

Geologic Timeline - Group Procedure

Learning Target: Evolution - Analyze and interpret the existence, diversity, extinction, and change in life forms throughout the history of the Earth.

In this project, we will be learning how old Earth is and how long it has taken for life to develop to where it is today. We will also be looking at the major events in Earth's history including the atmosphere, mass extinctions, geologic and climate events that have had an effect on how life has evolved.

Overview: We will create a 4.6 meter timeline modeling Earth's history. The first 3.6 billion years will be done as a group. Each one of you will be creating a timeline of the most recent billion years (1.0 meter).

Materials

- ◆register tape (group = 4.0 meters; each student = 1.0 meter)
- ◆Geologic time scale (handout)
- ◆meter stick / ruler
- ◆pencil and marking pen (like an ultra-fine point sharpie)
- ◆colored pencils or markers

mya = millions of years ago
my = million years
bya = billions of years ago

Scaling the timeline

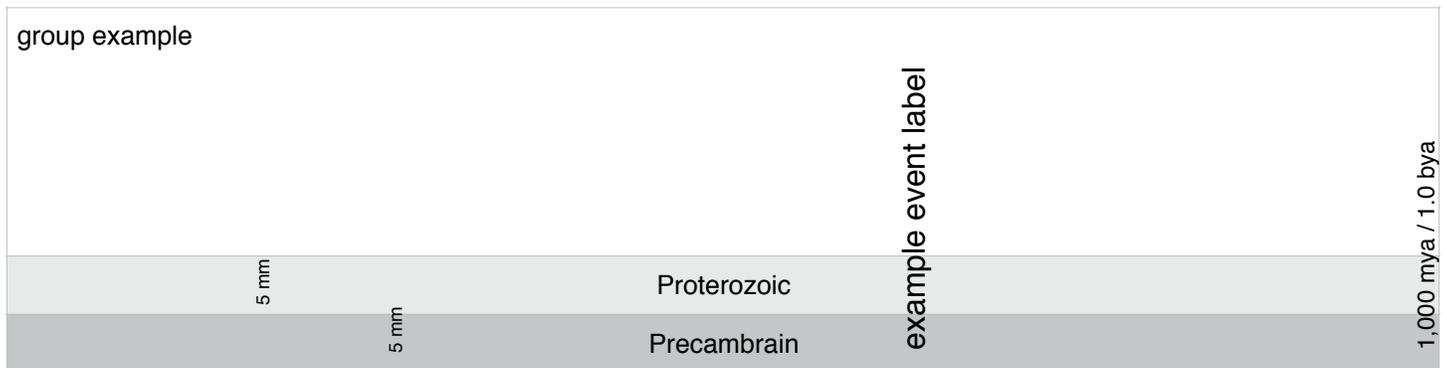
Use the scale below to complete the table. Use the values to help you set-up your timeline.
1 millimeter = 1 million years ; 1 centimeter = 10 million years ; 1.0 m = 1 billion years

Geologic Era	Time Range	Total Time (millions of years) mya	Timeline length (cm)	Color (your choice)
Cenozoic Era	65 mya-present	65 million years (my)	65 mm = 6.5 cm	
Mesozoic Era	250-65 mya			
Paleozoic Era	540-250 mya			
Precambrian Era	4600-540 mya 4.6 - 0.54 bya			

Group Timeline Procedure

1. As a group, measure out a 4.0 m piece of register tape. Use books or lightly tape it down to the table.
2. The right end of your register tape is 1,000 mya (or 1 billion years ago). This means your group timeline will only include the *precambrian* era.

3. Using the scale, **label** every 500 million years (0.5 billion) on the bottom of the paper going back in time. Do this for the entire tape. You are just setting up the timeline, so label in pencil at this point. Use mya for millions of years ago (ex: 500 mya). You can also label in billions of years.
4. Look at the Geologic Time Scale on the next page. Measuring from the bottom of the register tape, draw a horizontal line 5 mm high for each era. Also, make another 5mm line above it to label the periods. See the example below.
5. Color and label the timeline. Use different colors for each era and period and try to use lighter colors or shade lightly. Label each era in the color using a marking pen (such as an ultra-fine point sharpie).



6. Add the events below to your group timeline.
 - a. 4,600 mya (4.6 bya) - Earth is formed
 - b. 3,900 mya - heavy bombardment (of Earth by meteorites and comets)
 - c. 3,800 mya - first life arises on Earth (bacteria)
 - d. 3,000 mya - cyanobacteria well-established
 - e. 2,500 mya - plate tectonics begins
 - f. 2,200 mya - snowball Earth 1

Geologic Time Scale

Era	Period	Time (approximate)
Cenozoic		Present - 65 mya
	Quarternary	Present - 1.6 mya
	Tertiary	1.6 mya - 65 mya
Mesozoic		65 mya - 250 mya
	Cretaceous	65 mya - 146 mya
	Jurassic	146 mya - 200 mya
	Triassic	200 mya - 250 mya
Paleozoic		250 mya - 540 mya
	Permian	250 mya - 300 mya
	Carboniferous	300 mya - 359 mya
	Devonian	359 mya - 416 mya
	Silurian	416 mya - 445 mya
	Ordovician	445 mya - 490 mya
	Cambrian	490 mya - 540 mya
Precambrian		540 mya - 4600 mya (4.6 bya)
	Proterozoic	540 mya - 2500 mya
	Archean	2500 mya - 3800 mya
	Hadean	3800 mya - 4600 mya