

1. What was the name of the very large land mass that Alfred Wegener thought existed 300 million years ago? **Pangea**
2. What kinds of evidence did Alfred Wegener use to support his Theory of Continental Drift that said this land mass existed? Name at least three.
Location of different fossils, location of different types of rocks, location of old mountain ranges, location of long ago glaciers
3. What couldn't Alfred Wegener explain that was necessary for other scientists to accept his Theory of Continental Drift?
How the continents moved
4. Today we know that Alfred Wegener was correct with his theory of Continental Drift. Since the 1960's geologists have obtained new evidence to support his theory. What do we **now** call his Theory of Continental Drift?
Plate Tectonics
5. How does the Hawaiian Island chain help us understand that plates move?
The Hawaiian islands are on the Pacific Plate which is moving over a hot spot. The islands were created, one at a time, by the hot spot.

6. Since the 1960's we have more information that can answer the problem that Alfred Wegener couldn't solve. What is sonar and how is it used by geologists?
Sonar is sound waves that bounce off the ocean floor.
These sound waves show features on the ocean floor.
7. What was found out by geologists when they used sonar to study the ocean floor?
The mid-ocean ridge and trenches
8. How do the ages of sea floor rocks help us prove plate tectonics happens?
The plates moving apart along the mid-ocean ridge have different ages of rocks. The newest rocks are along the mid-ocean ridge where lava comes out. The oldest rocks are next to the continents.
9. What did scientists learn when they plotted tens of thousands of earthquake epicenters on a map?
The Earth's crust (lithosphere) is in pieces called plates.
10. How do we know what the inside of Earth is like all the way to the inner core?
From the P and S waves bouncing off of the different layers and from S waves not traveling through the liquid outer core.

11. What are the five layers of Earth and how are they each different from each other?
- Lithosphere - cold, brittle, rigid rock
 - Asthenosphere - warm, ductile, weak rock
 - Mantle - hot, ductile, dense rock
 - Outer core - hot, liquid iron and nickel
 - Inner core - hot, solid iron and nickel
12. What is a convection current and how does it happen inside Earth? Make sure you mention where inside Earth convection currents are happening and where the heat comes from that causes the convection currents.
- Convection is heat being carried by a moving substance.
 - The hot core heats the mantle above it.
 - The hot mantle rock rises slowly upwards towards the lithosphere where the hot rock moves sideways cooling as it moves.
 - The cooler rock sinks back down to the core and is heated up again.
13. How do convection currents help explain Wegener's Theory of Continental Drift?
- Convection currents in the mantle help explain how the plates move.

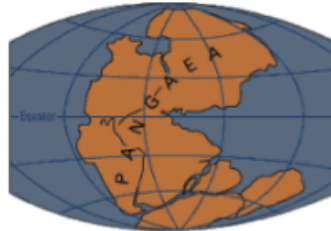
Basics of Plate Tectonics

Know the following: (Pages in the book are in parenthesis.)

1. Alfred Wegener and his Theory of Continental Drift (pp. 144-148, 162)
Make sure you know what the theory states and what information Wegener used to support his theory.
2. The edges of the plates – how we know where they are from plotting earthquake epicenters.
3. Structure of the inside of the Earth (pp. 132-139)
You should know how we know about the inside of the Earth and what all the layers are as well as how they are described.
4. Convection currents and how they work in the mantle (pp. 140-143, 158-159)
5. Evidence to support Plate Tectonics -
Sonar, how it works, and sea floor topography - mid-ocean ridge and trenches (p. 150)
Hawaiian Islands and how we know that the Pacific Plate is moving (pp. 219)
Age of the ocean floor – how the rocks are gotten and what we have learned from them (pp.151-153)



Pangea



Permian Period
225 million years ago



Triassic Period
200 million years ago



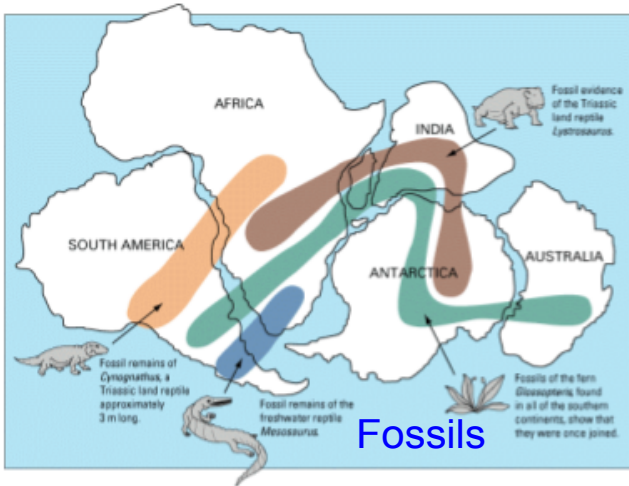
Jurassic Period
135 million years ago



Cretaceous Period
65 million years ago



Present Day
Continental Drift



Wegener's evidence for Pangea



A.



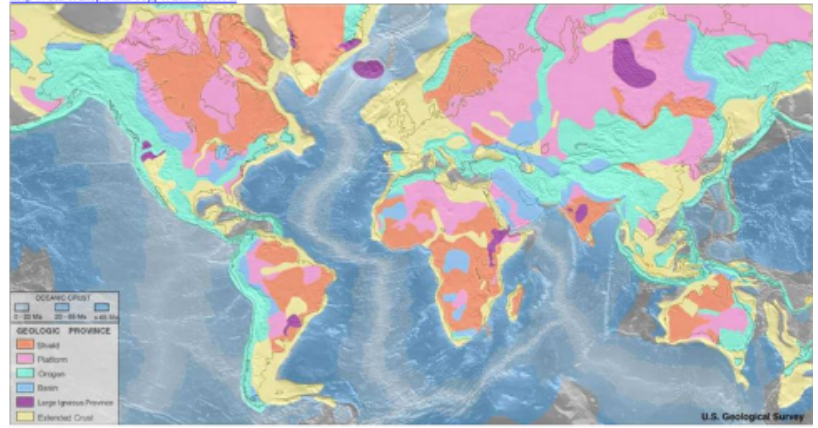
B.

Glaciers

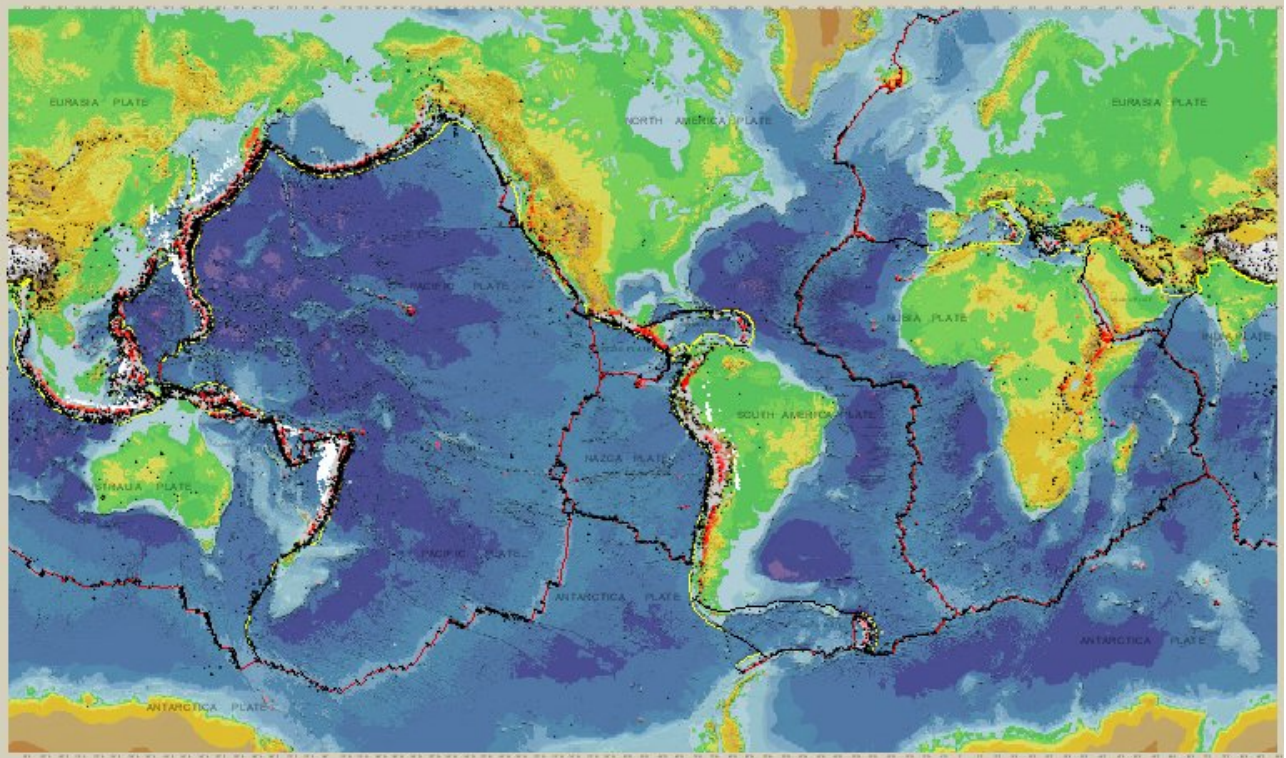


Mountain Ranges

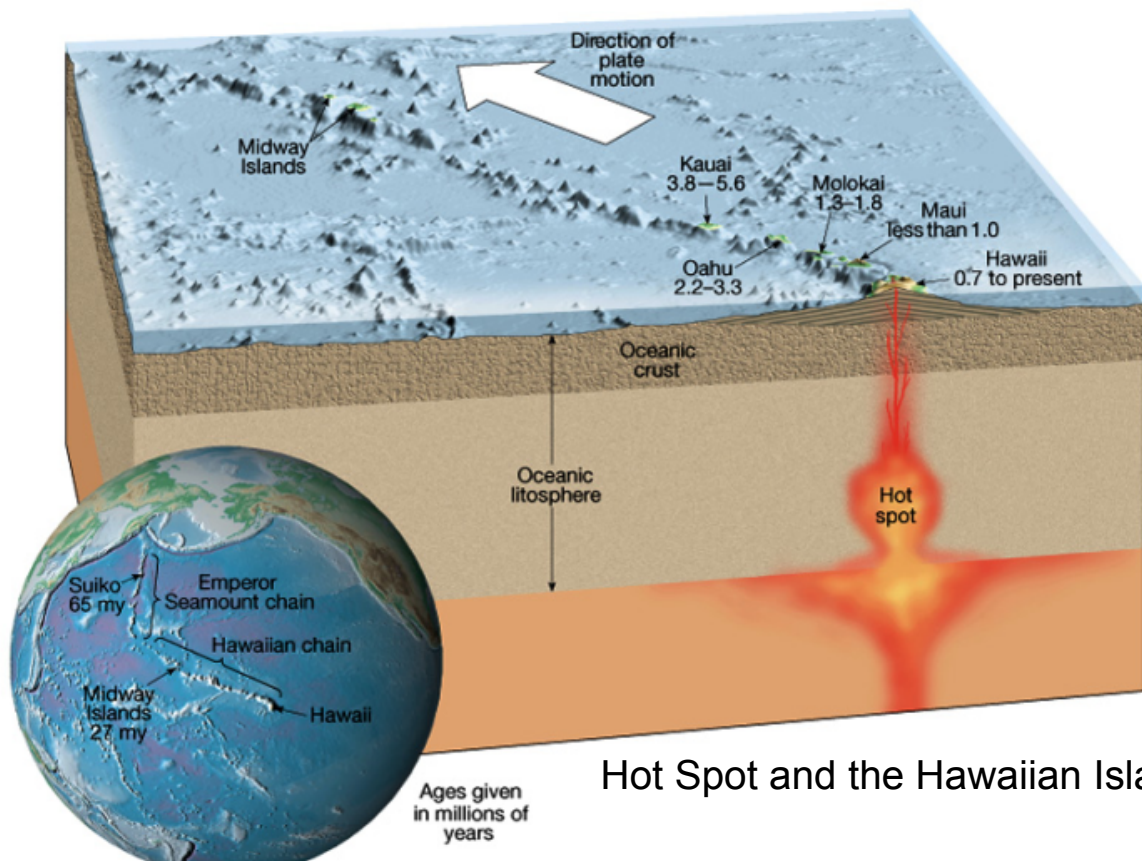
<http://en.wikipedia.org/wiki/Craton>



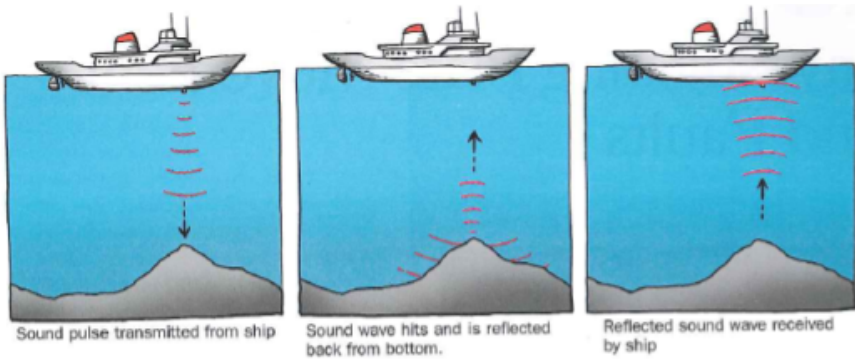
Rock Types



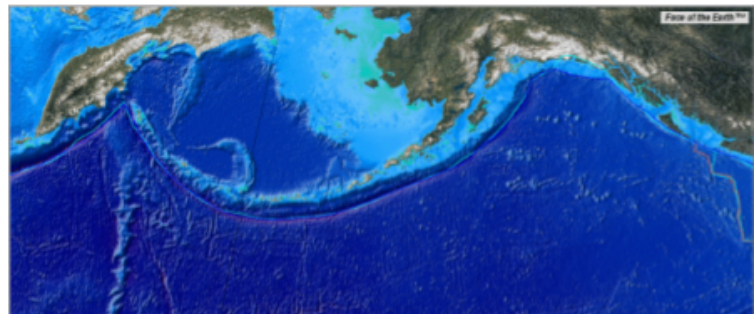
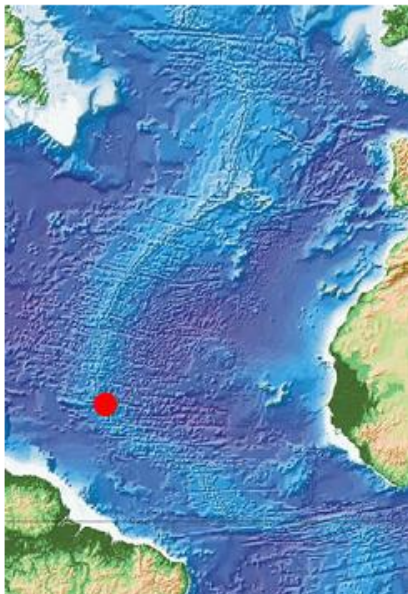
Earthquakes and Volcanoes and the Plates

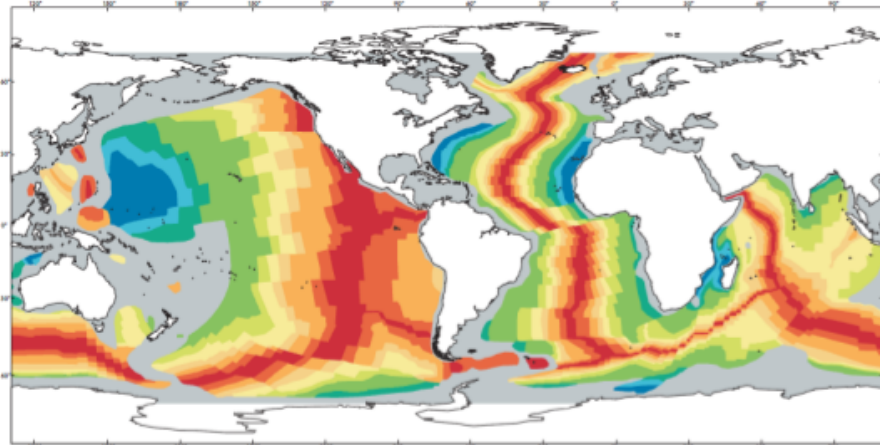
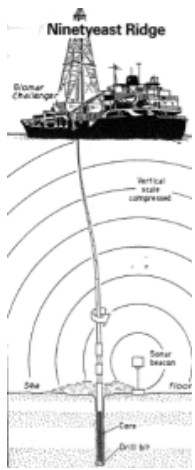
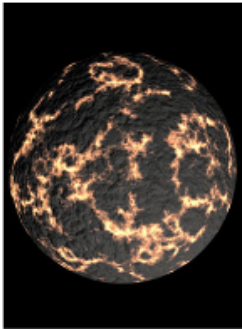


Hot Spot and the Hawaiian Islands

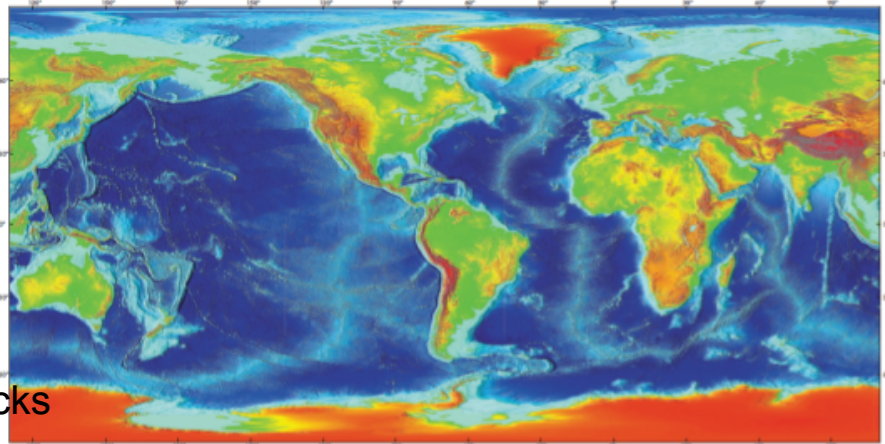


Sonar and the ocean floor - trenches and the mid-ocean ridge

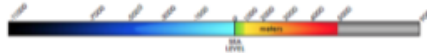




Age of Seafloor Rocks

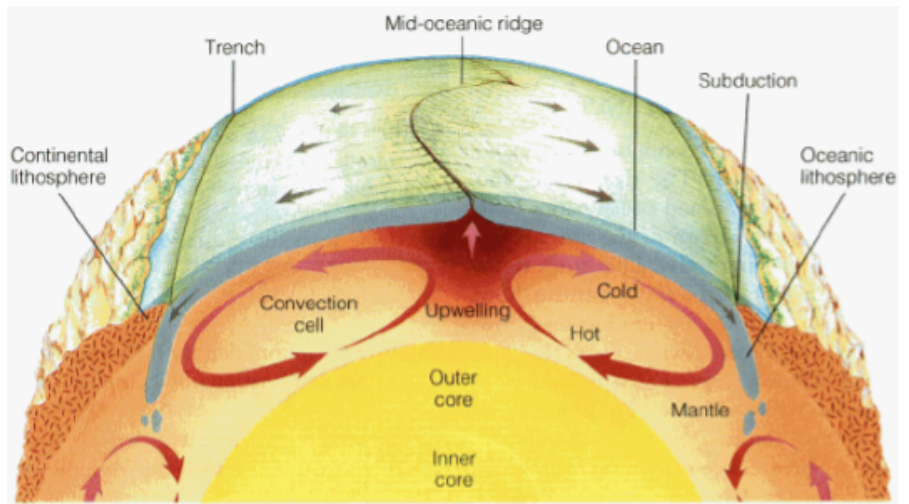
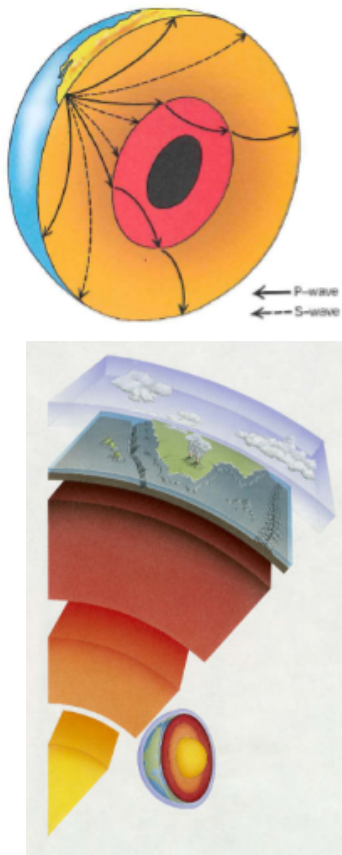


Global Topography
 compilation and layout by Ronit S. Egozi, 2012



© 2012 Ronit S. Egozi. All rights reserved. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. For more information, see <http://creativecommons.org/licenses/by-nc-sa/4.0/>.

Age of Seafloor Rocks



Inside the Earth and Convection Currents

1. What is Pangea?
2. How do we know what the inside of the Earth is like?
3. How do we know that sea floor is growing larger in some places?
4. How do convection currents help move the plates?
5. How do the Hawaiian Islands support the idea that plates move?
6. What does the theory of Continental Drift state?

7. What was the theory of Continental drift lacking? What could it not explain?
8. What early evidence supported the theory of Continental Drift? Name three items.
9. How are rocks gotten from the ocean floor?
10. What are the two inner most layers of Earth and how are they different?
11. How is the lithosphere different from the asthenosphere?
12. What is sonar and how does it work?

13. How do the locations of earthquakes help us understand plate tectonics?
14. What features on the ocean floor are important to understanding plate tectonics?
These features were discovered with sonar.
15. What causes convection currents in the mantle?
16. How do we know where the plate boundaries are located?
17. What is the difference in thickness between oceanic and continental crust?
18. Who developed the theory of Continental Drift?
19. What makes the center of the Earth hot?