

Geological Timeline Activity

/30

Significant developments and extinctions of plant and animal life can be shown on a geologic time scale.

How can geological time be represented? To understand evolution, humans must think in units of time much larger than those we use to define our lives. After all, evolutionary change occurs too slowly to be measured in days, months, or years. Instead, it's documented in layers upon layers of rock deposited over the course of 4.6 billion years.

The earth has been significantly altered during this time by climate swings, volcanism, drifting continents, and other "earth shattering" events. These dynamic conditions, in turn, have influenced every living thing that has inhabited the planet. Because of this, biology alone cannot fully explain the evolution of life on our planet. It's necessary to include the physical sciences -- geology, chemistry, and physics -- in order to understand the conditions in which life arose and evolved.

The story of life is told primarily by its victims. Scientists say that only one in a thousand species that have ever lived survives today. The other 99.9 percent are extinct, gone forever. With few exceptions, the lifespan of individual species is short by geological standards, on average between 2 and 10 million years. No matter how well adapted a creature is to its environment, history has shown that even the most dominant can be wiped away. Ironically, extinction is a springboard to other life. Even in the most catastrophic of events, species survive and continue to evolve, often filling niches left by the victims.

Extinction is by and large a natural process in which species, groups, and even whole families of organisms disappear. Background extinctions, which are ongoing throughout the history of life, eliminate one family every million years or so. The more destructive and relatively sudden kind of extinction -- the mass extinction event -- is caused by environmental influences and has a global impact on diversity. All extinctions identified in this timeline are mass extinction events. By creating a geological timeline evolutionary events and mass extinctions can be represented visually.

Procedure

Materials: groups of 2-4

Stock Table:

Adding Machine Paper Roll

- 6 meters total / group

- pre-measured

Meter Stick

Scissors

Clear Tape

Group:

Cloth Measuring Tape

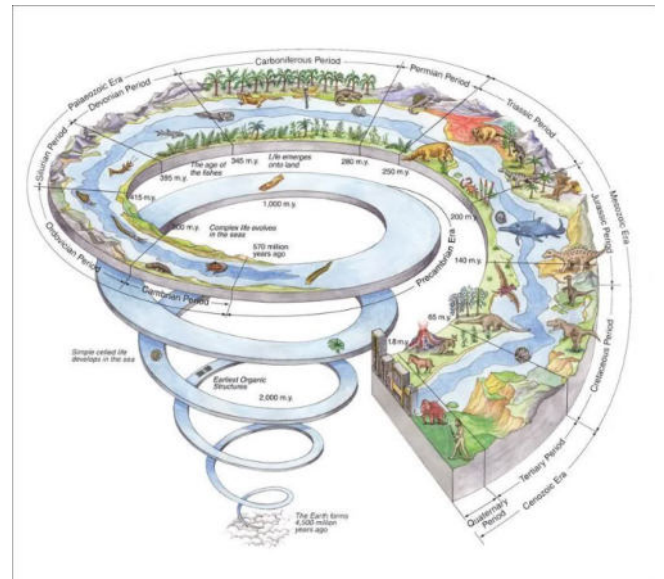
- metric/150 cm

Meter Stick

Pencil (not pen/marker)

Paper Clips (maintain roll)

References



Steps:

1. Gather all materials as directed.
2. Using a measuring stick (or 2 classroom desks that are together ~ 3 meters long) and a pair of scissors, measure out and cut ~ 6 meters of adding machine paper.
3. Tape down ONLY one end of the machine paper to the end of your table.
4. Using the cloth measuring tape, measure 20 cm's from of the end of your paper tape. At the 20 cm mark, place a dot. On top of the dot write the word, "Today" vertically; this is the starting "0 cm" point.

5. Starting at the “Today” dot, do the following:

- Use the cloth measuring tape to measure the first increment scale (0.3 mm) from the “Today” dot (0 cm).
- Write above the dot (~315 tya / “Homo Sapiens”); thus, the time and event vertically.
- Repeat for each time/event starting at the “Today” dot.
 - *Note: Be precise and you’ll have to use the meter stick along with the cloth tape towards the end*
- Include 10+ “drawings” along with any time and event you wish.

6. When complete, put away all materials as directed. Be prepared to show/share your timeline.

FYI: 1 millimeter = 1 million years; 1 centimeter = 10 million years; 1 meter = 1 billion years

Major Events in Geological Time

Time	Scale	Major Event	Eras / Eon
Today	0 cm	Today	
~ 315 tya	0.3 mm (from 0 cm; <u>same for future events</u>)	Homo Sapiens	Cenozoic
~ 22 mya	2.2 cm	Grasses	
~ 33 mya	3.3 cm	Apes	
~ 50 mya	5 cm	Horses	
~ 65 mya	6.5 cm	CENOZOIC Era	
~ 66 mya	6.6 cm	Asteroid Hit	Mesozoic
~ 140 mya	14 cm	Flowers	
~ 200 mya	20 cm	Earthworms	
~ 220 mya	22 cm	Mammals	
~ 240 mya	24 cm	Dinosaurs	
~ 248 mya	24.8 cm	MESOZOIC Era	
~ 330 mya	33 cm	Winged Insects	Paleozoic
~ 380 mya	38 cm	Insects	
~ 390 mya	39 cm	Sharks	
~ 395 mya	39.5 cm	Amphibians	
~ 400 mya	40 cm	Ferns	
~ 416 mya	41.6 cm	Jawed Fish	
~ 470 mya	47 cm	Land Plants	
~ 542 mya	54.2 cm	PALEOZOIC Era	
~ 550 mya	55 cm	Jellyfish	Precambrian
~ 1.8 bya	1 m + 8 cm (use meter stick + tape)	Eukaryotes	
~ 2.4 bya	2 m + 40 cm	Oxygen	
~ 3.5 bya	3 m + 50 cm	Prokaryotes	
~ 4.5 bya	4 m + 50 cm	Earth and Moon Form	
~ 4.6 bya	4 m + 60 cm	PRECAMBRIAN Eon	