

# SECRETS OF THE LOST QUARRY

Teacher Resource Guide

## Program Overview

**PROGRAM DESCRIPTION:** Investigative skills are put to the test in this interactive adventure! Journey into the Alberta badlands to rediscover a fossil site lost over 100 years ago. Students are transported through the Red Deer River valley to collect and study evidence pointing to the location of a historic dinosaur quarry.

**AUDIENCE:** Grades 2 - 6 \*(maximum 35 students)

## Curriculum Connections

**Grade 2 Science:** Earth and Landforms; Growth of Animals and Planets; Investigation Methods

**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

## Program Objectives

**Students will be able to:**

1. Use deductive skills to gather evidence to find a lost dinosaur quarry in the Alberta badlands.
2. Review the basic rock types, focusing on sedimentary rocks, and what they can tell us about the ancient Alberta environment.
3. Explore the history of early fossil hunting in Alberta.

**Pre-program:**

1. Have the participants sit in rows and in view of the camera

## Program Format

1. Introduction:
  - What are lost quarries?
2. Journey through the Red Deer River valley:
  - Formation of the badlands.
  - Geology review.
3. Palaeontological history of the area.
4. Search for the lost quarry:
  - Prospecting for evidence.
5. Journey back to the Museum.
6. Questions and conclusion.

## Core Content

### HISTORY OF PALAEOLOGY

In 1884, Joseph Burr Tyrrell (pronounced TEER-uhl), the Museum's namesake, came to the Alberta badlands as a geologist with the Geological Survey of Canada.

- While prospecting for coal seams in the Red Deer River valley, he accidentally discovered the skull of a theropod dinosaur.
  - Theropod** – means “beast foot”, referring to the three-toed, meat-eating dinosaurs
- The dinosaur he found was later named *Albertosaurus* in 1905 in honour of Alberta.
- As word of dinosaur discoveries spread, fossil hunters traveled to the Alberta badlands during the Great Canadian Dinosaur Rush (1910 - 1917) looking for fossils.
- Fossil hunters traveled along the Red Deer River in rafts called scows.
  - Scow** – a flat-bottomed raft, capable of traversing very shallow waters

## SEARCH FOR THE LOST QUARRY

The clues have led to Horsethief Canyon, a canyon once used by horse thieves who hid and re-branded stolen horses among the hills.

Prospecting is how palaeontologists find fossil evidence. This process involves searching the ground for small pieces of fossils. To find a lost quarry, evidence of people working must be found. This includes old newspaper bits, remains of field jackets, tin cans, buttons, etc.

## IMPORTANCE OF FINDING LOST QUARRIES

Many early fossil hunters did not collect all the fossils at a quarry. For example, if they were in a rush they might have collected only the skull, leaving the rest of the body behind. If the lost quarry can be found, there may be more fossils to find and collect.

- By finding a lost quarry new information can be found.
- By examining the rock in which the fossils were originally buried, we can tell the approximate age of the fossil.
- The type of rock can tell what the environment was like.
- How the creature might have died.
- If there were any other fossils not collected or associated with the original find.

## Key Terms

**Cretaceous Period:** The third and latest period of the Mesozoic Era, from 145 – 66 million years ago.

**Deposition:** The accumulation of sediments.

**Erosion:** The group of processes that loosen or dissolve rock material and transport it, mainly by water, ice, wind, and gravity.

**Field Jacket:** A covering of burlap and plaster that protects a fossil during transport.

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

**Fossil Matrix:** Concentrated fossil and rock material that has been processed by screen washing.

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

**Geology:** The scientific study of the origin, history, and structure of the Earth.

**Glaciation:** The scouring and wearing down of the Earth through erosion and deposition by glaciers.

**Hoodoo:** A mushroom-shaped rock formation that is caused by differential resistance to erosion.

**Palaeoenvironment:** The environment of the past.

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

**Quarry:** A place of excavation/digging where, in this case, fossils are recovered.

**Strata:** Layers of sedimentary rock or soil, or igneous rock formed at the Earth's surface.

**Stratification:** Formation of strata.

**Weathering:** The group of processes, both chemical (e.g., air, rainwater, plants, bacteria) and mechanical (e.g., changes of temperature), that change the character of a rock, but does not move it.