



# CAVE OF THE MOUNDS®

National Natural Landmark

## Educational Programs

### SpeleoQUEST

Cave Mini-Course

Grade 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 solution cave forms in general terms
- Name at least 3 cave formations
- Express the 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

#### 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 cave, process of the formation of sedimentary rocks, how caves form, and how cave formations are deposited.
- 30 minutes      Outside Karst Tour shows above ground features that indicate the presence of caves, shows examples of local geology, and traces the path of Cave of the Mounds from above the ground.
- 50 minutes      The Cave Tour fosters a connection between previously discussed cavern features and formations with the experience of the actual cave environment.

#### Pre-teach Vocabulary:

A glossary of terms is provided for your convenience.

Cave	Mineral	Column
Speleothem	Fossil	Speleologist
Stalactite	Rock	Calcite
Stalagmite	Geologist	Environment
Acid	Limestone	Erosion
Dissolve	Sinkhole	

#### Learning Extension:

Try this 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

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 1/8 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.

## Glossary of Terms

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

**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.

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

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

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

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

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

**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.

**Sinkhole** - A circular depression formed by ground collapse into a solution cavity.

**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.

**Speleologist** - A scientist who studies caves.

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

**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.