CRYSTAL CAVE

Wisconsin's Longest Show Cave
Educational Program

Cave Tour Lesson Plan
Grades 3-4

Objectives:

At the end of this program, the student should be able to:
- Define cave related vocabulary
- Explain what a cave is
- Tell how a cave forms in general terms
- Name at least 3 cave formations
- Express a connection between what is above ground and what is below ground

Wisconsin DPI Standards

Science:
A.4.1, A.4.2, A.4.3, A.4.4, A.4.5, B.4.1, B.4.3, C.4.1, C.4.2, C.4.8, D.4.1, D.4.2, D.4.3, D.4.4, D.4.8, E.4.1, E.4.2, E.4.3, E.4.5, E.4.6, E.4.7, E.4.8
Social Studies:
A.4.1, A.4.2, A.4.5, A.4.7, B.4.7, E.4.12

Minnesota Academic Standards

Science:
3.1.1.1.1, 3.1.1.2.1, 3.1.3.2.1, 4.3.1.3.1, 4.3.2.3.1

Activities:

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

10 minutes: The visual presentation provides the history and discovery of the cave, definition of a cave, formation of sedimentary rocks, how caves form, fossils in the cave, different types of cave formations, the type and hibernation of bats, and the ecology of caves.

60 minutes: The Cave Tour fosters a connection between previously discussed cavern features and formations with the experience of the actual cave environment. A knowledgeable guide shows the group through 11 rooms on three levels.

Pre-teach Vocabulary:

A glossary of terms is provided for your convenience.

Acid - A substance that produces ions when it is dissolved in water. Acids can breakdown (dissolve) rocks and minerals.

Calcite - A mineral composed of calcium carbonate. Most cave formations are made of calcite.

Cave - A hole in rock that was made by nature and is large enough for a person to fit into.

Column - A formation which is formed when stalagmites meet overhanging stalactites. Water flowing down the sides of the column gradually enlarges it by adding layers of calcite.

Dissolve - To breakdown a substance into smaller more dilute particles.

Environment - All external conditions which surround a living thing.

Erosion - The set of processes by which materials are removed or transported by wind, water, ice or gravity.

Fossil - Any remains or traces of animals or plants that lived in the past. These can include bones, tracks, casts or imprints.

Geologist – A scientist who studies the earth and the materials that form it.

Limestone - A carbonate-rich sedimentary rock which usually forms from layers of the remains of marine life and other marine sediments.

Mineral - A naturally occurring, solid element or compound, with a definite composition and a regular internal crystal structure.

Rock - A solid, cohesive aggregate of one or more minerals or mineral materials.

Sinkhole - A circular depression on the surface formed by ground collapsing into a cavity below.

Speleologist - A scientist who studies caves.

Speleothem - A general term for any mineral deposit or formation found within a cave, such as a stalactite or stalagmite.

Stalactite - A formation which develops when water deposits minerals in successive rings downward from the ceiling of a cave.

Stalagmite - A formation which builds upward from a cave floor as the result of water dripping from above. They are usually located beneath a stalactite.

Learning Extension:

Try this activity after your visit to reinforce important concepts.

You will need:
~ 30 sugar cubes
~toothpicks
~clear fish tank (w/ straight sides)
~1 spray bottle filled with water
~ 2 lbs of modeling clay

Directions:

1. Make a limestone model using the sugar cubes. Stack sugar cubes against inside of tank. Make the structure at least 4 cubes high and wide and at least 3 cubes deep. A few columns may have 1-2 more cubes

2. Now cover the model with surface soil. Cover the sugar structure with about ⅛ inch modeling clay. Be sure there are no gaps.

3. Poke holes with a toothpick through the clay and into the sugar.

4. Simulate rain with the spray bottle. Make and record observations

Questions: What happens to the limestone (sugar) as the water moves through the soil (clay)? Why? What happened to the sugar? Where do you think the sugar went? How long do you think it might take if this was actual limestone rock?

Discuss: Limestone is dissolved by a weak acid that moves through the cracks and fissures of the rock. Over a long period of time, a cavern forms. The dissolved limestone is re-deposited into the cave as speleothems.