

WELCOME TO THE MUSEUM OF NATURAL SCIENCES

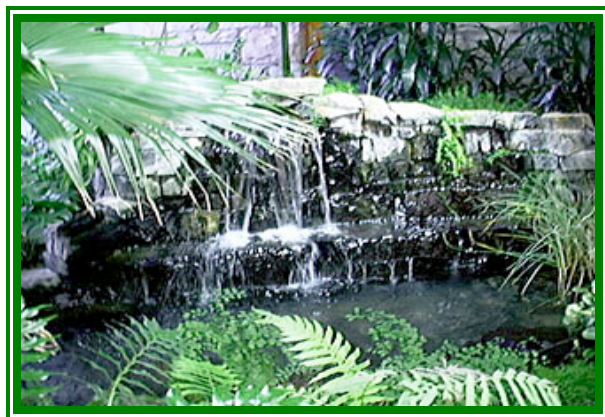
The Museum of Natural Sciences was made possible by the combined efforts of the Biology and Geological Sciences Departments of the University of Saskatchewan. This museum is designed to outline evolution throughout geological time, providing an integrated learning environment, with displays of living plants, animals, and fossils. There are display panels with each exhibit to explain the history of these plants and animals in greater detail.

IMPORTANT

Out of respect for the animals, plants and other exhibits in this museum, PLEASE:

- ◆ Do NOT stand on the base of displays
- ◆ Do NOT tap on the animal displays
- ◆ Do NOT touch plants and Do NOT play in the water

Enjoy your time at the Museum of Natural Sciences as it takes you through the history of life on Earth.



Waterfall Pond – Home of the Koi fish

Age of Fish

The Devonian Period (410 to 360 mya*) is known as the Age of Fishes because it was a time of great diversification of fish and the evolution of all major groups of jawed fishes.

In the various tanks and ponds present, it is possible to see representatives of some of the Earth's diverse aquatic life. For instance, in the INVERTEBRATE tank there are sea anemones, starfish, hermit crabs, and barnacles. When looking at this tank, stay for awhile, as it is amazing what may appear unexpectedly!

In the SASKATCHEWAN tank one can find fish native to Saskatchewan, such as lake sturgeon or the fathead minnow.

In the TROPICAL fish tank there are fish native to warm salt water systems, such as the Red Sea or Southern Pacific Ocean. Notice how these fish display an aggressive behavior toward other fish that enter their territory.

In the AMAZON tank there are angelfish, a type of warm freshwater fish. Angelfish are known for their aggressive, predatory and destructive behavior, as well as for their parenting skills. They are a type of cichlid.

The fish in the AIR-BREATHING tank represent an important step in evolution. The fish in this tank have an alternate way of getting oxygen than a normal fish will normal gills. Some can live out of water for extended periods of time, but need water at some point to survive. This is an important evolutionary step, as these fish could travel from pond to pond, spreading their population over long distances.

*mya – million years ago

Age of Amphibians

The Age of Amphibians spans about 100 million years following the first appearance of vertebrates on land about 370 mya. Towards the end of this Age, an increasing number of reptiles shared the land.

The bullfrogs in the amphibian display are native to much of North America including British Columbia, Ontario, and most of the United States. It is possible to tell the difference between the males and females by their ears. If the ear, which is the circular shape located behind their eye, is larger than the eye, then it is a male. If the ear is the same size or smaller than the eye it is a female. In addition, male frogs will have larger thumbs than the females, as the thumbs are an important part of the mating ritual.

Located near the bullfrogs is a fiberglass replica of *Eryops*, an amphibian that lived before the dinosaurs, some 270 mya.



Age of Reptiles

The Age of Reptiles includes the Triassic, Jurassic, and Cretaceous periods (250 to 65 mya). Reptiles dominated the land and took to the sea and air. Dinosaurs are the most famous of the reptiles.

Triceratops was a large herbivorous dinosaur, which attained a length of 9 m and weighed 8 tons. The elaborate frill on the neck served as a defense mechanism against attack and allowed space for certain muscle attachments in order to increase the power of head movements.

Tyrannosaurus rex is probably the dinosaur about which most people know. This was one of the largest carnivores to ever live, achieving a height of 6 m and a length of 15 m. The long tail was used for balance. In general, it has always been said that *Tyrannosaurus rex* was a predator, hunting for its food. However, some have thought that the large size and massive bulk limited its agility, and as a result *Tyrannosaurus rex* should be considered a scavenger. Which theory do you think is correct?

Also found in the museum is *Stegosaurus*. This 6 m long dinosaur had large plates on its back that were not attached to the skeleton of the reptile at all. It is thought that these plates may have had two functions: to provide protection and for use in thermoregulation.

A live modern reptile located in the museum is the non-venomous black rat snake, native to North America. It is a reptile that relies on stealth and surprise to obtain food and camouflage to protect itself from predators. It is sometimes difficult to locate, often hiding in logs or under plants or rock.

Age of Mammals

The Age of Mammals follows the extinction of the dinosaurs at the end of the Age of Reptiles, 65 mya. We live in the Age of Mammals. Mammals today are the principal land-dwelling vertebrates, although some have taken to the air or returned to the sea.

A major display in the museum features the **EVOLUTION OF THE HORSE**. There are five skeletons of horses in the museum, representing how the horse has changed over time. The earliest known member of this group is *Hyracotherium*, a forest-dwelling animal with three and four toes that lived over 55 mya. During the Tertiary Period the characteristics of the modern horses developed. These included the reduction in the number of toes (from 4 to 1) with the development of the hoof, an increase in size, and the development of high-crowned, deeply-ridged teeth. The earliest horses did not possess high-crowned teeth. Instead, they had low, simply-ridged teeth as found in browsing animals who would select only soft foods for consumption. With the development of high-crowned teeth, the horse was able to inhabit different regions, such as the grasslands. High-crowned teeth are adapted for grazing sharp, gritty grass, wearing well and retaining a good grinding surface for a long period of time. As you look at these five horse skeletons, see if you can identify these features.

Representing mammals, you will also find a display of live degus (pronounced *daygoos*). Mammals are warm-blooded, give birth to live young, and produce milk with mammary glands, and most have hair or fur. Mammals are warm-blooded and are able to exploit environmental niches that could not support cold-blooded reptiles or amphibians.

Age of Plants

Although the focus so far has been on the evolution of animals, these animals were dependent on the evolution of plants. The first plants appeared on land well before the earliest amphibians, more than 400 mya. All living land plants, including mosses and liverworts, evolved from green algae.

Early land plants were very small, probably confined to low wet habitats. During the Age of Fishes, plants underwent great diversification and the first land plants appeared. At the end of the Devonian period the first great forest ecosystems evolved, and into these ancient forests crawled the first amphibians.

During the Age of Amphibians, coal forests of giant club mosses and horsetails covered much of the land. Ferns and fern-like plants were abundant. This period, the Carboniferous, is also known as the Coal Age. Near *Eryops* are ferns, wisk ferns and horsetails, collectively representing the vegetation of the Coal Age.

Near the window wall are many archaic seed plants, such as the conifer *Araucaria*, representing the vegetation of the Age of Reptiles, also known as the Age of Conifers and Cycads. With large palm-like leaves, Cycads were abundant and diverse at that time, but now are nearly extinct. Conifers remain a significant part of world vegetation even today, and are the basis for Canada's forest industry. Both conifers and cycads are seed plants, unlike the spore-producing ferns, club mosses and horsetails, and are able to exploit virtually all land habitats.

Angiosperms, the flowering plants, are the most recently evolved group of plants. They appeared during the Age of Reptiles, and now dominate most land environments. The tremendous diversity of angiosperms is scarcely represented at the waterfall and horse displays. Angiosperms provide a significant amount of

food energy for nearly all land vertebrates, including humans.

OTHER DISPLAYS

- ◆ **EARTH SCIENCES:** The displays along the ground floor hallway of the Geology Building illustrate minerals, rocks, and meteorites. Seismic recorders, which detect earthquakes from around the world, can be seen in the interior hallway.
- ◆ **FOSSIL RECORD:** The displays on the second floor of the Geology Building include more fossils and information on the history of the Earth and life.



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For group bookings call: 966-4399

<http://www.usask.ca/geology/museum.html>

For Campus Tours, contact the Diefenbaker Canada Centre at 966-8384