

Cave Interpretation

Teacher's Guide

Subject: Integrated Science (Life; Earth-Space; Physical)

Topics: This interpretive walk introduces the students to the mechanical and chemical activities that shape and reshape the Earth's land surface by eroding rock and soil in some areas and depositing them in other areas.

Summary: Students are led on brief (~20 minute) tour of the main cave (back room only). They will view cave formations and learn of the processes that created the formations. Students will answer discussion questions after tour is complete.

Objective(s): After completing the field lab, students will be able to:

1. Explain the process of weathering and erosion, part of the "rock cycle"
2. Understand what a sedimentary rock is and how it is formed.
3. Recognize six common cave formations.
4. Determine how fossils can be used to explain changes in earth's environments.
5. List and describe common adaptations of cave organisms

Ecosystem(s): Karst; Caves

Equipment:

- Tour Guide
- Flashlight (optional)
- Cave organisms
- Helmet (optional)
- Thermometer
- Calculator

Background (Pre-field Classroom Activity)

- Reference Material:
 - Florida Museum of natural history: <http://www.flmnh.ufl.edu/nwfla/cave.htm>
 - Spike science projects: <http://spikesworld.spike-jamie.com/science/geology/c142-29-mineral-deposits.html>
 - Discovery Lesson "Caves": <http://school.discoveryeducation.com/lessonplans/programs/nonmetals/>
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- Vocabulary: *International System of Units; Limestone, Sedimentary, Stalactite, Stalagmite, fossil, Chemical weathering; lux (lx) the SI unit for measuring the illumination (illuminance) of a surface or "the amount of light received per unit of surface area is measured in lux (1 lux = 1 lumen/square meter). One lux is equal to approximately 0.09290 foot candle. Chemical weathering and cave formation: Limestone is not soluble in water. When carbon dioxide (from decaying plants in the soil above the cave) mixes with water, it forms a very weak carbonic acid. This turns the calcium carbonate into calcium bicarbonate, which dissolves. When drips are exposed to air in the cave, a little carbon dioxide escapes from them into the atmosphere, which reverses the process and precipitates a small amount of calcium carbonate. The upper average rate for limestone stalactite growth is ten centimeters per thousand years, with lower growth rates outside of tropical areas. (Source: <http://www.talkorigins.org/indexcc/CD/CD250.html>).*

Procedure (Engage; Explore; Explain)

1. Assemble students at the back door of the cave.
2. Ask students what types of features they think that they will see in the caverns. Complete hypothesis.
3. Explain to students that they will be led on a short interpretive tour of the back room of the cave. Explain that it is important for them to listen to the program in order to complete the discussion questions.

Sunshine State Standards

Science: SC.D.1.3.1; SC.H.1.3.4; SC.H.2.3.1; **Language Arts:** LA.A.1.3.3; LA.B.2.3.1; LA.C.1.3.1; **Mathematics:** MA.B.1.3.3; MA.B.3.3.1; MA.B.4.3.1-2; MA.D.2.3.1; **Social Studies:** SS.A.2.3.4; SS.A.3.3.3; SS.A.6.3.5

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Student Data Sheet

General Information

Full Name:		Date:	
School (teacher):		Time:	

Student Hypothesis

If caves have no light then I expect to see (circle one: no or many) plants, because . . . _____

Discussion Questions

1. What clues have been found that tell us that the caves were once under water?

2. When rain falls though the atmosphere and soil, it forms carbonic acid. Explain what happens when the carbonic acid flows into the ground.

Is this a physical change or a chemical change?

3. How are the formations in the caves formed? Hint: evaporation is involved.

Stalactite:

Stalagmite:

Column:

4. Why is the temperature in the cave a constant 65°F? How is this similar to the temperature of water coming out of a spring?

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Student Data Sheet (cont.)

5. Why do different formations have different colors?

6. How can pollution on the surface affect the earth systems below the surface?

7. What kind of rock is in the caves? Choose one of the following.

- a. metamorphic
- b. conglomerate
- c. sedimentary
- d. igneous

8. What types of animals live in caves? Why would anything want to live in a cave?

9. What is the difference between a stalactite and a stalagmite?

10. If Stalactites grow an average of 10 mm every 1000 years, than how old would a 65 mm stalactite be?

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Matching

Identify the following cave formations by matching the name to the formation.

Stalactite



Soda Straws



Stalagmite



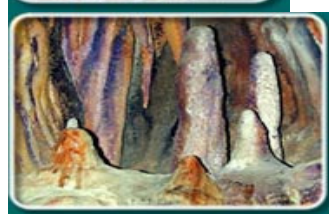
Bacon



Rimstone Pools



Column



Pictures by Dale John