

Chapter 10 Lesson 3 Part 4

I can explain how plate movements cause earthquakes, mountains, and volcanoes.

SPI 0707.7.6 Describe the relationship between plate movements and earthquakes, mountain building, volcanoes, and sea floor spreading.

Moving Mantle Material

- Wegener was never able to explain why plates move.
- Today, researchers have created several possible explanations.
- All of these explanations use convection in one way or another.
- Therefore: The transfer of heat inside Earth provides the energy to move plates and causes many of Earth's surface features.

Mantle Convection Worksheet Brain Buddy

- In just a moment, I will tell you to move.
- When I do, you will get with your brain buddy to complete a few questions.
- You will need a blue and red art utensil. I will bring these around.
- You will have 15 minutes to complete the activity. You will complete one worksheet per buddy group.
- Move to your brain buddy's desk.
- We will go over the answers together in 15 minutes.

Features Caused by Plate Tectonics

- As plates move, they interact.
- This interaction can create features and forces on Earth's surface.
 - Mountains
 - Ocean Basins
 - Volcanoes
 - Earthquakes
- We will look at the specific causes of each of these tomorrow.

Exit Ticket

- <http://science.howstuffworks.com/environmental/plate-tectonics-videos-playlist.htm> BE CAREFUL WITH THE AD THAT SHOWS UP BEFORE THE VIDEO!
- Watch this short clip.
- Think about a time in your life when you saw a feature that was likely caused by plate tectonics.
- Write a paragraph explaining where you were, what it looked like, and how you know it was related to plate tectonics.

What Mastery Looks Like

24 Which geological feature was most likely formed when two lithospheric plates collided?

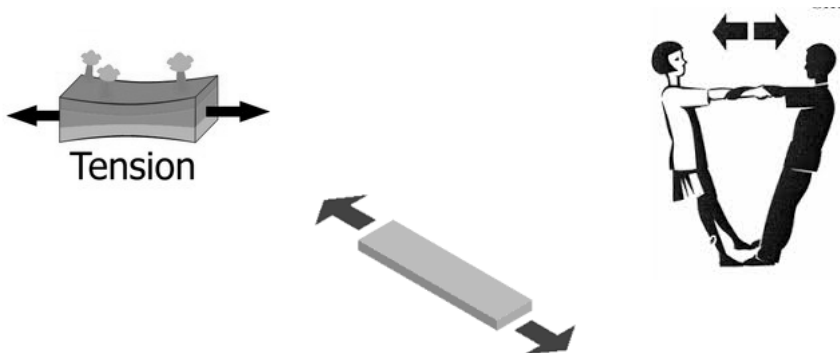
- F** Lake Michigan
- G** Grand Canyon
- H** Mississippi River delta
- J** Sierra Madre mountain range

Features Caused by Plate Tectonics

- Where do you see the effects of plate movement?
 - Discuss with your partner.

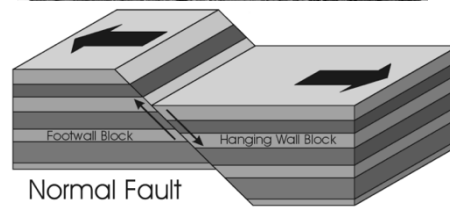
Normal Faults and Rift Valleys

- Tension Forces can stretch Earth's crust.



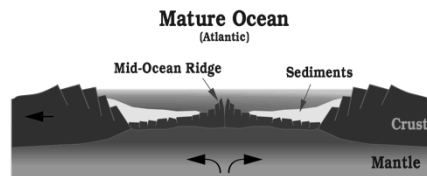
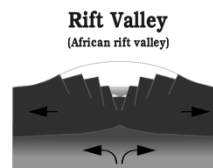
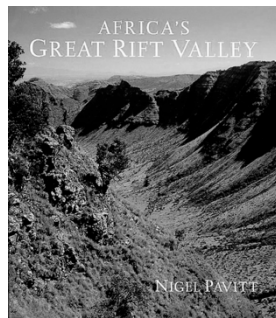
Normal Faults

- This stretching causes large blocks of crust to break and tilt or slide down the broken surfaces of crust.
- When rocks break and move along surfaces, a fault forms.
- Faults interrupt rock layers by moving them out of place.



Rift Valleys

- Rift valleys and mid-ocean ridges can form where Earth's crust separates.



Mid-Ocean Ridges

- East Pacific Rise is another mid-ocean ridge.



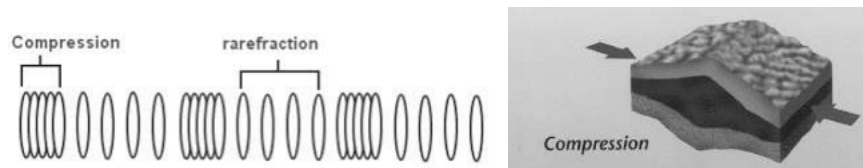
White Board Question

- Which of the following can occur when two plates diverge?
 - A. Mountains
 - B. Volcanic Island Arch
 - C. Rift Valley
 - D. Normal Fault

The answers are C and D.

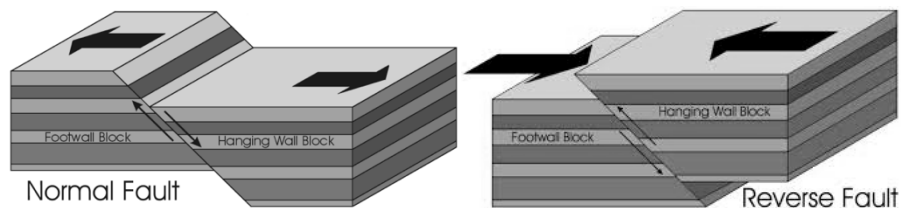
Mountains and Volcanoes

- Compression forces squeeze things together.
- Remember when we talked about compressional waves???
- The compression that happens with plates can be understood by thinking about compressions in a wave!



Compression Forces

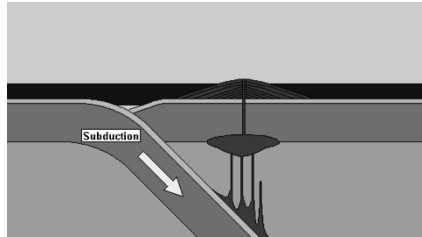
- When two CONTINENTAL plates collide, the forces cause massive folding and faulting of rock layers into mountain ranges. This is generally REVERSE faulting.



Do you remember us talking about a normal fault a few minutes ago? What is the difference between a normal fault and a reverse fault? Discuss with a shoulder partner.

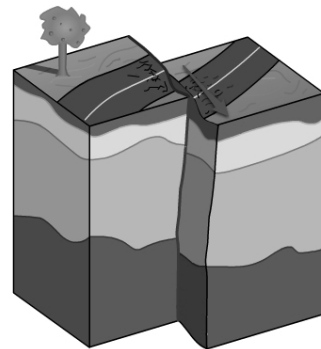
Compression Forces

- When two OCEANIC plates converge, the denser plate is forced beneath the other plate.
- Curved chains of volcanic islands called island arcs form above the sinking plate.



Strike-Slip Faults

- At transform boundaries, two plates slide past one another without converging or diverging.
- The plates stick and then slide, mostly in a horizontal direction, along large strike-slip faults.
- In a strike-slip fault, rocks on opposite sides of the fault move in opposite directions, or in the same direction at different rates.



Current Data

- Hawaii is moving toward Japan at a rate of about 8.3 centimeters per year.
- Maryland is moving away from England at a rate of 1.7 centimeters per year.
- Scientists know this thanks to Satellite Laser Ranging System data.
- They observe that plates move at rates ranging from about 1 cm to 12 cm per year.

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Exit Ticket

- On p. 317, pick 2 questions to answer.
- Then, create two additional questions to ask a friend. It can be on ANYTHING in the chapter.
- Be ready to share.
- Make your questions HIGHER LEVEL!
- Here are some suggestions for how to start your question.
 - Predict what would happen if...
 - Describe an invention that would help a scientist...
 - Compare ____ to ____
 - Explain how...