History of Life Tour

**Aquatic Vertebrates and Amphibians**

*Information on Boards along the Walls near the Dinosaurs*

On the walls to the sides of the door into the main gallery, we see the evolution of life on Earth. To the right of the doors to the main gallery, we see the evolution of all life (now only mammals); to the left of the doors to the main gallery, we see the evolution of vertebrates in particular (not true anymore; now *History of the Earth*). The universe is between 12 and 18 billion years old, however the earth was formed only 4.6 billion years ago with the oldest known life dating back to 3.5 billion years ago. In the diagrams on the wall, the coloured lines each represent one group of organisms; the blue ribbons running between the groups illustrate the evolutionary connections between the groups. The width of the coloured lines represents the number of species known to exist in each of the groups, at each particular time throughout history; the thicker the line, the more species in the group. (Any of the groups can be used to explain how the diagram works – the reptiles are a good choice.)

The specifics of the major events that occurred throughout the history of life are included below. However, in a tour, reeling off dates is not the most effective way to present this material. For children especially, it is probably easiest to stick to discussing the major extinction at the end of the Cretaceous.

Once you have explained how the diagram works (with the thickness of the lines and so on), you can ask questions to the group to discuss the major events in the evolution of vertebrates that are shown on the vertebrate wall. Such as: when did the dinosaurs go extinct or what other groups of animals went extinct along with the dinosaurs or whether can they see a point on the wall when there was a major extinction in the vertebrates. Which groups did not become extinct at that time? Which groups diversified greatly after the extinction?

The Cretaceous extinction occurred 65 million years ago and included the extinction of the dinosaurs, the rulers of the land, the pterosaurs, the rulers of the air, and the large marine reptiles, the rulers of the sea. This extinction opened up a lot of room (biological niches) to be filled by the groups of organisms that did not go extinct at that time, the mammals, the birds and the fish. It is believed that the Cretaceous extinction was caused by the impact of a large asteroid with the Earth. The Yucatan basin (in the Bay of Mexico) was formed by the impact of an asteroid at approximately the end of the Cretaceous.

This asteroid was large enough that upon impact with the earth it could have kicked up enough dust to cover the surface of the entire earth. It is thought that his dust would have blocked out the sunlight and killed out the plants, then the herbivores, and finally the carnivores. Geological evidence lends credit to this theory: a layer of a chemical element called iridium is found in rocks from the Cretaceous, around the entire earth. Iridium is not commonly present on Earth, but is present in abundance in rocks from outer space. So it is believed that the Iridium layer from the Cretaceous period was due to the impact of the meteorite.

***Dates and Information***

4600 mya Our planet was born

3500 mya LIFE in the form of tiny simple bacteria

2000 mya Formation of the first complex cells

1000 mya Appearance of plants in the form of multi-cellular algae

565 mya The first animal-like creatures appear

and by 544 mya Animals are an important and evident part of the oceans…  
From this point on, the mural has an expanded Phanerozoic section to better illustrate the evolution of life (excluding the vertebrates) as it makes its way up to the present.  
245 mya Major extinction  
230 mya Appearance of dinosaurs  
65 mya Extinction of dinosaurs, marine reptiles and pterosaurs  
a mere 600,000 ya Modern anatomical humans! (not illustrated on this board)