

Name _____

Fossil Evidence

Background

Fossils are the preserved or mineralized remains or imprint of an organism that lived long ago. They also provide an actual record of the Earth's past life-forms. Evolution or change over time can be seen in the fossil record.

Most fossils are found in sedimentary rock. Sedimentary rocks are formed when exposure to rain, heat, and cold breaks down existing rocks into small particles of sand and clay, or otherwise known as sediments. These particles are carried by streams and rivers into lakes or seas. Because the particles are heavier than water, they eventually settle to the bottom of the lake or stream. Here they build up in layers upon layers of sediments. Dead organisms, carried in the water, also eventually fall to the bottom. The organisms can become embedded in the sediment layers. As sediments pile up, pressure on the lower layers compresses the sediments and slowly turns them into rock, which thus preserves the remains of the dead organisms.

The geological Law of Superposition states that older layers of sedimentary rock lay beneath younger layers. Scientists use this law to determine the order in which organisms appeared and disappeared in the fossil record. The law cannot be used to determine the absolute age of rock layers. (It cannot tell us the rock is 100 million years old). It can be used to determine the relative ages of rock layers by comparing their fossil records.

1. Describe how fossils are made.

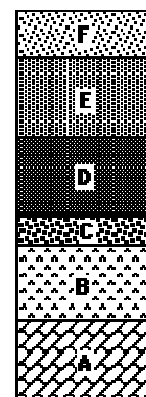
2. What is the law of superposition?

3. True/False. The law of superposition can determine the absolute age of rock layers. Explain your answer

4. Use the diagram to the right. This is a side view of sedimentary rocks in the Earth's crust. Which layer:

- | | |
|--|---|
| a. is the oldest? _____ | d. was formed first? _____ |
| b. was formed last? _____ | e. is the youngest? _____ |
| c. has life forms most like today? _____ | f. has life forms least like today? _____ |

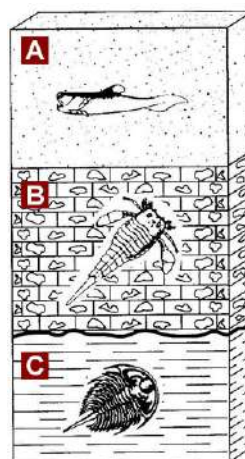
Stratigraphic Column



5. **Index fossils** are fossils of organisms that lived during only 1 short period of time, therefore they are only found in one layer of rock. The following diagrams represent two rock outcrops found several miles apart in New York State.

- Which layers are the same? _____
- Of the rock layers E and F, which is the oldest?

- An unconformity (buried erosional surface) is represented by the interface between which two layers? _____
- What can we conclude about the age of the rock layers of rock that contain the same index fossils?



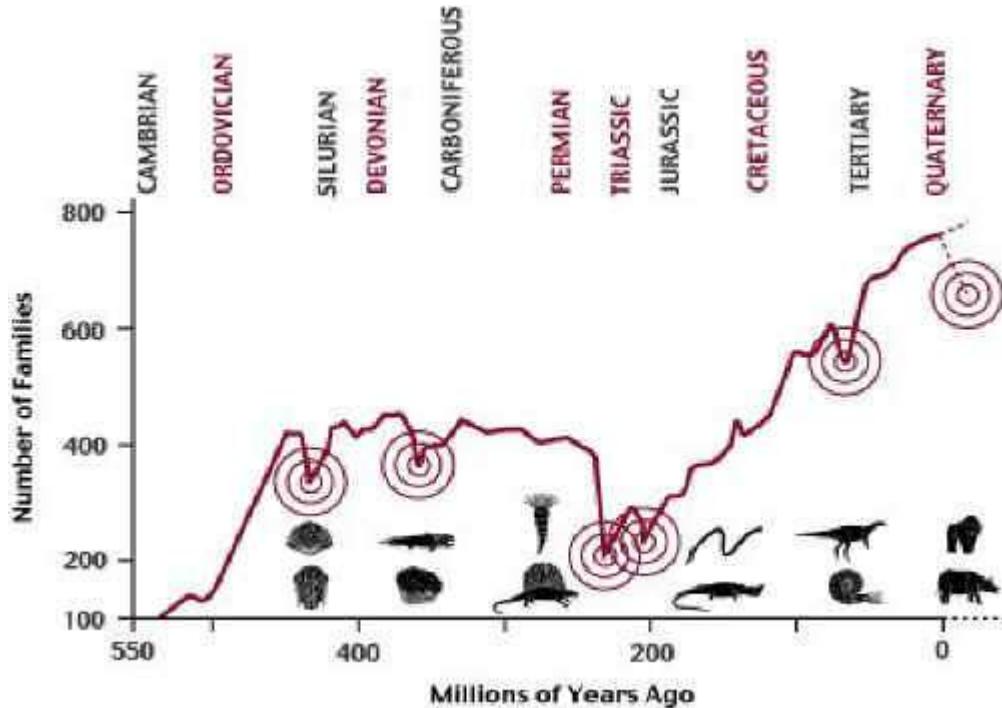
Outcrop 1



Outcrop 2

Mass Extinction in the History of Life

The fossil record profiles mass extinctions, where many different species become extinct, during many periods of geological time. Some are indicated by the circled regions on the graph below. Notice that biological diversity has always rebounded in the aftermath of mass extinctions, causing the biological make-overs that define the boundaries of the geological periods and eras.



Use the figure above to answer the following questions.

1. Which period appears to have the most number of families of species? _____
2. Which period appears to have the least number of families of species? _____
3. Write a statement about the pattern you notice in the number of families of species in the history of the Earth. _____
4. Which period had the greatest mass extinction? _____
5. In which period was there the start of the biggest explosion of different organisms? _____
6. Approximately how many families of species were there at the
 - a. start of this explosion _____
 - b. end of this explosion _____
7. Approximately how many families of species are there at the present time? _____