The Geologic Time Scale

Historians sometimes name time periods after unique characteristics or remarkable events—the Ming Dynasty, for example. Similarly, geologists divide Earth's past into time periods based on distinguishing traits. Scientists have reconstructed Earth's extensive past by using geological evidence, sophisticated dating techniques, and deductive reasoning. Like the periodic table of elements, the time scale is a useful organizational tool.

Division of Geologic Time

A geologist studying the rocks in an area can use rules, such as the principle of superposition, to determine the relative ages of the rocks. By correlating rocks over large areas, geologists have determined the relative ages of most of the rocks on Earth's surface. Over many years, geologists have used rock formations to develop a time scale that divides geologic time into units.

The geologic time scale (pages 668–669) is a summary of major events in Earth's past that are preserved in the rock record. Although several slightly different versions of the time scale exist, all are based on evidence. Fossils are an important part of the history. In fact, many rock layers have been identified and matched based on the fossils they contain.

Geologic time is divided into eons, eras, periods, and epochs. As the first division, the eon represents the longest segment of geologic time. The Archean Eon (ahr-KEE-uhn) is the oldest, beginning with the formation of Earth's crust almost 4 billion years ago. The earliest known rocks formed during this eon. The Proterozoic Eon (PROHT-uhr-uh-ZOH-ihk) began about 2.5 billion years ago. Rocks from this time contain the earliest fossils, simple organisms that lived in the oceans. No fossil evidence of life on land has been found from this eon.

The most recent eon, the Phanerozoic (FAN-uhr-uh-ZOH-ihk), is characterized by signs of visible life. It is subdivided into three eras.