

What Causes Earthquakes and Volcanoes?

Chapter 7 Lesson 2
Part 2

ByDesign Science, Level 4
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Review

1. What are the layers of the earth, starting from the top and going inwards?
 - ♦ Crust, mantle, outer core, inner core
2. Is the inner core a liquid or solid?
 - ♦ Solid
3. Is the outer core a liquid or a solid?
 - ♦ Liquid
4. What is the thickest layer of the Earth?
 - ♦ Mantle
5. What is the thinnest layer of the Earth?
 - ♦ crust

Review

6. What is the main reason Earth has layers?
 - ♦ Density
7. What are plate tectonic?
 - ♦ Earth's crust broken into several large slabs of rock
8. About how many major plate tectonics are identified today?
 - ♦ 8
9. When are many earthquakes and volcano eruptions most like to occur?
 - ♦ when plates move

Moving Plates

- ♦ You have learned that Earth's crust is divided into tectonic plates.
- ♦ These plates are not stationary – they are moving very slowly today.



- ♦ Many creationist scientists believe that in the past, Earth's plates moved apart much more rapidly than they are observed to be moving today.

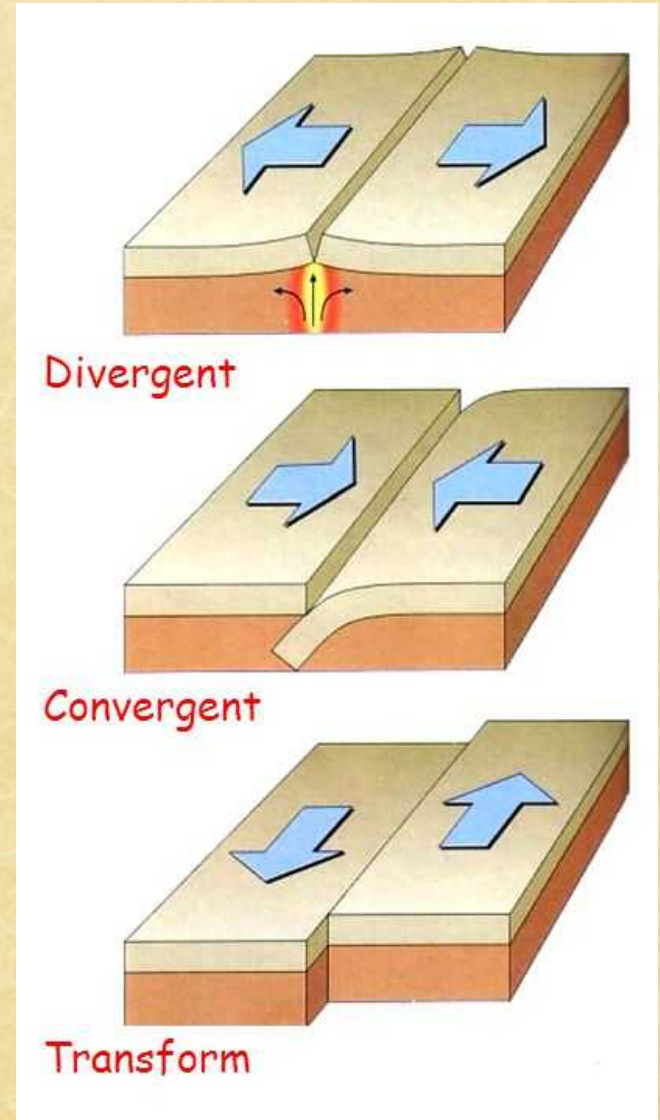
Moving Plates

- ♦ The study of the movement of Earth's tectonic plates is called plate tectonics.
- ♦ When a tectonic plate moves, everything that is on it also moves.
- ♦ In this lesson, you will learn how the movement of tectonic plates causes earthquakes and volcanoes.



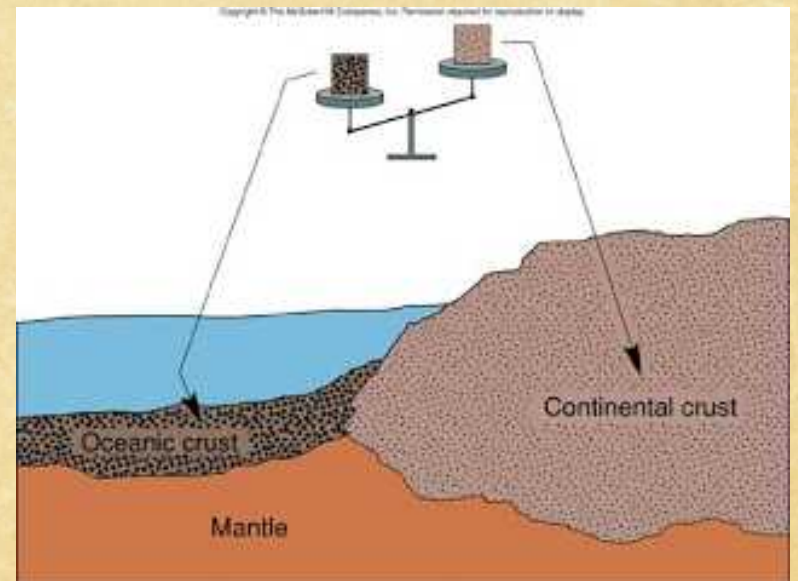
Moving Plates

- ♦ Tectonic plates move in three ways –
 - ♦ they collide with each other,
 - ♦ they move away from each other,
 - ♦ they slide past each other.
- ♦ Whether mountains or volcanoes form depends on the type of crust.

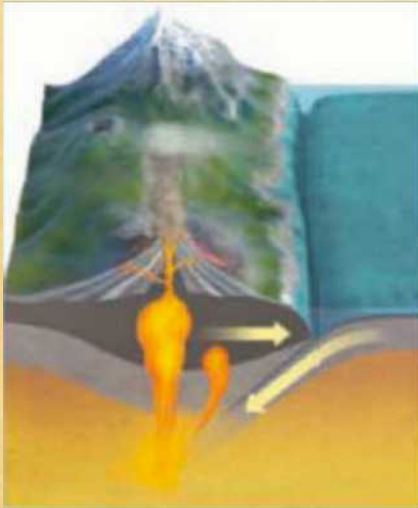


Moving Plates

- ♦ Earth's crust is made up of two types of crusts.
- ♦ Oceanic crust, which lies under the sea floor, and continental crust, which lies under the land.
- ♦ Oceanic crust is thinner and more dense than continental crust.



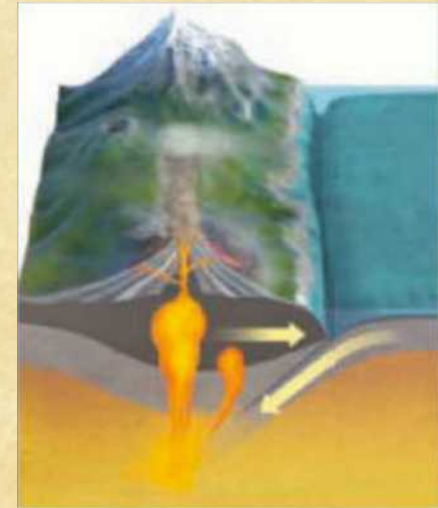
Moving Plates



- ♦ When tectonic plates collide, volcanoes or mountains can form.
- ♦ When the collision is between continental crust and oceanic crust, the dense oceanic crust is pushed below the continental crust and into the mantle.
- ♦ The hot mantle melts the rock that makes up the oceanic crust and forms magma.

Moving Plates

- ♦ Magma rises toward Earth's surface because it is less dense than the rock around it.
- ♦ It erupts onto Earth's surface, where it cools and forms rock.
- ♦ This rock builds up and forms a volcano.
- ♦ The Cascade Range in the northwestern United States was formed this way.



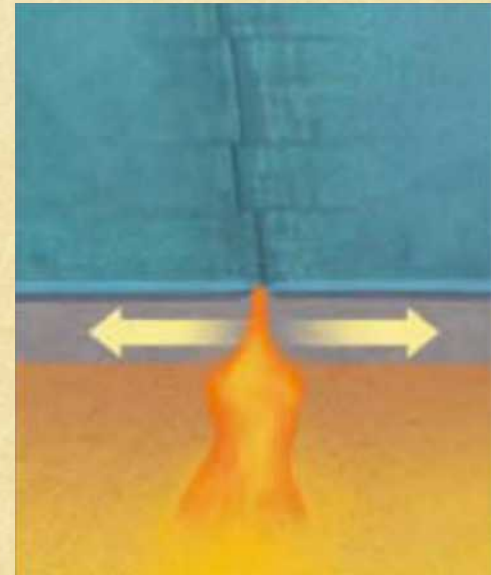
Moving Plates



- ♦ When continental crust collides with continental crust, neither one is pushed below the other.
- ♦ The colliding tectonic plates push the crust upward and form mountains.
- ♦ The Himalayan Mountains formed this way. In fact, they are still growing!

Moving Plates

- ♦ When tectonic plates move away from each other, they create a huge crack in Earth's crust.
- ♦ Magma rises to the surface and forms a mid-ocean ridge, a line of mountains on the sea floor.
- ♦ As the molten rock cools, it forms a new crust.
- ♦ This usually happens on the sea floor, where oceanic crust pulls away from oceanic crust.



Moving Plates



- ♦ Some volcanoes form away from plate boundaries.
- ♦ In places where the crust is thin, magma can push up through the crust and form a *hotspot volcano*.
- ♦ As the plate moves, it moves the volcano with it, and a new volcano forms over the hot spot.
- ♦ A chain of islands, such as the Hawaiian Islands, can be formed by hotspots.

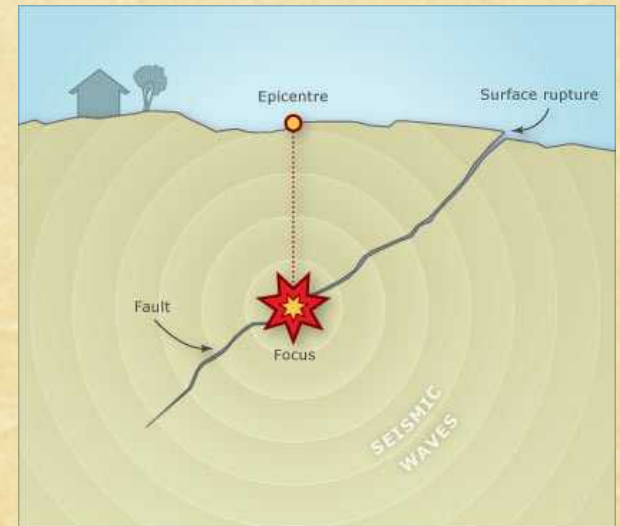
Earthquakes



- ♦ In just a few seconds, an earthquake can damage buildings and cause cracks to form in the ground.
- ♦ An *earthquake* is a vibration of Earth's crust that causes the land to shake.
- ♦ There are more than 1 million earthquakes in the world every year.
- ♦ Most are not strong enough to feel. Many of them occur in remote places on Earth's surface.

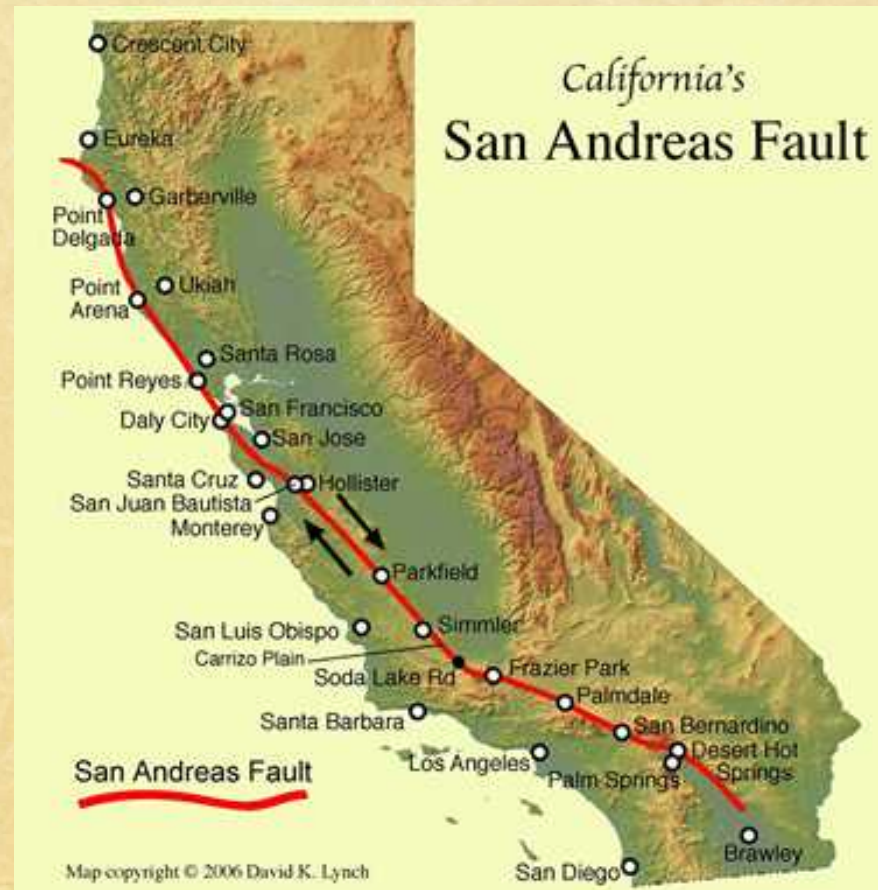
Earthquakes

- ♦ Earthquakes usually occur in locations where two plates are moving past each other.
- ♦ The moving plates put pressure on the rocks in the crust and causes it to break.
- ♦ The crack or break in the crust where the land moves is called a **fault**.
- ♦ Some faults are small, while others are large.



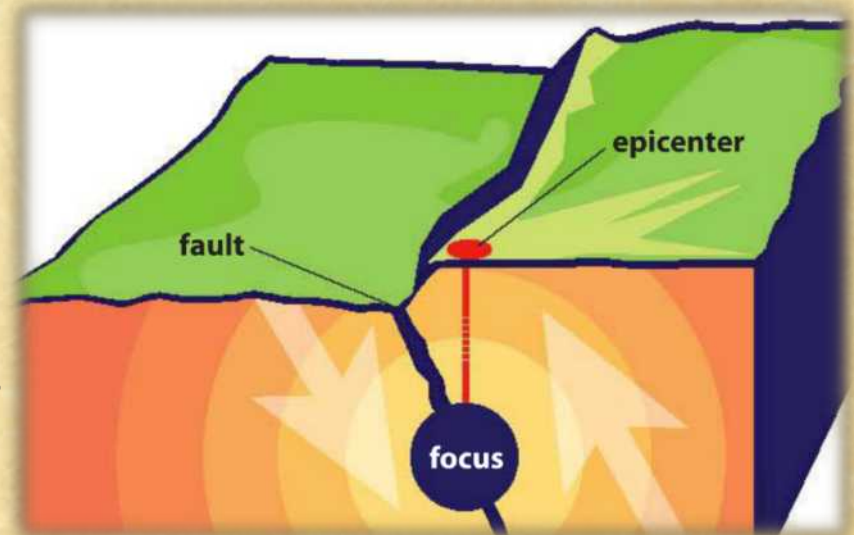
Earthquakes

- ♦ The famous San Andreas fault system in California is about 810 miles long.



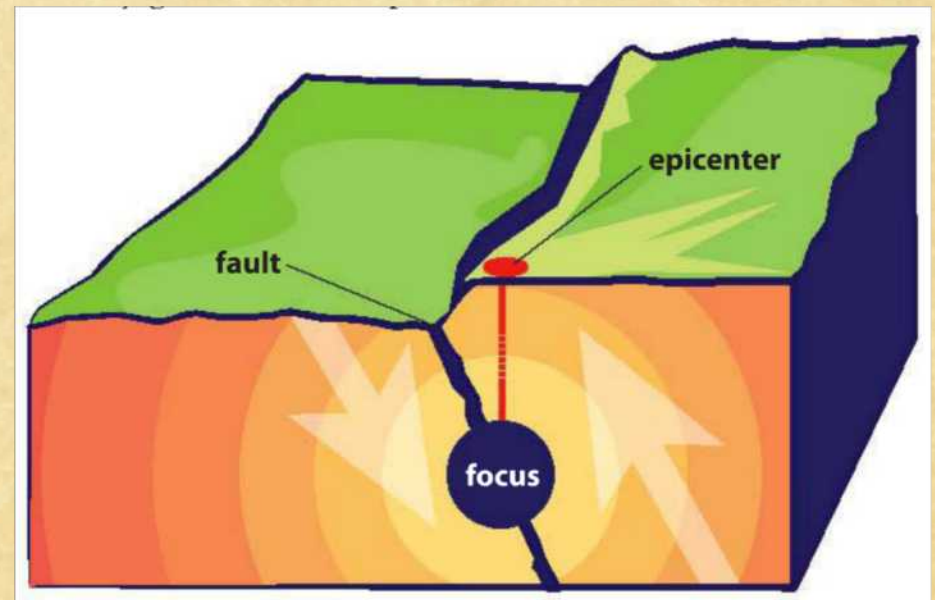
Earthquakes

- ♦ The location underground where an earthquake begins is the focus.
- ♦ The focus is usually less than 50 miles underground.
- ♦ At the focus, rock break or move and release energy.
- ♦ This energy travels as waves of vibration through the Earth's crust.
- ♦ This energy reaches Earth's surface.



Earthquakes

- ♦ Some of this energy causes the ground to move like ripples on a pond.
- ♦ The epicenter is the location on Earth's surface directly above the focus.
- ♦ The effects of the earthquake are usually greatest at the epicenter.



Earthquakes



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 - ♦ Mantle
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Review from Today's Lesson

10. What are the different type of plate tectonic movements?

- ♦ they collide with each other,
- ♦ They move away from each other,
- ♦ They slide past each other.

11. What are the different types of crust?

- ♦ oceanic and continental crust

Review from Today's Lesson

12. What happens when continental crust collides with oceanic crust?
 - ♦ Oceanic crust is pushed under the continental crust and a volcano is formed
13. What happens when continental crust collides with continental crust?
 - ♦ they both are pushed upward into a mountain
14. What happens when oceanic crust is pulled away from oceanic crust?
 - ♦ magma rises to the surface and forms new crust

Review from Today's Lesson

15. How are volcano hot spots formed?

- ♦ When magma pushes through thin crust

16. What is an earthquake?

- ♦ a vibration of Earth's crust that causes the land to shake

17. What is a fault?

- ♦ crack or break in the crust where the land moves

18. What is the focus?

- ♦ location underground where an earthquake begins

19. What is the epicenter?

- ♦ where the effects of the earthquake are usually the greatest