Earth's Time Periods

Hadean Time (4,500 to 3,800 million years ago)

Humans have always wondered how the earth was formed. Many myths and legends attempt to tell the story of its creation. Scientists believe in the beginning of Earth's history it was dark and cold, and then great collisions occurred. Elements that would become our sun came together and created light and heat, gas and dust. Collisions away from the sun became baby planets. As the gas cooled it became hot liquid.

At a perfect distance from the sun, our planet Earth formed a crust around a hot liquid center. Cracks in the crust allowed the hot liquid to spurt out, forming the oldest rocks on our planet. They made the first layer of the crust. These rocks tell us that our earth is billions of years old. There are not many places where these rocks exist today, because most of them melted back into the liquid center.

Ancient volcanoes filled the atmosphere around the new planet with cloud-forming dust. Rain from the clouds fell and created the oceans. There was no life on the earth during the Hadean time. It was a time of preparation. The Hadean time lasted 700,000,000 years.

Archaean Time (3,800 to 2,500 million years ago)

At the end of the Hadean time, the earth was covered with thick, soupy seas. The atmosphere was made of hydrogen, ammonia and methane, not oxygen. It wasn't a place you or I could survive yet. But the first cells of living things began existing in the oceans. They are called cyanobacteria and they are able to make oxygen from the sun's energy.

Most of the rocks that formed our continents were being built during this time period. Most of them don't exist anymore, because they were changed by immense pressure or returned to the molten core of the earth. Those rocks that still survive, telling about this time, are found in Western Australia, Canada, India, and South Africa. The forming of these continents probably began as lava flows under the ocean. The Archaean time lasted for 1,300,000,000 years.

Proterozoic Era (2,500 to 543 million years ago)

Many important changes to the earth happened during the Proterozoic Era. The atmosphere was filling with oxygen, thanks to the work of cyanobacteria during the Archaean period. The earth was cooling. But the oceans were too salty for much life to survive. During this era, a new type of cell appeared that could eat the poisonous salts. The new animal used the salts to build shells for their bodies. These animals are called foriminiferans, and more than a third of the ocean bottom is made up of their remains. Rocks on the ocean floor contain fossils of their shells, preserving this important part of history. The Proterozoic era lasted for 1,957,000,000 years.

Paleozoic Era (543 to 248 million years ago)

After the forimiferans made the oceans less salty, there was an explosion of life on earth! Because of so much change, the Paleozoic Era is split into six different periods. The first of these is called the Cambrian Period, or the Cambrian Explosion, since it introduced so many new life forms. Arthropods, mollusks, and echinoderms existed during this period. The most famous animal of the Cambrian Period was the trilobite. Plants during the Cambrian period were simple, one-celled algae.

New species of animals developed all through the Paleozoic Era. Fish developed during the middle part of the era. Cephalopods were mollusks that had feet growing out of their heads. By the end of the Paleozoic Era, lichens, a partnership between fungi and algae lived out of the water, breaking down rocks and making soil.

Something catastrophic happened at the end of the Paleozoic Era, causing mass extinction. As much as 95% of life on Earth died. The Paleozoic Era lasted 295,000,000 years.

Mesozoic Era (238 to 65 million years ago)

It took most of the Mesozoic Era for life on Earth to recover from the extinction that occurred at the end of the Paleozoic Era. The earth now looked very different. The seas were lower, and places on Earth had tropical forests, marshlands and deserts. Life began existing on dry land. Plants developed stems and seeds. Animals developed tough outer skin to hold in moisture and cold-blooded circulation systems to adapt to extreme temperatures. Reptiles became giant species, living on land, in the seas, and in the air. Mammals existed, but they were small and not very influential during the Mesozoic Era.

During the Mesozoic Era, continents did not look like they do now. Originally all the continents were hooked together into one giant land mass, called Pangea. It was shaped like the letter “C” and it straddled the equator, so all the land was warm. The interior of the supercontinent was dry and desertlike. But Pangea began breaking up almost as soon as it was formed. The part of Pangea north of the equator was called Laurasia. It was formed by what is now North America and Eurasia. The part of Pangea south of the equator was called Gondwana. It was made up of South America, Africa, India, Australia, and Antarctica. Mountains were beginning to be pushed up through the crust, and continents were beginning to break apart. By the end of the Mesozoic Era, South America and Africa had broken apart.

Another catastrophic event caused mass extinction at the end of the Mesozoic Era. Many scientists think the earth was hit by a giant meteor or a huge volcano erupted. The time of the giant reptiles was over. The Mesozoic Era lasted 173,000,000 years.

Cenezoic Era (65 million years ago to present)

The Cenezoic Era began 65 million years ago. It is the time in which we now live, although human existence represents only a tiny sliver of Earth’s timeline. Its most important life form is the mammal. Other life forms appearing during the Cenezoic Era are flowering plants, insects, fish with bones, and modern birds. During the Cenezoic Era, land masses moved into new locations on the globe. Great ice ages caused the seas to recede. We are still in the Cenezoic Era.

There are two main classifications within the Cenezoic Era. The earlier classification of the Cenezoic Era is the Paleogene Period, lasting from 65 to 24 million years ago. At the beginning of this period, the earth was mostly tropical or semi-tropical. Palm trees grew as far north as Greenland! But the earth continued to cool. At this time, Europe was connected to North America, Australia was connected to Antarctica, and India was a continent all by itself. The Atlantic Ocean was forming. Gradually, Europe and North America separated, Australia and Antarctica separated, and Antarctica became covered with ice.

The most recent classification of the Cenezoic Era is called the Neogene Period, lasting from 24 million years ago and continuing to the present time. During this time, the earth became cooler and drier. Grasslands replaced forests in many places. Continents crashed into each other, pushing up mountains in many places. India continued its push in to Asia, creating the Himalayan Mountain Range. Italy moved north into Europe, raising the Alps. Spain crashed into France to form the Pyrenees

Mountains. Africa closed off the Mediterranean Sea. The Rocky Mountains in North America and the Andes Mountains in South America all formed during this time period.

Colliding continents caused lower sea levels, and the North and South Poles began to have ice caps. New mountains trapped ice and snow, causing the sea level to become even lower. Land bridges opened between continents and animals began migrating between continents. South America moved to the north, merging with North America and forming the Isthmus of Panama. Armadillos, porcupines, ground sloths, and opossums migrated from South America to North America. Dogs, cats, bears, and horses from North America migrated to South America.

The earth continued to cool during the Neogene Period. Eventually it was locked in an ice age. The lower sea levels, new mountains, and changing ocean currents all contributed. Glaciers reached down as far as Ohio in the United States from the polar ice caps. Great mammals adapted to live in these colder times, including the wooly mammoth, mastodon, wooly rhinoceros, and the reindeer. Other great carnivorous mammals were the saber tooth tiger, cave bear, and dire wolf. The climate did not stay cool through the entire Neogene Period. Scientists have calculated many periods of warming and cooling throughout this time.

The greatest mammal to appear during the Neogene Period is the human. Yet, if the entire history of the earth were place on a clock, and every hour represented 375,000,000 years, the history of humans on Earth would represent only 7 seconds.