

NAME: _____ PERIOD: _____ DATE: _____

LAB PARTNERS: _____ LAB # 25

GEOLOGIC HISTORY TIMELINE

INTRODUCTION

The Earth has changed dramatically and repeatedly over a history that spans 4.6 billion years. Such immense spans of time are difficult for most of us to comprehend. They fall outside of our range of human experience. We normally deal with much shorter time intervals, like the time of our next class or the number of days until the next test, or even the number of years until graduation. It is important for students of science to expand their sense of time. Extremely slow geologic processes, considered only in terms of human experience, have little meaning. To appreciate the magnitude of geologic time and the history of our incredible planet, you will be creating a timeline of important geologic events scaled to a size more tangible and familiar. A scale model means that the timeline accurately depicts different lengths of time. All of the times that we are going to deal with in this lab are in millions of years ago (*mya*).

MATERIALS

50ft of string marked at intervals of every 1ft equals 100 million years
Pictures of geologic events (provided by teacher, not included in lab)
Clothes pins
Earth Science Reference Tables
Calculator

APPROXIMATE TIME 2 periods

OBJECTIVES

1. To create a scale model of the entire history of the Earth.
2. Practice using page 8 and 9 of the Earth Science Reference Table.

PART 1

PROCEDURES:

1. Wrap the 50ft string around the classroom denoting the beginning of the Earth to present day (this should be done already by your teacher).
2. Each group receives pictures of different events in Earth's history.
3. Using the ESRT, on each picture write in the approximate time in millions of years (*mya*) of when the event occurred.
4. Each member of the group, using a clothes pin, will take at least one picture and place it on the timeline where that event occurred.
5. Once all lab groups have finished placing their events on the timeline, one person from each group will check to make sure each event is the correct location on the timeline.
6. Using the completed timeline and the ESRT answer the laboratory questions.

LABORATORY QUESTIONS:

1. How many millions are there in a billion? _____
2. How many millions of years ago did the Earth form? _____
3. How many millions of years ago did the Solar System form? _____

4. What percent of the timeline falls in the Precambrian Era? (Show all work using formula)
 $[Length\ of\ Precambrian\ era \div total\ age\ of\ Earth] \times 100$
5. What percent of the Earth's history have humans been in existence? (Show all work using formula)
 $[Length\ of\ Human\ Existence \div total\ age\ of\ Earth] \times 100$
6. In what eon are most of the events in Earth's history? _____
 Why? _____

PART 2

Fill in the charts and questions using page 8 and 9 of the Earth Science Reference Table:

	Epoch	Period
a) Earliest coral groups		
b) Earliest insects		
c) Diverse bony fishes		
d) Earliest fish		
e) Earliest birds		
f) Earliest reptiles		
g) Humans		
h) Earliest trilobites		
i) Eurypterids abundant		
j) Earliest sharks		

	Epoch	Period
a) Catskill delta forms		
b) Uplift of Adirondack region begins		
c) Iapetus Ocean deposition		
d) Initial opening of the Atlantic Ocean		
e) Pangea begins to break up		

1. During which geologic period did the Acadian Orogeny take place? _____
2. What was the cause of the Acadian Orogeny? _____
3. During which geologic era were the first amphibians present? _____
4. Determine the length in millions of years of the Mesozoic Era. _____
5. Which era in the Phanerozoic eon was the longest in duration? _____
6. During which geologic period did the index fossil *Eospirifer* exist? _____
7. How many millions of years ago did the Phanerozoic Eon begin? _____
8. How many millions of years did the Jurassic Period last? _____
9. What geologic period did Earth's first forest form? _____
10. Give the approximate location of North America and Western New York 359 million years ago. _____
11. How many millions of years ago were the first flowering plants? _____
12. Which mountain range was a result of the collision of North America with Africa?

13. Approximately how many millions of years have humans lived on Earth? _____
14. Which geologic era held the existence of the dinosaurs? _____
15. Determine the length of the Devonian period in millions of years. _____
16. Name the index fossil from the Cambrian period? _____
17. How many millions of years ago did the Silurian Period begin? _____
18. How many millions of years ago did the Paleogene Period end? _____
19. State the era in which the Catskill delta formed. _____
20. Why are there no bird fossils found in rocks formed during the Ordovician period?

21. What would be considered a good index fossil from the Triassic Period? _____
22. Which period in geologic history did Pangea begin to break up? _____
23. During which orogeny did the Hudson Highlands form? _____

24. State the two geologic periods in which the northeast part of North America experienced a continental collision in the Phanerozoic Eon. _____ and _____
25. How many millions of years ago did oxygen enter the atmosphere? _____
26. Why are there no rocks from the Permian period in NYS? _____

27. How many millions of years are the oldest known rocks on Earth? _____
28. What biological events occurred that separates the three Eras in the Phanerozoic Eon? _____

29. How many millions of years did the Paleozoic Era last? _____
30. During which geologic period were salt and gypsum deposited in the evaporite basins in New York? _____
31. During which geologic period did placoderm fish become extinct? _____
32. List the following in order from oldest to youngest using numbers from 1 - 12

*Birds / Modern mammals / Grasses / Stromatolites / Fish / Insects / Sharks /
Trilobites / Reptiles / Humans / Dinosaurs / Multicellular Soft-bodied Organisms*

Oldest

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Youngest