Name Date

**Geologic Timescale Lab**

**Purpose**

To create a to scale geologic timescale to better understand the relative history of Earth.

**Required Equipment and Supplies**

adding machine tape ruler meterstick

**Discussion**

The Earth has changed dramatically and repeatedly over a history that spans nearly 5 billion years. Such immense spans of time are difficult for most of people to comprehend. They fall outside the range of human experience. A geologic event is known by looking at rocks, which contain fossils and other information.

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 Earth, each group will create a timeline of important geologic events scaled to a size more tangible and familiar.

**Preliminary Questions**

1. How many millions are there in a billion?

2. The timeline will be 4.56 meters long to represent the 4.56 billion years of Earth’s history.

 a. How long would 1 billion years be on the timeline?

 b. How many years would 100 cm (1 meter) represent?

 c. How many years would 1 cm represent?

**Procedure**

1. Measure out a strip of adding machine tape 4.56 meters long.

2. Select one end of the tape to represent the present. Beginning at this end, mark off each billion years as 1 billion, 2 billion, etc.

3. Using the years given in Geologic Time Scale in the Data & Observations section on the next page, convert the years into distance measurements using the scale devised in the preliminary questions. Make sure to include units.

4. Starting from one end of the scale, mark all of the events on the timeline shown in the Geologic Timescale. For each event write the event number, years before present, and event directly on the timeline.

5. Answer the questions in the Analysis section.

**Data & Observations**

**Geologic Time Scale**

|  |  |  |  |
| --- | --- | --- | --- |
| **Event #** | **years before present** | Event | Distance from Present |
| 1 | 4.56 billion | Earth forms |  |
| 2 | 4.4 billion | Oldest mineral grain found |  |
| 3 | 4.1 billion | Oldest piece of rock ever found |  |
| 4 | 3.9 billion | Oldest evidence of a continent |  |
| 5 | 3.8 billion | First evidence of life |  |
| 6 | 3.5 billion | First fossils (algae and bacteria) |  |
| 7 | 1.8 billion | Free oxygen in atmosphere |  |
| 8 | 1.1 billion | First fossil of a complex organism (a worm) |  |
| 9 | 540 million | First abundant life found in the rock record |  |
| 10 | 460 million | First fish |  |
| 11 | 440 million | First land plants |  |
| 12 | 410 million | First land animals |  |
| 13 | 250 million | Largest mass extinction occurs |  |
| 14 | 247 million | First dinosaurs |  |
| 15 | 240 million | First mammals |  |
| 16 | 220 million | Breakup of super-continent Pangaea begins |  |
| 17 | 145 million | First flowering plants |  |
| 18 | 65 million | Dinosaurs and other animals go extinct |  |
| 19 | 30 million | Mammals/flowering plants become abundant |  |
| 20 | 5 million | Beginning of Cascade Volcanic Arc |  |
| 21 | 1.8 million | First primates |  |
| 22 | 40,000 | First homosapiens |  |
| 23 | 10,000 | End of last Ice Age |  |
| 24 | 8,000 | Founding of Jericho, the first known city |  |
| 25 | 500 | European rediscovery of the Americas |  |
| 26 | ~34 | Humans first explore the moon |  |

**Analysis**

1. Find where your birth date would be on the timescale. Why is it almost impossible to show a human’s life on this scale?

2. At which end of timescale has the most events? Why?

3. Is there an event that appears in the middle of the timescale? If so, what is the event?

4. Find the event where life first forms on Earth.

 a. What is this event?

 b. How many years ago did life first form on Earth?

 c. Is this in the first half of the Earth’s life or the second half?

 d. What does this information mean?