

Geologic Time

Objectives:

- To visually portray the magnitude of geologic time since the Earth's formation.
- To help understand the relative chronology of certain "milepost" events.
- To clarify misconceptions about geologic history (e.g., when dinosaurs lived).

Activity type: Activity

Grade level: 4–12

Illinois Learning Standards:

11.A.1; 2; 3d

12.E.2b; 3a; 4b

13.B.1b

Standards assignment:

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Materials:

white or light-colored rope, 24-feet long (a 12-foot rope can be used, but divide all measurements by 2)

black marking pen

cardboard placards or poster board

ribbon or heavy string

measuring tape or stick

Preparation:

The entire 24-foot rope corresponds to all of geologic time from the formation of the planet until the present (4.6 billion years). Use the marking pen to mark the rope every 2 feet, thus dividing the rope into 12 segments. If you like, you can compare the 12 segments to the 12 calendar months (see GeoActivity PRIN-2: Cosmic Calendar). Ten placard or poster boards are used to make signs for specific geologic events in Earth's history. These placards are numbered, so that the events are in chronological order (optional), and corresponding numbers are written on tags tied to the rope at specified lengths. Students may illustrate the placards.

Rope Length	Geologic Event	Calendar Comparison	Millions of Years Ago
0 ft	Origin of planet Earth	00:00:01 on January 1	4600
5 ft	Oldest rocks found at surface	mid-March	3600
10 ft	Earliest sea life	early May	2000
21 ft 1 in	Beginning of Paleozoic Era	late November	540
22 ft	Coal deposits formed	early December	300
22 ft 10 in	Beginning of Mesozoic Era	about December 10	245
23 ft	Dinosaurs become dominant	about December 15	190
23 ft 7 in	Beginning of Cenozoic Era	December 26	65
23 ft 11 in	"Ice Age"	1 min 15 sec before midnight on December 31	2.5
24 ft	All recorded human history	about 11:59:45 until midnight on December 31	6000–0 yrs

Procedure:

Ask for ten volunteers to come to the front of the room and give each one a placard. Spread out the 24-foot length of rope and ask the volunteers to help hold up the rope at the location corresponding to their placard (numbers are on the ribbons on the rope and on the back of each placard).

Congestion will occur in the area of the rope representing the more recent geological record (Paleozoic Era to the present). This congestion is part of the visual impact showing how these major Earth events have all occurred in the relatively "recent" time of Earth's history. The person with the youngest placard (No. 10, All Recorded Human History) is told to just place a finger against the end of the rope.

Once all the volunteers are in position, the instructor(s) can go to each position and briefly discuss the geologic event. Mention that it was the science of geology that first presented the evidence for the age of the Earth and provided the interpretation of the chronology of events in this history. Mention that it would take four or five additional ropes of this length to record all time back to the formation of the universe (about 16 billion years ago). Discussion could possibly include how we know the timing of the event and what factors may have caused the event (such as Mesozoic-Cenozoic transition). Use this activity to field questions related to geologic time.

Alternate designs:

Numerous variations on this design are possible. For example, additional placards could be made to highlight additional events in Earth's history. Or, a rope could be made showing only geologic time since the beginning of the Paleozoic Era, or only for the Cenozoic Era. Other time line activities may be found on the Kentucky Geological Survey web site: <http://www.uky.edu/KGS/>.

Geologic eras:

Cenozoic (recent life): 65 million years ago to present time

Mesozoic (middle life): 245 million years ago until 65 million years ago

Paleozoic (ancient life): 540 million years ago until 245 million years ago

Precambrian: All geologic time before the Paleozoic

Related activity:

GeoActivity PRIN-2: Cosmic Calendar

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