 **Around the Block … A Walk Through Time**

Scale: 10 centimeters (3.94 in. ) = 1.3 million years OR 1 meter (3.18 ft.) = 13 million years

This walk through Earth’s history begins at point 1, located at the front entrance of The Museum. To go in order from oldest to youngest as listed, you will want to walk towards G St. and then make a left turn (head south) on G. St.

 **Please read each event below at every corresponding point (our marks are maroon and beige).**

|  |  |  |  |
| --- | --- | --- | --- |
| **Point** (how far from last point) | ERA | **Years back in time**(mya = millions of years ago) | **Significant Event** |
| **1** 0 meters  | **---------- PreCambrian ---------**  | 4,570 mya  | 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 (anaerobic archaebacteria). 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) | 2,150 mya | First photosynthesis by bacteria (cyanobacteria). Stromatolites exist. Around 2.5 billion first algae occur. |
| **6** (50.0 m) | 1,500 mya | Significant amounts of oxygen (O2) forms creating the ozone layer. The oxygen was produced by photosynthesis. |
| **7** (46.2 m) |  900 mya | First multicellular life. By 570 mya sponges and colonial algae. |
| **8** (28.0 m) |  **---------Paleozoic** ---------- |  535 mya | Cambrian Explosion: Abundant soft-bodied animals; diverse marine environments abound . |
| **9** (2.3 m) |  505 mya | First fish; Trilobites, crinoids, and cephalopods become common. |
| **10** (5.2 m) |  438 mya | Earliest land plants; First spiders, scorpions, centipedes, and early insects. Jawed fish emerge. |
| **11**  (2.2 m)  |  410 mya | First amphibians; Extensive spread of fish and land plants. |
| **12** (3.8 m) |  360 mya | Formation of Pangaea, the last super continent; First “coal swamps” eventually giving rise to fossil fuels. |
| **13** (3.8 m) |  310 mya | First reptiles emerge. Amniotic egg has developed. |
| **\*14** (4.8 m) |  **--------Mesozoic ---------** | 248-240 mya | Permian Extinction: the largest extinction event where 90% of all life on Earth is lost. True dinosaurs appear and diversify; the origin of mammals occurs. *\* Modified scale* |
| **15** (1.2 m) |  225 mya | The breakup of Pangaea begins. |
| **16** (1.9 m) |  200 mya  | Ancestors of modern day birds emerge; Dinosaurs and gymnosperms dominate the scene.  |
| **17**  (4.6 m) |  140 mya  | Flowering plants appear; marsupials, ants, bees, and butterflies, etc. become common.  |
| **18**  (5.8 m) |  65 mya | Extinction of the dinosaurs; “Age of the mammals” begins (although this is a misnomer).  |
| **19** (.85 m) | **---Cenozoic---** |  54-40 mya | 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 (upright walking apes) occur about 4 mya. |

 **Around the Block … A Walk Through Time (pg 2)**

Towards the end of your walk, you will find an explosion of biological events in the last era of geologic time. At the **end point (#20)**, we suggest you discuss components of this geologic era called the Cenozoic, in more detail (see periods below) with your group. The **Cenozoic Era** spans from 65 mya when the dinosaurs become extinct until today. Sometimes this period of time is called the “Age of the Mammals” which is a bit misleading since mammals evolved much earlier. It is fun to make connections to the past. Our species owes our existence to an impact from space, which was the main cause for the extinction of the dinosaurs! Once a species is extinct, it is gone forever for all practical purposes. Extinction has happened repeatedly over the course of geologic time, which is one of the amazing things paleontology teaches us.

From **point #19** (40 mya) to the present (which ends near the cement sign) a span of 40 million years of time has passed. This length of time is hard to grasp. At this scale it is represented in a mere 3 meters or 9.5 feet. We know a lot more about the last 40 million years than we do from earlier geologic eras. The landscape is more recent and therefore has not been as altered from the forces of time, such as plate tectonics or volcanic eruptions. Fossils and other artifacts are more recent and are therefore typically better preserved and easier to find. In addition, ice cores give us a record of repeated climate change found by drilling down into glaciers where air is trapped and the *puzzle of time* is a little easier to put together.

**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). This period is marked by a wide assortment of 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 **Quaternary period** began around 2.6 million years ago (mya). The first upright walking human-like (hominid) apes are discovered about 4.5 mya (in the Neogene). About 150,000 years ago modern humans (CroMagnon) first appear. Much more information about this is found in our hominid exhibit inside.

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*.)

The most recent **epoch** is called the **Holocene** and 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 in order to preserve them and the natural places they need to survive.

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**