

Activity 7.0 The Earth's History

B.

1. What are the different subdivisions of the geologic time scale?

The subdivisions of the geologic time scale include the following:

- **Eons:** the largest division, also referred to as a time interval that is one billion years long
- **Eras:** many time periods separated by significant global change in life diversity
- **Periods:** are further subdivided into epochs. In comparison to other eras, they encompass a profound alteration in living forms
- **Epochs:** units of periods that are subdivided into units of age. Usually used to divide the *Paleogene*, *Neogene*, and *Quaternary* eras.
- **Ages:** units of epochs

2. How old is the Earth in billion years?

The estimated age of the earth is 4.6 billion years.

3. What part of the Earth's evolution (what eon) is NOT supported by evidence (fossils) preserved in rock?

While the Precambrian Eon as a whole has limited evidence due to several factors like erosion, tectonic activity, and the lack of well-preserved rocks, the **Hadean Eon** more specifically is not supported by fossils preserved in rocks. In comparison, the Archean and Proterozoic Eons both under the Precambrian eon have had fossils of stromatolites and bacteria respectively.

4. What fraction (numerical answer) of Earth's evolution has been influenced by humans?

2 million years of the Earth's evolution were influenced by humans out of its billion years of existence.

5. When (in million of years ago or mya) did the primitive atmosphere become oxygen-rich?

The primitive atmosphere became oxygen-rich about ca. 2300 million years ago.

6. Why is the eon after the Proterozoic Eon called the Phanerozoic Eon?

In the Greek language, Phanerozoic means visible life. Since several rocks and deposits discovered had fossils that assisted in documenting significant trends in the history of Earth's revolution, this has been appropriate for the specific eon. This era had the greatest increase in life. The Paleozoic, Mesozoic, and Cenozoic eras are its divisions.

7. In what geologic period did life increase dramatically?

The Cambrian Period is known for the dramatic growth of life, known as the "Cambrian Explosion." Animals such as chordates, arthropods, and brachiopods appeared at this time.

8. In what period were major coal beds developed?

The Carboniferous Period saw the development of significant coal deposits.

9. In what era did the dinosaurs rule Earth?

The dinosaurs dominated Earth throughout the Mesozoic Era.

10. Which epoch was the development of man recorded/recognized?

The Pleistocene Epoch was the time when early man's existence was confirmed.

11. What global phenomenon marked the Ordovician-Silurian interphase?

In this interphase, global warming and global cooling caused 86% of the remaining life of it to be gone, including minuscule marine animals like brachiopods and bryozoans.

12. What global phenomenon marked the Devonian-Carboniferous interphase?

During this interphase, 75% of life was lost including the last populations of brachiopods, trilobites, and reef-building animals that endured during the Ordovician-Silurian interphase, along with other fish species that flourished in the Devonian Period which was smothered by the oxygen provided by oceanic algae.

13. What global phenomenon marked the Permian-Triassic interphase?

96% of life including a variety of marine animals and several vertebrates became extinct during the Permian-Triassic interphase, caused by global warming resulting in changes in the oceans and volcanic activity.

14. What global phenomenon marked the Cretaceous-Paleocene interphase?

All dinosaurs became extinct during the Cretaceous-Paleocene interphase along with 60-76% of all life on Earth due to an asteroid collision. The collision caused widespread environmental disturbances, including massive wildfires, tsunamis, and a "nuclear winter" effect, leading to a temporary cooling of the earth's climate.

15. Why is the start of the Holocene considered as the initiation of another extinction period?

The start of the holocene includes the proposed new epoch "Anthropocene" highlighting the dominant role of human activities in shaping Earth's ecosystems. Human activities, including habitat destruction, pollution, over-exploitation of resources, and climate change, have led to declines in many species and ecosystems worldwide. Some scientists argue that the scale and pace of these changes are comparable to or even exceed those of previous mass extinction events.