

Geological Events Summarizer

Name _____ Date _____



222 million years ago



65 million years ago



PRESENT DAY

1. Use the diagram above to answer the three questions below.

a. Identify the concept shown: _____

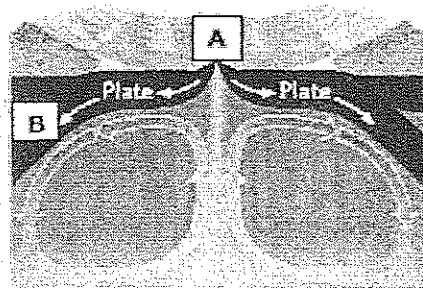
b. Describe the concept: _____

c. Identify evidence used to support the concept: _____

2. Identify and describe process A and B shown in the diagram to the right.

Process A: _____

Process B: _____



3. Identify below the three types of plate boundaries, the direction in which they move, and the types of geological events they can cause.

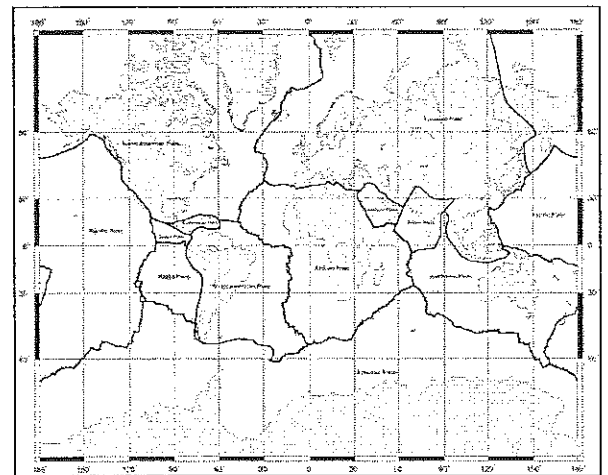
1. Describe what is meant by continental drift. _____

2. Describe the evidence that supports continental drift. _____

3. Describe the process of seafloor spreading _____

4. The Theory of Plate Tectonics states _____

5. The map to the right illustrates



6. _____ form along _____

7. When plates move they can

8. The result of _____ can be seen at _____

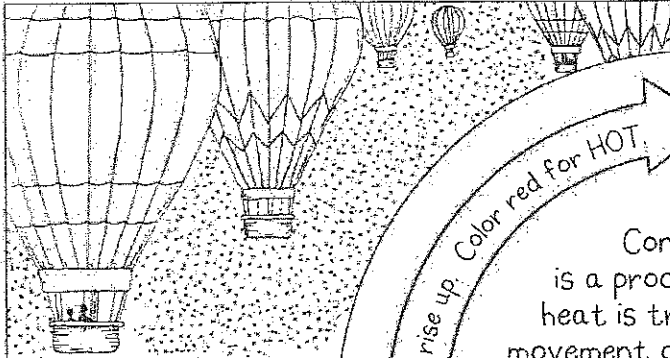
The questions below should be completed after the Boundary Chart on the next page

9. Volcano Facts: _____

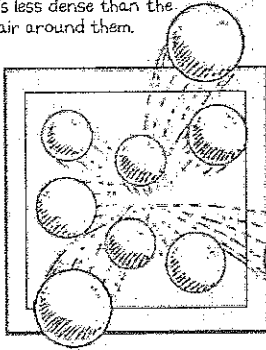
10. Earthquake Facts: _____

11. Tsunami Facts: _____

CONVECTION

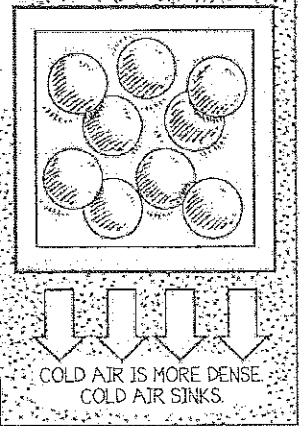


Hot gases and liquids are less dense, so they float upward when surrounded by gases and liquids of medium temperature. That's how hot air balloons float: the hot air in them is less dense than the air around them.



Heated molecules move around so much that they sometimes jump right out of their container. Therefore, the hot fluid becomes less dense, or "lighter."

Chilled molecules move less and don't take up as much space. Therefore, the material they are in becomes more dense or "heavier."



COLD AIR IS MORE DENSE
COLD AIR SINKS

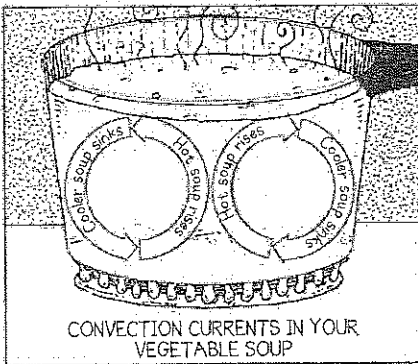
Convection is a process by which heat is transferred by movement of a heated fluid (a liquid or gas). In convection, a hot, less dense fluid rises up, and a cold, more dense fluid sinks, forming a convection cell.

Hot fluids are less dense, so they rise up. Color red for HOT.

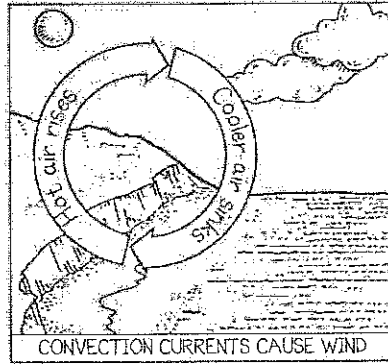
Cold fluids are more dense, so they sink. Color blue for COLD.

CONVECTION POWERS EXTREME WEATHER

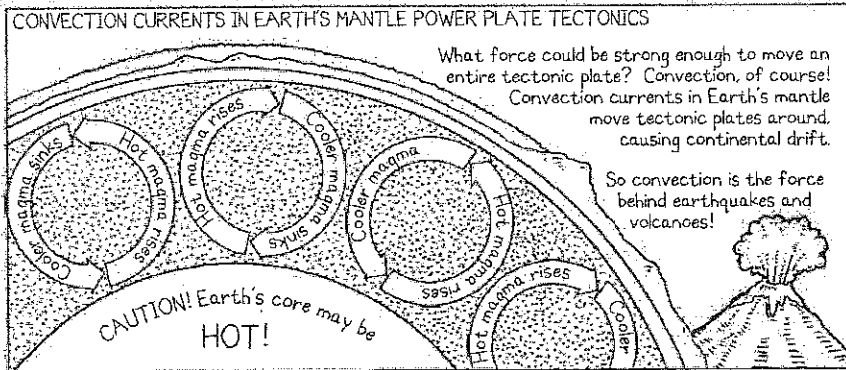
Strong convection cycles cause thunderstorms, tornadoes, and hurricanes.



CONVECTION CURRENTS IN YOUR VEGETABLE SOUP



CONVECTION CURRENTS CAUSE WIND

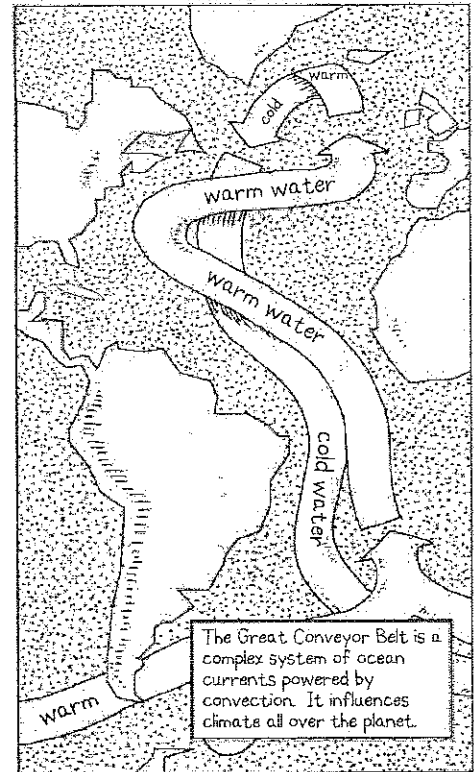


CONVECTION CURRENTS IN EARTH'S MANTLE POWER PLATE TECTONICS

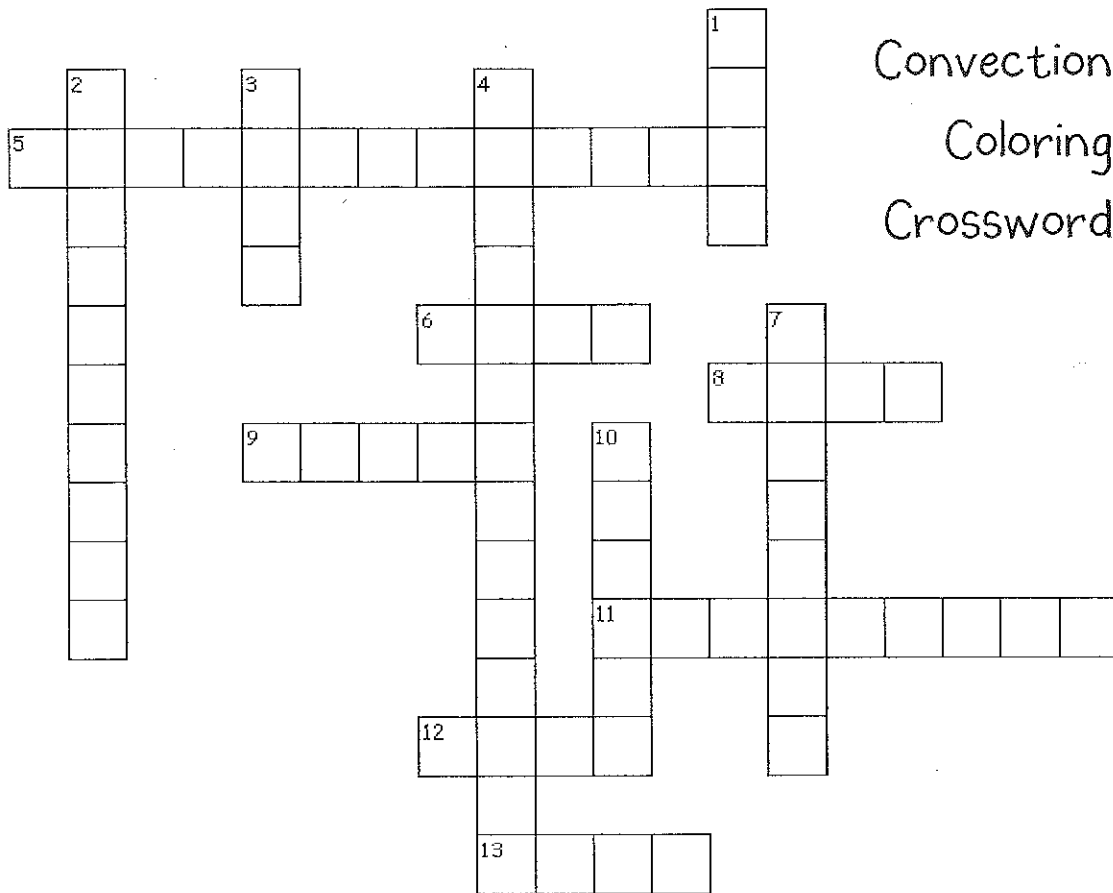
What force could be strong enough to move an entire tectonic plate? Convection, of course! Convection currents in Earth's mantle move tectonic plates around, causing continental drift.

So convection is the force behind earthquakes and volcanoes!

CAUTION! Earth's core may be HOT!



The Great Conveyor Belt is a complex system of ocean currents powered by convection. It influences climate all over the planet.



Convection Coloring Crossword

Across

5. A _____ is a manmade device that floats on air because the air inside of it is heated.
6. Chilled molecules move less so they take up _____ space.
8. Heated molecules move around so much that they can _____ right out of their container.
9. Hot gases and liquids float because they are less _____ than the gases and liquids around them.
11. Strong convection cycles can cause _____, violent storms with heavy wind.
12. Hot gases and liquids tend to _____ upward due to their low density.
13. In a pot, you might see convection currents in your _____.

Down

1. Cold air tends to _____ because it is more dense than the air around it.
2. _____ is a process by which heat is transferred by movement of heated fluid.
3. Convection causes moving air known as _____.
4. Convection currents in Earth's mantle power _____ when landmasses move around Earth's crust.
7. The "Great Conveyor Belt" is a complex system of ocean _____ powered by convection.
10. Volcanoes are caused by convection currents in the earth's _____.

Geologic Time Scale

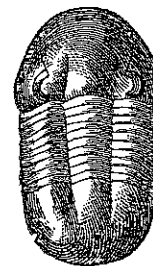
Different layers of rocks were formed at different times. The rocks at the bottom of the Grand Canyon are much older than the rocks near the top. This is the Law of Superposition. Scientists have been able to form a time line of the Earth's history by comparing rocks and fossils from all over the world. The division of Earth's history makes up the geologic time scale. They have divided Earth history into four main sections that we call eras.

The oldest time period is called the Precambrian Era. This period dates from 4.6 billion years ago to 570 million years ago. It takes up about 75 percent of the Earth's history. At this time, Earth's crust begins to form. Scientists believe that organisms of this era lived in shallow seas. They were very simple animals with no shells or bones, so they left very few fossils. Bacteria become known as the first life on Earth. Most of the evidence of life from that time is in the form of worm-like trails or burrows. These are known as trace fossils. Trace fossils are fossilized tracks and other evidence of the activity of organisms. They tell something about how these animals lived. Most Precambrian rocks are igneous or metamorphic rocks, which don't have as many fossils as sedimentary rocks do.

The next era was the Paleozoic Era. This period extended from 570 million years ago to 225 million years ago. Many Paleozoic animals were invertebrates, or animals without backbones, but they did have hard shell coverings, so lots of fossils have been found.

Trilobites, brachiopods, and sponges were common during this time. Warm, shallow seas covered much of the continents. Fish developed in these waters, and are considered to be the first vertebrates, or animals with backbones. Amphibians and land plants developed late in the Paleozoic Era. Vast swamps were found all along the coastlines of the continents. The vegetation that died was buried by sediment, and layer upon layer of this material built up.

Eventually, the organic matter turned into coal. At the end of the Paleozoic Era, many of the swamps dried up, and many species of amphibians became extinct. This is all the time period in which the Appalachian Mountains formed. In addition, all of Earth's land comes together to form a single landmass called Pangaea.



The third era was the Mesozoic Era, also called the age of reptiles. Reptiles became very abundant. They were less dependent on water than amphibians and fishes, so they could adapt to the drier environment. This era dates from approximately 225 million years ago to 65 million years ago. This was the time of the huge dinosaurs, the Brontosaurus and the Tyrannosaurus. It was also the time for much smaller ones that were much like our lizards of today. There was a coil-shelled animal that lived in the oceans at that time called the ammonite. It is a good index fossil for this era. Index fossils are the remains of species that existed on Earth



for relatively short periods of time, were abundant, and were widespread geographically. These fossils can be used by geologists to assign ages to rock layers. The first mammals and birds appear. Changes in Earth's crust cause Pangaea to slowly break apart. The Atlantic Ocean forms as North America separates from Africa and South America. The Mesozoic Era ended with a change of climate and the extinction of many animals, including dinosaurs and ammonites. Some scientists think these changes were rather abrupt. They may have been caused by a large meteorite striking the Earth.



The final era is the Cenozoic Era. Its time period begins 65 million years ago and continues today. This is a time when mammals have become the primary land animals and many flowering plants have developed. The first primates appear and a small stream begins carving the Grand Canyon. The Rocky and Himalayan Mountain ranges form. The Ice Age occurred during this time, and with it, we have seen the first signs of human life.

So, you see, by using dating methods and fossil remains, scientists are able to put together some idea of the Earth's history. There is still a lot that is unknown and a lot that we don't understand about the Earth's history. Maybe one of you will become a paleontologist and fill in missing details about the history of our planet.

Name: _____

Date: _____

Reading: Geologic Time Scale

Period: _____

1. The rock layers at the _____ are older according to the Law of _____.
2. Scientists use _____ and _____ to create a time line of Earth's history.
3. The division of Earth's history makes up the _____.
4. Scientists have divided Earth history into four periods that are called _____.
5. The four time periods are called:
a. _____ b. _____ c. _____ d. _____

- *****
5. The _____ Era is the oldest time period.
 6. The Precambrian Era makes up about _____% of the Earth's history.
 7. Describe the organisms that lived during the Precambrian Era:

8. _____ was the first life on Earth.
9. What are trace fossils? _____

10. Give 2 examples of trace fossils for this time period. _____

- *****
11. Many Paleozoic Era animals were _____ or animals with no backbones.
 12. The animals did have _____ during the Paleozoic Era, so many fossils have been found.

13. What are three common fossils that have been found?

a. _____ b. _____ c. _____

14. _____ developed in the warm, shallow seas and are considered to be the first vertebrates.
15. _____ are animals with backbones.

16. Later in the Paleozoic Era, _____ and _____ developed.

17. During this time period, swamp vegetation eventually died and got buried by sediments and turned the organic matter into _____, which is a sedimentary rock.

18. _____, the supercontinent, forms.

19. The _____ was called the Age of Reptiles.

20. During this era, _____ were roaming the earth.

21. The ammonite is a coil-shelled animal that lived in the oceans during this era and it is used as an _____.

22. The first _____ and _____ appear.

23. As Pangaea, the supercontinent, breaks apart, the _____ Ocean forms.

24. What were the 2 big changes at the end of the Mesozoic Era?

25. Scientists think that these changes were caused by a large _____ striking the earth.

26. The _____ is the final era.

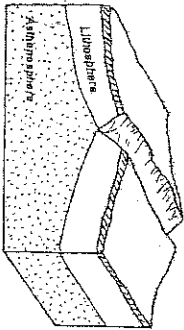
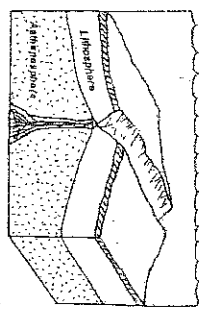
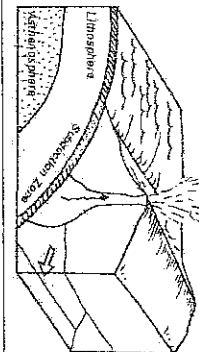
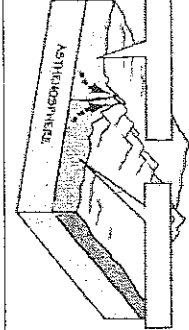
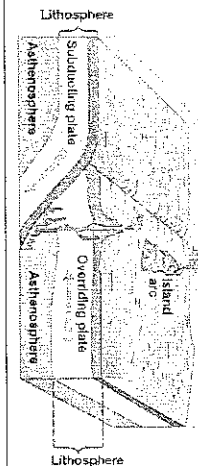
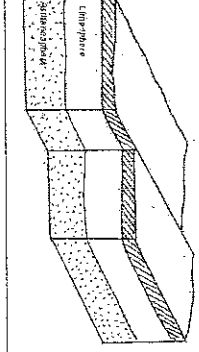
27. _____ were the main land animals found during this time and _____ plants also developed.

28. The _____ also occurred during this time.

29. The first signs of _____ were found during the Cenozoic Era.

30. What do paleontologists do? _____

31. Why are there missing pieces in Earth's history? _____

Type of Boundary	Label the types of crust, arrows showing direction of movement & effects.	Description	Examples
<p>Divergent Continent - Continent</p>			
<p>Divergent Ocean - Ocean</p>			
<p>Convergent Ocean - Continent</p>			
<p>Convergent Continent - Continent</p>			
<p>Convergent Ocean - Ocean</p>			
<p>Transform</p>			

Geological Events on the Earth's Surface

Name _____ Date _____

Type of Boundary	Label the types of crust, arrows showing direction of movement & effects	Description	Examples
Divergent Continent - Continent			
Divergent Ocean – Ocean			
Convergent Ocean – Continent			
Convergent Continent – Continent			
Convergent Ocean – Ocean			
Transform			