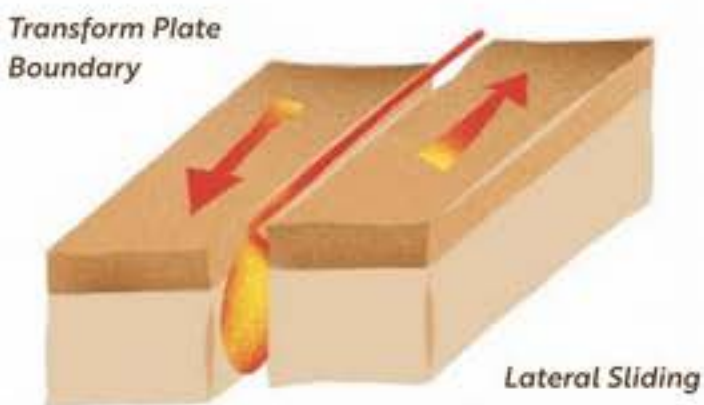
Divergent Plate Boundaries

In other areas, plates pull apart, opening cracks that spew out molten rock which hardens into new formations. Under the Atlantic Ocean, for example, divergent plates form a 10,000-mile-long underwater mountain range called the Mid-Atlantic Ridge.



Transform Plate Boundaries

Finally, some plates slide past each other, like the Pacific and North American plates. This plate boundary goes right through San Francisco.



How are faults related to earthquakes?

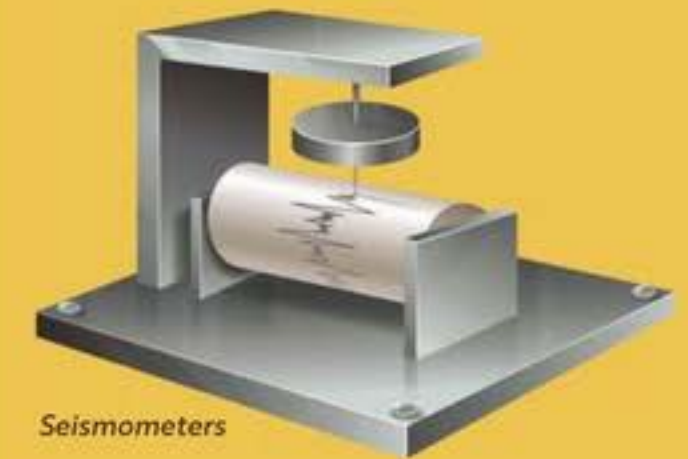
Since the Earth's surface is solid, it breaks when it moves, causing fracture zones called **Faults**. The Earth is covered in Faults. The 750-mile-long San Andreas Fault follows the California coast, and is where the Pacific plate slides along the North American plate. When the San Andreas Fault slid sideways in 1906, not only did it cause the earthquake that toppled San Francisco, it offset roads and fences by up to 32 feet. Imagine standing face-to-face with your best buddy on opposite sides of the fault and watching them slide 32 feet to your right!



After the earthquake in San Francisco, 1906.

Fun Fact

The Pacific Ocean perimeter is nicknamed the "Ring of Fire" for all the volcanic activity around the convergent Pacific plate.



Seismometers

How are earthquakes studied?

Seismology is the study of plate tectonics and the resulting earthquakes. Seismologists use sensors all over the planet to detect and pinpoint earthquakes, and measure their forces. From these, scientists have discovered that earthquakes occur frequently, generally along plate boundaries.



We talk about earthquake magnitude using the Richter Scale, a logarithmic scale that increases by factors of ten. So, an earthquake with a magnitude of 2 is ten times stronger than 1, a magnitude 3 is 100 times stronger, and so forth. Fans at a Taylor Swift concert last year in Seattle boogied so hard to 'Shake it Off' that sensors recorded a 2.3 magnitude earthquake – a Swift Quake! At 7.9, the San Francisco earthquake was equivalent to three hydrogen bombs of force.



Did you know?

The largest earthquake in recent history, a staggering magnitude 9.3, hit the Indian Ocean in 2004, starting a massive tsunami ocean wave 100 feet tall that crashed onto coasts in 14 different countries!

Can we predict earthquakes?

Large earthquakes can be deadly when they shake places where people live. Seismologists are working hard to predict earthquakes to save lives, but so far even the world's most advanced earthquake warning system in Mexico City can only predict a quake 90 seconds before impact. Smartphone alerts can help make the most of that minute, allowing people to get to safety: Don't run outside. Do get under a table or a desk and hold on!



A fence offset by the 1906 earthquake along the San Andreas fault.

Earthquakes shimmy the planet every day, letting off stress. By understanding plate tectonics, earthquakes, and faults, we humans can do better at protecting ourselves when the planet Shakes it Off.

