

## Create Your Own Geologic Timescale

Note to Parents and Guardians: The goal of this activity is to help your student understand the vastness of geologic time. The events toward the end of the timeline will get extremely crowded, so make sure your students know not to get discouraged if they can't fit it all. Just experiencing the timescale is enough! Make sure you maintain supervision of you student as they complete this activity.

### Needed Materials

- A length of yarn or string, 20ft in length
- Nails, or something to secure the yarn to the ground with
- Tape measure, at least 20ft

### Overview:

Based on radiometric dating, our planet Earth is approximately 4.6 billion years old. To put that in perspective, if we condensed down the existence of Earth to a single calendar year, our civilization would only exist for the last second of December 31. At home, you too can do an experiment to show just how long Earth has been around!

1. Lay out your string, preferably outside. Make sure you are in a safe area and have permission to be on the land, if it is not your own.
2. At one end of the string, put a nail, or something to hold the string down. This will be your starting point. This represents 4.6 billion years ago: The formation of the Earth. *Note: because we are using 20ft of string, 1 foot on this scale is equal to 230 million years*
3. Secure the other end of the string. This will be the furthest point on Earth's timeline so far-today.
4. Measure 6.75in from your starting point. Secure the string to the ground here. This represents approximately 4.47 billion years ago. This is when scientists believe our Moon formed.
5. Measure 4ft 9in from your starting point. Secure your string to the ground here. This represents 3.5 billion years ago. This is the age of some of the oldest fossilized bacteria we have record of. This bacteria lived in the primordial oceans of earth. We still see life like this today, which is called an extremophile. An extremophile is an organism that lives in an extreme environment, such as the frozen poles or the extremely hot deep sea vents.
6. Measure 17ft 3in from your starting point. Secure the string to the ground. This represents approximately 630 million years ago. Rocks from this time contain fossils that paleontologists believe are some of the first metazoans. Metazoans are animals that are made up of multiple cells of different types. This includes dinosaurs, birds, elephants, mammoths, and humans!
7. Measure 17ft 8in from your starting point. Secure the string to the ground here. This is equal to about 541 million years ago. This is where the "Cambrian Radiation" happens. This is where we first see most of the major groups of life we recognize today. At this time, all the animals would have lived in the oceans.

8. Measure 18ft 11in from your starting point. This represents approximately 252 million years ago. This is the boundary between the Permian and Triassic Periods. The Triassic Period marks the beginning of the Mesozoic, sometimes referred to as the Age of Reptiles. This era would see the rise and fall of the non-avian dinosaurs.
9. Measure 19ft 8.5in from your starting point, secure the string to the ground here. This is equal to 66 million years ago. This is when a meteorite struck near what is now Mexico. In the rock record, this is also where we stop finding non-avian dinosaurs. In geology and paleontology, this is called the K-PG extinction.
10. If possible, measure 19ft 11.99in from your starting point. This represents approximately 190,000 years ago. This is the same age as some of the oldest sediments in the sinkhole at the Mammoth Site of Hot Springs, South Dakota.
11. If possible, measure 19ft 11.995in from your starting point. This represents approximately 10,000 years ago, and the end of the last Ice Age. This is where we see most of the mega-fauna, like giant short-faced bears, giant ground sloths, woolly mammoths, and Columbian mammoths go extinct.
12. After you go through the following questions, make sure you clean up your timeline and return the materials to wherever you borrowed them from.

### **Additional Activities and Questions for Parents and Guardians to discuss with their children**

- Have your student pick their favorite animal, extinct or alive. Do some research with them to determine when that animal first shows up in the fossil record. Have them put it on the timeline. You can use the events already in place to estimate where it should go. It does not have to be exact
- Why do you think animals moved from living in the ocean to living on land?
  - Possible answers: Food sources on land- herbivores followed the plants, carnivores followed the herbivores, some animals might have used the ability to walk on land to avoid predators