Walk Around the Block … A Walk Through Time

Scale: 10 cm (26 inches) = 1.3 million years OR 1 meter (3.18 feet) = 13 million years

Point (how far from last point)		**Years back in time** (mya = millions of years ago)	**Significant Event**
1 0 meters (m)	PreCambrian Era	4,570 mya - Pre Cambrian	The beginning: the formation of the earth; no life yet. The planet cools and solidifies.
2 (47.7 m)		3,950 mya	Oldest known Earth rocks.
3 (65.4 m)		3,100 mya	First primitive bacteria. Date is unclear could be as old 3.5 billion.
4 (61.5 m)		2,300 mya	The first Big Freeze sometimes referred to as Snowball Earth.
5 (11.5 m) (at tree) no mark on sidewalk		2,150 mya	First photosynthesis detected by cyanobacteria or photosynthetic bacteria. Stromatolites begin to change the atmosphere.
6 (50.0 m)		1,500 mya	Significant amounts of oxygen (O_2) forms - creating the ozone layer.
7 (46.2 m)		900 mya	First multicellular life. By 570 mya sponges and colonial algae. Earliest fungi.
8 (28.0 m)	Paleozoic Era	535 mya Cambrian	Cambrian Explosion: Abundant soft-bodied animals; diverse shallow marine environment
9 (2.3 m)		505 mya	First fish; Trilobites, crinoids and brachiopods become common.
10 (5.2 m)		438 mya Ordovician	Earliest land plants; Lots of arthropods, centipedes, and early insects. Jawed fish. Euryptrids.
11 (2.2 m)		410 mya Silurian	First amphibians; Extensive radiation of fish and land plants.
12 (3.8 m)		360 mya Devonian	Formation of Pangaea begins. Fish-like amphibians (Tiktaalik) First seed plants. Large coal swamps giving rise to fossil fuels.
13 (3.8 m) (mid driveway)		310 mya Pennsylvanian	First reptiles emerge – first amniotes
14 (4.8 m)	Mesozoic Era	248-240 mya Triassic	Permian Extinction; the largest extinction event where 90% of all life is lost. Early dinosaurs appear and diversify; the origin of mammals occurs.
15 (1.2 m)		225 mya	The breakup of Pangaea begins.
16 (1.9 m)		200 mya Jurassic	Ancestors of modern day birds emerge; Dinosaurs and gymnosperms dominate the scene.
17 (4.6 m)		140 mya Cretaceous	Flowering plants appear; giant dinos and T Rex. Ants, bees, and butterflies, etc. become common.
18 (5.8 m)		65 mya KT Boundary	Extinction of the dinosaurs; "Age of the mammals" begins (although this is a misnomer).
19 (.85 m)	Cenozoic	54-40 mya Paleogene	Early mammals abundant. Rodents, primitive whales and grasses appear. Worldwide tropical rainforests emerge. Pigs, cats, rhinos, dogs and bears appear.
20 (3.0 m)		~ 100,000 years ago	First humans. First hominids occur about 4 mya.

Revised 2.20.25

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It is fun to make connections to the past. At the **end point (#20)**, we suggest you discuss the Cenozoic Era in more detail (see below). As you can tell from the numbers getting closer together, a lot happens in the last 65 million years! At the end of the Cretaceous, Earth gets struck by a giant asteroid off the coast of the Yucatan, and all the dinosaurs (except birds) become extinct. This catastrophe opens up new niches and the "Age of the Mammals" emerges. This title is misleading since mammals evolved much earlier, however, mammals did get really big. During the end of the cretaceous dinosaurs, pterosaurs, and marine were everywhere. Check out the largest pterosaur that ever lived over in the Redwood Capital Bank Building. Yes – there is one in Arcata! Its name is Quetzalcoatlus and it had a wingspan of 40 ft!

From **point #19** to the present, represents the passing of 40 million years of time or a mere 3 meters or 9.5 ft at this scale. This length of time is hard to grasp. We know a lot more about the last 40 million years than we do from earlier geologic eras because the fossil record is much more complete or unaltered from the forces of time. Recent fossils are typically better preserved and easier to find.

A CLOSER LOOK AT THE CENOZOIC

Generally, **eras** are broken down into geologic **periods** which are broken down further into **epochs**. The **Cenozoic** is divided into three periods which you can learn more about looking at our exhibits inside:

1) **Paleogene** (65 – 23 mya). Grasses emerge. First horses. This period is marked by a wide assortment of giant mammals and birds, including the ones we associate with today. Which ones can you list?

2) **Neogene** (23 – 2.6 mya). Co-evolution of insects and flowering plants emerge. Towards the end of this period the first hominids appear. Forests shrink and grasslands expand.

3) **Quaternary** (2.6 mya to present). Major glaciation events occur during this time. Extinction of large mammals and large flightless birds occur. Humans migrate out of Africa. The first upright walking human-like (hominin) apes are discovered about 4.5 mya (in the Neogene). About 40,00 years ago modern humans (Cro-Magnon) first appear. Much more information about early hominins can be found inside the museum.

The first **epoch** within this relatively modern-day period is the **Pleistocene** which is associated with large ice age mammals, such as mammoths and saber tooth tigers. Can you think of other large animals associated with glaciers, tundra, and ice? (*answers: polar bears, musk ox, caribou, reindeer, cave bears, etc*.) Be sure to check out the mural on our portable classroom in the back to see some ice age animals to scale.

The most recent **epoch** is called the **Holocene** which is the one we live in today. This epoch gives rise to human civilization and agriculture when humans begin to compete for resources. Today we are altering our planet rapidly creating the **Anthropocene**. One of the greatest challenges facing us today is our ability to coexist with other plants and animals as we increasingly reduce their habitat and pollute the environment.

Review: How much distance represents 1.3 million years of history on our scale? (*answer 10 cm)*

SCALE ----------10 cm---------- (3.94 inches) = 1,300,000 years

Please return this sheet to the front desk. Thank You!

Revised 2.20.25