CAVE OF THE MOUNDS®
National Natural Landmark

Educational Programs

PaleoTALES

Fossil Mini-Course

Grade 9-12

Wisconsin DPI Standards:

Science:
A.12.3, D.12.4, D.12.5, D.12.6, D.12.11, D.12.12, E.12.2

Objectives:

At the end of this program, the student should be able to:

- Apply fossil related vocabulary.
- Name & identify the four fossil types.
- Describe the processes involved in fossil formation.
- Explain the importance of fossils in understand how the earth has changed through time.
- Examine and identify 6-8 fossils and determine the type of each.

Activities:

Times are approximate and specific reinforcement activities will vary based on the needs of each individual group.

30 minutes	The interactive audio visual presentation provides the definition of a fossil, investigation of the four fossil types, fossil formation and processes of collecting and identifying fossils.
30 minutes	Sluicing gives participants a hands-on experience to discover their own collection like a true paleontologist. Guided identification shows examples of both local and non-local fossils.
50 minutes	The Cave Tour fosters a connection between previously discussed fossil and geology concepts with the experience of observing embedded within the rock of the Cave.

Pre-teach Vocabulary:

A glossary of terms is provided for your convenience.

Geology	Fossil	Cephalopod	Brachiopod
Geologic Time Scale	- Mold	Gastropod	Echinoid
Geologic Processes	- Cast	Pelecypod	Goniatite
Sedimentary rock	- Trace	Horn Coral	Petrified Wood
Law of Superposition	- Body	Crinoid	Dinosaur Bone
Limestone	Paleontology	Trilobite	Shark Teeth

Learning Extension:

Try this before or after your visit to reinforce important concepts.

1. Closely examine fossils, identify and determine the age of your fossils with a fossil identification book.

You will need:
Various fossils to examine
(use collection from PaleoTALES program when possible)
Fossil identification book
Glossary of Terms
Geologic time scale
Paper and pencil

2. Choose several fossils to focus on that would have lived during the same time periods, for example, the Horn Coral, Echinoid, and Cephalopod all lived during the Ordovician period.
3. Use the geologic time scale to place fossils in appropriate time periods. The time scale can be used to better understand Earths atmosphere and environmental conditions during different periods of geologic time.
4. Investigate the biological adaptations your chosen plants or animals had developed in order to survive in their ecosystem.
5. Investigate how these organisms would have cooperated or competed in their ecosystem.

Glossary of Terms

Geology - Scientific study of the earth and earth materials.

Geologic Time Scale – A scale created by scientists to divide periods of time by significant events in the history of the Earth. (Suggested Resource: http://www.ucmp.berkeley.edu/help/timeform.html)

Sedimentary rock – a type of rock that is made of very small pieces of other rocks, or tiny pieces of shells from sea creatures. Sedimentary rock often forms underwater, where these tiny pieces of rock or shell become tightly stuck together (cementation) forming layers of new rock.

Law of Superposition - Sedimentary layers are deposited in a time sequence, with the oldest on the bottom and the youngest on the top.

Limestone – a type of sedimentary rock that formed on the bottom of the ocean floor long ago. It is made of tiny pieces of shells from sea creatures, and often contains fossils.

Fossil – the evidence or remains of ancient life preserved in rock.

- **Mold** – an impression or indentation of ancient life.
- **Cast** – a mold fossil that has been filled with material, creating a replica of ancient life.
- **Body** - The actual remains of ancient life; includes bones, shells, and teeth.
- **Trace** - Any indication of prehistoric life, such as tracks, trails, burrows, or nests

Paleontology - Scientific study of ancient life.

Gastropod – (440 MYA Silurian – Recent) This large class of mollusks has been able to live in a large variety of habitats. Most shells composed of calcium carbonate. Many species of gastropods, such as the snail, are still living today

Echinoid – (500 MYA Ordovician – Recent) This echinoderm or sea urchin was covered with tiny spines. These marine animals floated freely along the sea floor. As most echinoderms, they have radial symmetry.

Goniatite – (410-245 MYA Devonian – Permian) This shelled, marine animal swarmed the Carboniferous sea shelves and reef structures. The shape of its shell suggests that Goniatites were poor swimmers.

Cephalopod – (500 MYA Ordovician – Recent) This highly developed marine mollusk is represented today by the squid and octopus. Most fossil forms had shells which were either straight or coiled. The animal lived in the outermost chamber.

Petrified Wood – (60 MYA Eocene – Recent) In petrified wood, silica has replaced the original woody structure. Sometimes this replacement is so perfect that the cells and annual rings show clearly. Oak and Pine trees are common fossils.

Dinosaur Bone – (245 – 65 MYA Triassic – Cretaceous) Dinosaurs dominated the land during the Mesozoic Era. These large reptiles left many bone pieces behind as fossils. Their extinction at the end of the Cretaceous is still largely unexplained.

Pelecypod – (210 – 40 MYA Jurassic – Eocene) The Devil's Toe Nail, or, the Gryphaea, is unique because the two valves of the outer shell are grossly unequal in size and shape. The left valve is loosely coiled, while the right valve is flat and lid-like.

Horn Coral – (500-245 MYA Ordovician – Permian) Solitary species of Tetracorals are known as Horn Corals. They lived in the warm shallow seas. They derived their name from the horn or tube-like shape of their shells.

Crinoid – (440-360 MYA Silurian – Devonian) Flower-like echinoderms, often beautifully colored that lived in colonies attached to the sea floor. This fossil had a radial symmetry like today's starfish.

Trilobite – (550 – 245 MYA Cambrian – Permian) Common three-lobed marine arthropods (insects). They were bottom feeding scavengers and predators. Trilobites are Wisconsin's state fossil.

Shark Teeth – (150 MYA Cretaceous – Recent) These belonged to one of the planet's largest predators. Fossils consist of the root, crown and serrated edge. Sharks prowled the warm seas, feeding on many marine animals.

Brachiopod – (550 MYA Cambrian – Recent) These shelled-bivalves were abundant in the Paleozoic Sea. The lived attached to the shallow sea bottom by a stalk which emerged from the rear of one of the shells or valves.