

FOSSIL PLANET

Teacher Resource Guide

Program Overview

PROGRAM DESCRIPTION: Welcome to your crash course on palaeontology!

Explore the process of fossilization and the differences between types of fossils. Glimpse behind the scenes to follow the journey of a fossil from its discovery, excavation in the field, and preparation at the Museum.

The program concludes with an interactive Q&A period where we use images, videos, and real fossils to complement our answers.

AUDIENCE: Grades K - 12, General Public *(maximum 35 students)

Curriculum Connections

Kindergarten Science: Movements of Animals; Examine and Describe Environments.

Grade 1 Science: Understanding Movement; Environmental Change; Needs of Animals and Plants, Scientific Investigation.

Grade 2 Science: Earth and Landforms; Growth of Animals and Plants; Investigation Methods.

Grade 3 Science: Earth and Landscape Changes; Plant and Animal Interactions; Investigation for Understanding.

Grade 4 Science: Organism Classification and Functions; Evidence and Data.

Grade 5 Science: Climate and Weather; Evidence, Understanding, and Ethics.

Grade 6 Science: Climate Change; Ecosystems; Scientific Explanations.

Grade 7 Science: Interactions and Ecosystems, Planet Earth.

Grade 8 Science: Freshwater and Saltwater Systems.

Grade 9 Science: Biological Diversity.

Grade 10 Science 10: Energy Flow in Global Systems.

Grade 11 Science 20: The Changing Earth, Changes in Living Systems.
Biology 20: Ecosystems and Population Change.

Grade 12 Science 30: Living Systems Respond to Their Environment.
Biology 30: Changes in Populations and Communities.

Program Objectives

Students will be able to:

1. Learn about Alberta's amazing fossil record.
2. Discover a variety of fossil types, and learn the difference between body and trace fossils.
3. Understand the journey of a fossil from its excavation to its display in the Museum.
4. See how palaeontologists use fossils as data for the scientific process.

Pre-program:

1. Have the participants seated in rows with as many students as possible in view of the camera. Refer to the "Pre-Program Question Activities" for inspiration.

Program Format

1. Introduction to palaeontology.
2. The process of fossilization (articulated vs. disarticulated fossils).
3. Examples of body fossils (permineralization, petrification, carbonization, amber).
4. Fossil excavation and the preparation process.
5. Examples of trace fossils (trackways, pathology, coprolite).
6. Palaeontologists and the scientific process.
7. Game: Body or trace?
8. Fossil storage and collections.
9. Interactive question period.

Key Terms

Amber: The fossilized resin of trees that has hardened through polymerization into a plastic-like consistency. These gemstones often contain the remains of organisms that had become trapped in the sap such as insects, plants, and even feathers.

Carbonization: When organisms are buried in low oxygen environments and the residual carbon of that organism is left in the rock, often in two-dimensional form.

Casts/Molds: The impressions an organism left behind (mold); sometimes these are subsequently filled in by sediments that harden, creating a replica of the original (cast).

Coprolite: The fossilized dung or feces of an animal.

Field Jacket: A coating of plaster and burlap wrapped over a fossil that is used to protect it.

Fossil: The remains, traces, or imprints of a prehistoric organism preserved in rock.

Fossilization: The process that preserves the remnants, impressions, or traces of an organism in rock over time.

Palaeoenvironment: The environment of the past.

Palaeontology: the study of ancient life on Earth based on the fossil record.

Palaeontologist: A scientist who studies palaeontology.

Permineralization: When minerals fill the spaces within organic tissues and create a natural internal cast of the organism.

Petrification: Both permineralization and replacement are commonly referred to as petrification, which means “turned to stone.”

Trackway: A series of footprints or tracks in a row belonging to the same individual.

Pre-Program Question Activities

The end of the program supports inquiry-based learning and we provide an opportunity for students to ask questions. These questions can be spontaneous, but we find that discussing questions or topics before the program can help students be more engaged. There is no need to email a question list ahead of time.

If students have trouble generating questions, or if specific curriculum connections need to be made, the following prompts can be used:

Species Specific: Have each student choose a dinosaur they would like to know more about. Each student should try to write down as many facts as they can (size, diet, habitat) to find gaps in their knowledge they want to learn more about.

Fact vs. Fiction: The media doesn't always show an accurate depiction of prehistoric life and palaeontology. What dinosaur behaviour have they seen in media would they like to know more about? Are there any creative examples of palaeoart they may want to discuss?

General Questions: Discuss with the students ahead of time what the program is about. Give them time to come up with one to three questions they would like answered. Feel free to have the students share their questions with the class, which might inspire other students.

Post-Program Activities

We recommend that teachers have a discussion period with their students about the program. This will allow the instructor to cement key concepts, curriculum connections, and themes while the program is still fresh in their minds. Group discussion can also help the students develop new questions and formulate conclusions. Students can write down three facts they learned through the program, or a short list of their favourite specimens. They then can share what they learned with the rest of the class. Encourage students to develop new questions they would like to explore to build upon their new knowledge base.