

CRYSTAL CAVE

Wisconsin's Longest Show Cave Educational Program

Cave Tour with gem panning Lesson Plan Grades K-2

Objectives:

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

- Identify cave related vocabulary
- Describe what a cave is
- Tell how a cave forms in general terms
- Name at least 2 cave formations
- Recognize a connection between what is above ground and what is below ground
- Identify rock related vocabulary
- Name at least one rock type

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, D.4.3,
D.4.12, E.4.1

Minnesota Academic Standards

Science:

0.1.1.2.1, 0.2.1.1.1, 0.4.2.1.1, 1.1.1.1.1,
1.1.3.1.1, 1.3.1.3.1, 1.3.1.3.3, 1.4.2.1.1,
1.4.2.1.2, 2.1.1.2.1

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.

15 minutes: Sluicing give participants a hands-on experience to uncover their own collection like a true geologist. Guided identification shows examples of both local/non-local rocks & minerals

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

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 flowstone to the surface.

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

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.

Geology – Scientific study of the earth and earth materials.

Igneous – A type of rock formed from molten or partially molten material cooling and hardening either above or below the surface of the earth.

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

Metamorphic – A type of rock changed from its original form (sedimentary or igneous) and/or composition by heat, pressure, or chemically active fluids, or some combination of them.

Mineral- The materials that make up rocks (naturally occurring solid element or compound with an internal crystal structure).

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

Sedimentary – A type of rock formed from the accumulation of sediment, which may consist of fragments and mineral grains of varying sizes from pre-existing rocks, remains or products of animals and plants, or the products of chemical action.

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.

Cave Learning Extension:

Try this activity after your visit to reinforce important concepts.

Recommended for Kindergarten

1. Have the children help you make fruit punch using uncolored Kool-Aid and sugar.
2. Give children a sample of plain water to taste. Then, give a sample of the drink mixture.

Questions: How did each look? How did each taste? Why?

Discuss: Water can combine with other substances to make a solution. Sometimes you cannot tell if there is another substance just by looking at it. A weak acid solution (rain + carbon dioxide) is what caused the cave to form inside the rock at Crystal Cave.

Recommended for Grades 1 & 2

1. Give each child 3 cups (4 oz.). Place ½ tsp salt in 1 cup and ½ tsp sugar in another cup.
2. Pour 2 oz of warm water into each of the three cups and ask the children to stir each for 1 minute.
3. Have the children make observations about each cup by color & taste.
4. Have each child (or in partners) make a simple chart to record observations and compare solutions.

Discuss: See Kindergarten discussion above. Add: As the weak acid solution moved through cracks in the rock, it dissolved and carried other minerals with it.

Gem Panning Learning Extension:

You will need:

- ~ Each student's collection of gems
- ~ Gem and Mineral identification sheet

Directions:

1. Have each student look at the gems and minerals that they found while gem panning and compare them to the identification sheet.
2. Have the students identify all of their collection.
3. Have the students make and record observations about their collections.
4. As a class make observations of the type and quantity of gems and minerals found.

Questions: What type of gems and minerals were found? Which were the most abundant and which was the rarest? Where there some that were hard to identify? Why?

Discuss: The different characteristics of each gem and mineral and if they have any uses or where students have seen them before.