

# Lab: Geological Time Scale Activity

## HONORS BIOLOGY: CHAPTER 12

**BACKGROUND:** The study of evolution of plants and animals in the last 600 million years has been accomplished by the study of fossils. A paleontologist is a scientist who studies fossils. Dating of a fossil specimen has been done by radioactive dating. A geologist is a scientist who looks at the formation of rocks and studies the various mineral combinations found within rocks. The purpose of this activity is to take an in depth look at the transitions that have occurred regarding plants and animals within the last 580 million years.

### MATERIALS:

- Meter stick
- 1.3 meter long piece of adding machine tape
- Colored pencils

### PROCEDURE:

1. Fill in the data table using the following scale as a constant **.2 cm=1million years**
  2. Using the data from the table create a time line displaying each of the geological periods.
  3. Use a broad band of color to indicate the different eras that the periods exist in.
  4. Label the time line with the name of period and the number of years from present from which it occurred.
  5. Draw a plant and animal species in each of the sections (periods) that is representative of the period being displayed and color the specimens.
- Note: the Carboniferous period consists of the Pennsylvanian and the Mississippian periods.*
6. Answer the Conclusion questions when you have completed your timeline.

PERIOD	MILLION YEARS	FACTOR	DISTANCE in cm
Quaternary	2.5	.2	
Tertiary	65	.2	
Cretaceous	135	.2	
Jurassic	195	.2	
Triassic	245	.2	
Permian	285	.2	
Carboniferous	345	.2	
Devonian	400	.2	
Silurian	430	.2	
Ordovician	500	.2	
Cambrian	580	.2	

## CONCLUSION QUESTIONS:

1. Complete the following chart.

	<b>ERA</b>	<b>PERIOD</b>
Earliest fish		
Earliest mammal		
Earliest flowering plant		
Earliest human		
Earliest Dinosaur		
Earliest amphibians		

2. Which era lasted for the longest period of time? How long was it?

3. Which era lasted the shortest period of time? How long was it?

4. Which era do we live in and when did it start?

5. Does the timeline display gradualism or punctuated equilibrium, explain your answer?

6. What is the difference between a paleontologist and a geologist?
  
7. In which era did life begin? What type of environment did they live in?
  
8. Geologists have just announced that we have entered a new epoch; the Anthropocene Epoch. What does the term Anthropocene mean? Hypothesize what must be happening on the planet for a new era to be named, discuss what conditions and/or actions have caused the change.
  
9. What caused species to rapidly evolve after each new era?
  
10. Explain in terms of natural selection why species similar to Alligators didn't go extinct during the mass extinction between the Mesozoic and Cenozoic eras?

# Geologic Time Scale

Era	System & Period	Series & Epoch	Some Distinctive Features	Years Before Present
<b>CENOZOIC</b>	<b>Quaternary</b>	Recent	Modern man.	11,000
		Pleistocene	Early man; northern glaciation.	1/2 to 2 million
	<b>Tertiary</b>	Pliocene	Large carnivores.	13 + 1 million
		Miocene	First abundant grazing mammals.	25 + 1 million
		Oligocene	Large running mammals.	36 + 2 million
		Eocene	Many modern types of mammals.	58 + 2 million
		Paleocene	First placental mammals.	63 + 2 million
<b>MESOZOIC</b>	<b>Cretaceous</b>		First flowering plants; climax of dinosaurs and ammonites, followed by Cretaceous-Tertiary extinction.	135 + 5 million
	<b>Jurassic</b>		First birds, first mammals dinosaurs and ammonites abundant.	181 + 5 million
	<b>Triassic</b>		First dinosaurs. Abundant cycads and conifers.	230 + 10 million
<b>PALEOZOIC</b>	<b>Permian</b>		Extinction of most kinds of marine animals, including trilobites. Southern glaciation.	280 + 10 million
	<b>Carboniferous</b>	Pennsylvanian	Great coal forests, conifers. First reptiles.	310 + 10 million
		Mississippian	Sharks and amphibians abundant. Large and numerous scale trees and seed ferns.	345 + 10 million
	<b>Devonian</b>		First amphibians; ammonites; fishes abundant.	405 + 10 million
	<b>Silurian</b>		First terrestrial plants and animals.	425 + 10 million
	<b>Ordovician</b>		First fishes; invertebrates dominant.	500 + 10 million
	<b>Cambrian</b>		First abundant record of marine life; trilobites dominant.	600 + 50 million
	<b>Precambrian</b>		Fossils extremely rare, consisting of primitive aquatic plants. Evidence of glaciation. Oldest dated algae, over 2,600 million years; oldest dated meteorites 4,500 million years.	