



Science Unit | Grades 6-12 | Lesson 1: Spelunkin' In Marvel Cave

Lesson Description

Have you ever wondered what it was like to be a real cave explorer? Well gear up and hold on as you join one of Silver Dollar City's cave guides (or spelunkers) through Marvel Cave, one of Missouri's deepest treasures. Learn about Marvel Cave's beginning, its rock formations, its living creatures and other fun facts along the way.

Concepts

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|---------------|--------------|
| Calcite | Stalagmite |
| Carbonic Acid | Troglobites |
| Echo Location | Troglophiles |
| Stalactite | Trogloxenes |
| Speleothems | |

Objectives

Students will:

- Be able to differentiate between a stalactite and a stalagmite.
- Give examples of creatures living in Marvel Cave.
- Identify speleothems around Marvel Cave.
- Understand the effect of geography and climate on plant and animal life inside the cave.
- Learn how human activity impacts the ecology of the cave.

Content Standards

GLE: SS 3c 1.9; SS 5a, b, c, j

National Standards in Science

- **Standard 2:** Understands Earth's composition and structure.
 - Benchmark 1, Grades K-2: Knows that Earth materials consist of solid rocks, soils, liquid water, and the gases of the atmosphere.
 - Benchmark 1, Grades 3-5: Knows how features on the Earth's surface are constantly changed by a combination of slow and rapid processes (e.g., slow



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- processes, such as weathering, erosion, transport, and deposition of sediment caused by waves, wind, water, and ice; rapid processes, such as landslides, volcanic eruptions, and earthquakes).
- Benchmark 3, Grades 3-5: Knows that rock is composed of different combinations of minerals.
 - Benchmark 3, Grades 9-12: Knows that elements exist in fixed amounts and move through the solid Earth, oceans, atmosphere, and living things as part of geochemical cycles (e.g., carbon cycle, nitrogen cycle).
- **Standard 6:** Understands relationships among organisms and their physical environment.
 - Benchmark 2, Grades K-2: Knows that living things are found almost everywhere in the world and that distinct environments support the life of different types of plants and animals.
 - Benchmark 3, Grades 3-5: Knows that an organism's patterns of behavior are related to the nature of that organism's environment.
 - Benchmark 2, Grades 6-8: Knows factors that affect the number and types of organisms in an ecosystem can support (e.g., available resources; abiotic factors such as quantity of light and water, range of temperatures, and soil composition; disease; competition from other organisms within the ecosystem; predation).
 - Benchmark 1, Grades 9-12: Knows how the interrelationships and interdependencies among organisms generate stable ecosystems that fluctuate around a state of rough equilibrium for hundreds or thousands of years.
 - Benchmark 3, Grades 9-12: Knows that as matter and energy flow through different levels of organization in living systems and between living systems and the physical environment, chemical elements (e.g. carbon, nitrogen) are recombined in different ways.

Time Required

Up to 60 minutes – Use teacher discretion for determining grade level

Materials

- Guided tour through Marvel Cave at Silver Dollar City
 - Student activity sheet from Kids-U-Cation website
 - Writing utensil
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Procedures

1. Follow the tour guide as he/she tells the history of Marvel Cave and emphasizes points of interest throughout the tour.
 2. Fill out the student activity sheet that goes along with the tour.
 3. Turn in the activity sheet to the teacher for a participation or completion grade.
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Closure

Review the key points of this lesson by discussing the following:

- What is the difference between a stalactite and stalagmite?
 - Give 3 facts you learned about the cave.
 - Name one of the rooms in Marvel Cave.
 - Name one of the creatures that lives in Marvel Cave and why the cave environment is ideal for its survival.
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Assessment/Independent Practice

Give an assignment or test of your choice.

Spelunkin' In Marvel Cave

(Version A)

In order to answer the following questions, you have to become one of Marvel Cave's many cave explorers or "spelunkers". Take the tour and travel hundreds of feet below the earth's surface to discover one of Missouri's deepest treasures.

True or False: Circle the correct answer

- True False 1. Marvel Cave with its Cathedral Room has one of the largest cave entrance rooms in America.
- True False 2. It was first discovered by the Aztec Indians around 1500 A.D.
- True False 3. Hearing strange noises coming deep within the entrance pit, the Indians named it the Devil's Den and never entered.
- True False 4. To warn coming visitors, local Indians carved V-notch warnings into the trees around its perimeter.
- True False 5. Rock formations that defy gravity and grow toward the cave's ceiling are called stalactites.
- True False 6. Bats are blind.
- True False 7. Each night when not in hibernation, a bat can consume enough insects to equal one-half its body weight.
- True False 8. In the late 1800s, guano mining was profitable: for each ton sold the mining company received nearly \$500.
- True False 9. Green plants can grow in darkness.
- True False 10. At the end of the tour and on a clear day, if one looks to the south you can see the Boston Mountains in Arkansas—40 miles away.

Fill In The Blank: (continued on page 2)

- 1. The "Sentinel" formed a _____ when a _____ and a _____ joined.
- 2. _____ is the mineral deposited in Ozarks' caves to form varied columns of stone, hanging rock draperies and delicate crystal structures.
- 3. Name two animals that live in Marvel Cave: _____ and _____.
- 4. _____ dissolves carbon dioxide found in the soil and air to form a weak acid solution called carbonic acid. As this solution moves downward, it slowly dissolves the _____. On contact with the cave atmosphere, carbon

dioxide is released from the solution resulting in small deposits of crystallized calcite, forming a _____ or other speleothems.

5. Growth rates of speleothems can vary greatly, averaging from 25 to 100 years to form _____.
6. The Gray Bat travels and finds its prey based on _____.
7. Bat guano has a high nitrate content and was used in _____ after processing.
8. The world's underground altitude record was set in the Cathedral Room on July 7, 1963 when a _____ made history at the helm of Don Piccard only 4 months after he made the first successful crossing of the English Channel.
9. On the south side of the Egyptian Room is a vertical drop of 124 feet called the _____. This Terminal Dome Pit was believed to be bottomless.
10. In 1994, _____ hot-air balloons were flown in the Cathedral Room.



Did you know...?



- In the beginning stages of Marvel Cave exploration, bat guano was over 25 feet deep in some areas!
- Animals that permanently live in darkness are called Troglobites.
- For the most part, the Cathedral Room stays at a constant 54°F.
- At one time there were over 200,000 gray bats living in Marvel Cave! But don't worry, many of those bats have moved on to new homes; however we still have a steady population of bats living in certain areas of Marvel Cave.
- The Ozark Blind Cave Salamander, which was discovered in Marvel Cave, is on the rare and endangered species list.
- Animals which never complete their entire life cycle in a cave and enter mainly for hibernation or refuge are called Troglonexes. Some examples are: bats, bears, raccoons, humans, squirrels, etc.
- Cave crickets, some salamanders, and beetles are examples of Trogliphiles which are animals that normally live in the dark zones of a cave but can live outside the cave also.