

TIME LINE SCRIPT

8. Begin with human history

Remind students that you used a scale of 1 cm for 1 million years. Have students gather around as you point out 1 cm on the time line. Unreel the time line as you add cards. This will keep students together and on task.

Tell them that this time line for Earth starts from modern times, so year 0 is today and is represented by this end of the rope. They will go backward in time on the Earth time line to find out how long ago thing happened on Earth. This is like the personal time line, where year 0 was the present and they moved backward in time. Ask,

- *Where would your lifetime show up on this scale?* [It can't be seen. It is right on the end of the rope. It wouldn't even be seen with a magnifier.]
- *Scientists have discovered remains of human beings as we know them, *Homo sapiens*, dating back 40,000 years. *Homo erectus*, or the first upright human, lived about 1.6 mya during a period we call the Stone Age. Where on the time line would we locate these events?* [0.04 cm or 0.4 mm and 1.6 cm from the 0 end.]

Ask students to look at their cards to find the two that are attached here. Students with these cards attach them to the appropriate paperclips.

9. Move to the ice ages

Tell students,

Before modern human beings existed on Earth, there was a period of time called the ice ages. Huge, thick ice sheets called glaciers covered large portions of the Earth. Animals such as woolly mammoths and huge camels roamed the land. Scientists think the ice ages began about 2 million years ago.

- *Where would we mark that on our Earth time line?* [2 cm from the 0 end.]
- *The fossil remains of a primitive human that scientists call Lucy have been discovered in Africa. She lived about 3.5 mya. Where would you locate her on the time line?* [3.5 cm from the 0 end.]

Have the students assigned to these events clip their cards to the appropriate paper clips.

10. Add more life to the time line

Continue with the narration,

*Paleontologists have discovered evidence for the first horses. The horses were very tiny and called *Hyracotherium*. The first appeared 60 million years ago.*

Have students attach this card to the time line.

TEACHING NOTE

Keeping students engaged during this activity can be a challenge due to the fact that you've relocated to a hallway or outside and are trying to convey a large amount of information. Keep the activity fast-paced and engaging by having students listening for their card to be called.

If students are restless, accelerate the script as needed. Don't cut any events, just proceed through them with less detail.

Once all the event cards are in place, students can walk the length of the time line in order to see any cards they missed hearing about.

The most important outcomes of this activity are:

- *Students get a sense of the vastness of Earth's history.*
- *Students can see that most events relatable to modern organisms are clustered near the 0 end.*
- *Students can see that human history is almost unnoticeable on this time scale.*

TIME LINE SCRIPT

11. Move to dinosaurs

Tell students,

One era that most people have heard about is the age of reptiles, or the time of the dinosaurs. Using fossil evidence and other evidence from rocks, scientists think the last dinosaurs lived until about 66 mya. This is when they became extinct.

- *Where would the last dinosaurs show up on our time line? [66 cm from the 0 end.]*
- *Paleontologists have discovered fossils that suggest the first birds came into being around 150 million years ago. The evidence suggests that birds may be related to dinosaurs. [150 cm from the 0 end.]*
- *The first true mammals also lived during the time of the dinosaurs. Paleontologists have found evidence that suggests that tiny, rodent-like mammals emerged around 220 million years ago. [220 cm from the 0 end.]*
- *Evidence also suggests that the first dinosaurs lived about 245 million years ago. Where would we show the beginning of the age of reptiles? [245 cm from the 0 end.]*

Geologists call the era from 245 mya to 66 mya, the Mesozoic era. Mesozoic is derived from the Greek language and means “middle life.” We live in the Cenozoic era, which is all of the time since the dinosaurs. Cenozoic means “recent life.”

Have students add the appropriate cards to the Earth time line.

12. Consider the great extinction

Tell students,

Just before the dinosaurs appeared, before the Mesozoic era, there was a great extinction. More than 90% of all species of marine life disappeared at that time. This extinction occurred at the end of what geologists call the Paleozoic era, the period of “ancient life.” The Paleozoic era lasted from 570 mya to 245 mya.

- *Where would we find the beginning of the Paleozoic era on our Earth time line? [570 cm from the 0 end.]*

Have students add the Age of Dinosaurs card and the Beginning of the Paleozoic card to the time line. They will need to measure back 5.7 m from the 0 mark to get to the beginning of the Paleozoic. (Note that there are still some empty paperclips between the beginning of the Paleozoic and the Age of Dinosaurs.) Have them notice that the first complex life marked the beginning of the Paleozoic Era.

TEACHING NOTE

Be sure to save about 10 minutes at the end of class to revisit the “Timeliner” multimedia and focus question, and to assign homework. If you’re getting close on time, consider having students affix the rest of the event cards at the appropriate locations and jump to Step 15, giving students a chance to read the cards in order before heading back to the classroom.

TIME LINE SCRIPT

13. Consider Paleozoic life

Tell students,

A number of organisms came into existence during the Paleozoic Era. All of the fossils you observed in the Grand Canyon rocks were found in Paleozoic rocks.

- *Paleontologists think that the first trees appeared on land around 385 million years ago. Earth's oldest known tree stood nearly 10 meters tall and looked like a modern palm tree. [3.85 meters from the 0 end.]*
- *Evidence suggests that the first insects began their lives on Earth around 400 million years ago. Cockroaches are some of the earliest insects. They were very similar to the cockroaches known today. [4.0 meters from the 0 end.]*
- *The first plants to grow on land probably existed 475 million years ago. [4.75 m from the 0 end.]*
- *The first fish began swimming around the oceans about 500 million years ago They were slow, bottom-dwelling animals covered from head to tail with a heavy armor of thick bony plates and scales. They were similar to lampreys and hagfish we find in oceans and the Great Lakes today. They had no jaws and had primitive fins. [5.00 meters from the 0 end.]*

14. Consider what's left

Tell students,

- *All of the time before the Paleozoic era is called the Precambrian era. It wasn't until the end of the Precambrian era around 600 mya that complex life on Earth actually came into being, according to scientists who interpret the fossil record in the rocks. A type of algae called a stromatolite has been found in Precambrian rocks dated at 2.7 billion years. [27 meters from the 0 end.]*
- *The oldest life identified from fossils so far is a form of bacteria. It has been given an age of 3.5 billion years. How far from the 0 end of our Earth time line should we locate this earliest known life? [35 m.]*

15. Continue to the beginning

Have students follow you as the rest of the time line is unrolled. Tell them,

- *Remember, scientists have determined that the age of Earth is about 4.5 billion years. Our time line is 45 m long, and 1 cm equals 1 million years. Look back along the time line to where we started, to where our lifetime is located. Where do we seem to know the most about Earth's history? [Closer to our lifetimes, recent times.]*

16. Roll up the time line

Have some helpers assist with removing the index-card event cards and rolling up the time line. Return to the classroom.