

# Speleothems: A Webquest

**Lesson Objective:** After completing this webquest, students will have learned the fundamental characteristics of 14 of the most common types of speleothems.

**Key Concepts:** cave balloons, boxwork, cave flowers, coatings, columns, coralloids, draperies, flowstone, frostwork, helictites, moonmilk, cave pearls, stalactites, and stalagmites.

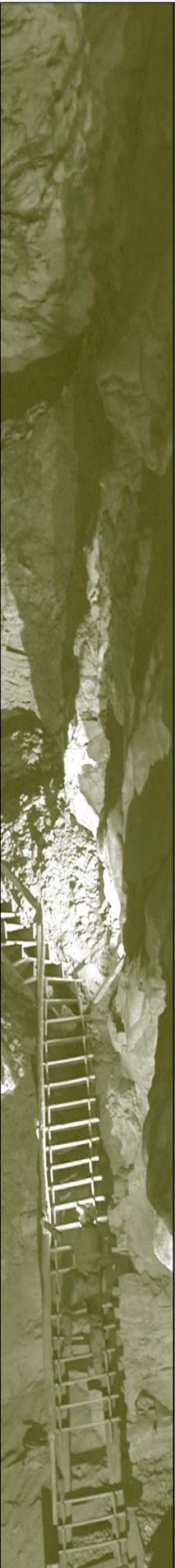
**Duration:** 1 55-minute class period

**Audience:** Middle school and high school students



Speleothems: A Webquest

# Teacher Copy and Answer Key



# Speleothems

## Teacher Copy and Answer Key

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**Follow the directions below to access the “Views of the National Parks” Multimedia Education Program.**

- 1.) Open the Views of the National Parks program using a Views CD/DVD or the internet at:  
<http://www2.nature.nps.gov/views/#>
- 2.) Select the “Multimedia Version”
- 3.) Open the “Knowledge Centers”
- 4.) Click on “Caves and Karst”
- 5.) Enter the module by clicking on “Explore Caves and Karst”
- 6.) Click on “Underground” in the top menu bar
- 7.) Select the “Speleothems” side bar

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**Answer the following questions as you read through the speleothems section of the Caves and Karst Knowledge Center.**

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1. The one thing that all speleothems have in common is where they form. Explain how the water table influences the formation of caves and their speleothems.

*ALTHOUGH THE FORMATION OF CAVES TYPICALLY TAKES PLACE BELOW THE WATER TABLE IN THE ZONE OF SATURATION, THE DEPOSITION OF SPELEOTHEMS IS NOT POSSIBLE UNTIL CAVES ARE ABOVE THE WATER TABLE IN THE ZONE OF AERATION. AS SOON AS THE CHAMBER IS FILLED WITH AIR, THE STAGE IS SET FOR THE DECORATION PHASE OF CAVE BUILDING TO BEGIN.*

2. What does the term “speleothem” refer to? Give an example.

*IT REFERS TO THE MODE OF OCCURRENCE OF A MINERAL - I.E., ITS MORPHOLOGY OR HOW IT LOOKS IN A CAVE, NOT ITS COMPOSITION*

3. What is the most common cave mineral?

*CALCITE*

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Learn about 14 different types of speleothems by clicking on each type and then answering the following questions.

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1. Cave Balloons

- a. Complete the following sentence about cave balloons:

“Cave balloons are ROUND - shaped, THIN - walled speleothems with GAS inside of a mineralized bag-like POUCH .”

- b. Explain why cave balloons are so rare and fragile.

*IT IS BELIEVED THAT BALLOONS ARE SHORT-LIVED; THEY QUICKLY DRY, CRACK, DEFLATE, AND CHANGE IN LUSTER (ESPECIALLY IN LOW HUMIDITY ENVIRONMENTS).*

- c. The picture shown is from Mammoth Cave National Park. Name another national park where you could find an impressive display of cave balloons?

*JEWELL CAVE NATIONAL MONUMENT*

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2. Boxwork

- a. What does boxwork resemble?

*BOXWORK RESEMBLES A MAZE OF POST OFFICE BOXES*

- b. What does a mineral need to be in order for it to create boxwork?

*BOXWORK CAN BE COMPOSED OF ANY MINERAL MORE RESISTANT THAN IT'S SURROUNDING MEDIUM.*

- c. Boxwork is mostly composed of what mineral?

*CALCITE*

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3. Cave Flowers

- a. What is the mineral that typically forms cave flowers?

*GYPSUM*

- b. Use the picture and text to name 2 national parks where you can find gypsum flowers.

*CARLSBAD CAVERNS and MAMMOTH CAVE NATIONAL PARKS*

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#### 4. Coatings

a. List 4 places in a cave that you could find cave coatings:

- *WALLS*
- *FLOORS*
- *CEILINGS*
- *POOLS*

b. What type of cave mineral can form cave coatings? Be specific and use examples.

*PRACTICALLY EVERY CAVE MINERAL KNOWN CAN FORM COATINGS. THIS INCLUDES COMMON MINERALS, LIKE CALCITE AND ARGONITE, AS WELL AS RARE MINERALS THAT CONTAIN ELEMENTS SUCH AS MAGNESIUM AND IRON.*

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#### 5. Columns

a. How is a column formed?

*COLUMNS FORM WHEN A STALAGMITE GROWS TOGETHER WITH ITS COUNTERPART FEEDER STALACTITE.*

b. Why are the largest cave columns usually found along ceiling joints?

*THIS IS WHERE THE GREATEST AMOUNT OF WATER IS DRIPPING INTO A CAVE.*

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#### 6. Coralloids

a. What does the term coralloid describe?

*CORALLOID (OR CORALLITE) IS A CATCHALL TERM THAT DESCRIBES KNOBBY, NODULAR, BOTRYOIDAL, OR CORAL-LIKE SPELEOTHEMS.*

b. List 3 examples of speleothems that can be considered coralloids:

*Possible answers include:*

- *CAVE POPCORN*
- *CAULIFLOWER*
- *GRAPES*
- *GLOBULARITES*
- *KNOBSTONE*
- *GRAPEFRUIT*
- *CORAL*

c. Where can coralloids form?

*CORALLOIDS CAN FORM BOTH IN THE OPEN AIR AND UNDERWATER.*

## 7. Draperies

- a. Describe the formation of cave draperies.

*DRAPERIES FORM WHEN WATER DROPS FLOW DOWN A SLOPED CEILING BEFORE DRIPPING TO THE FLOOR, AND CALCITE BUILDS UP IN A LINE. THESE LINES GRADUALLY BUILD UP TO FORM DRAPERIES.*

- b. What are 2 sources that can give draperies bacon-like stripes?

*IRON OXIDE OR ORGANIC SOLUTIONS*

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## 8. Flowstone

- a. What is flowstone usually composed of?

*CALCITE OR OTHER CARBONATE MINERALS*

- b. How are the minerals of flowstones deposited?

*FLOWING WATER DEPOSITS MINERALS IN LAYERS OR BANDS*

- c. Explain the difference between flowstone and coatings.

*FLOWSTONES FORM FROM DEPOSITS OF FLOWING WATER;  
COATINGS FORM FROM DEPOSITS OF SEEPING WATER.*

- d. Flowstones can resemble a petrified or frozen \_\_\_\_\_ *WATERFALL* \_\_\_\_\_.
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## 9. Frostwork

- a. The needle-like habit of what type of mineral gives most frostwork their particular appearance?

*ARAGONITE*

- b. Frostwork is most commonly found with \_\_\_\_\_ *CORALLOIDS* \_\_\_\_\_.

- c. Explain a downside to the dazzling beauty of frostwork.

*THEIR BEAUTY MAKES THEM PRIME TARGETS FOR VANDELISM.*

10. Helictites

- a. What is the Greek root for the term helictite, and what does it mean?

*IT COMES FROM THE GREEK ROOT "HELIX", MEANING "TO SPIRAL".*

- b. What is the one thing that all helictites have in common?

*THEY ALL POSSESS TINY CENTRAL CHANNELS THROUGH WHICH THEIR EXTREMITIES AND DIAMETERS ARE FED AND INCREASED BY SEEPING CAPILLARY WATER.*

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11. Moonmilk

- a. What does the milky appearance of moonmilk form from?

*MOONMILK'S FINE-GRAINED PARTICLES BECOME SUSPENDED IN WATER WHICH GIVES IT THE APPEARANCE OF MILK.*

- b. What are 4 medicinal purposes of moonmilk?

- *A POULTICE TO STOP BLEEDING*
  - *FOR DIARRHEA*
  - *FOR FEVERS*
  - *AS AN ANTACID*
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12. Cave Pearls

- a. List 4 objects that cave pearls have been compared to:

*Possible answers include:*

- *MARBLES*
- *CIGARS*
- *BALLS*
- *HAILSTONES*
- *ORANGES*
- *PEARLS*
- *CUPCAKES*
- *PIGEON'S EGGS*

- b. Where do cave pearls normally grow?

*IN SHALLOW CAVE POOLS*

- c. How do sand grains and bat bones influence the growth of cave pearls?

*THEY CAN ACT AS NUCLEI FOR CAVE-PEARL GROWTH; THEY BECOME ROUNDED AS THEY GROW INTO CAVE PEARLS OF DIFFERENT SHAPES.*

13. Stalactites

- a. What do stalactites resemble and where are they found?

*STALACTITES RESEMBLE ICICLES OR CARROTS HANGING FROM CAVE CEILINGS*

- b. What do all stalactites begin their growth as?

*SODA STRAWS*

- c. Describe the first stage in the growth of a stalactite.

*A WATER DROPLET COLLECTS ON THE CAVE CEILING BY CONDENSATION OR BY WATER COMING THROUGH A FRACTURE IN A ROCK.*

- d. What sticks or “adheres” the thin film of carbonate material left behind by a water droplet to the ceiling of a cave?

*SURFACE TENSION*

- e. As long as water continues to drip, what eventually develops and is enlarged by the dripping water?

*A HOLLOW TUBE (OR SODA STRAW)*

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14. Stalagmites

- a. What are stalagmites?

*THEY ARE CONVEX FLOOR DEPOSITS BUILT UP BY WATER DRIPPING FROM AN OVERHEAD STALACTITE OR FROM THE CAVE CEILING.*

- b. How does the splash of falling water droplets affect the growth of stalagmites?

*IT CAUSES THE STALAGMITES TO SPREAD OUT AS THEY GRADUALLY BUILD UP FROM THE FLOOR*

- c. Describe the difference between the top of a stalagmite and the tip of a stalactite.

*STALAGMITES HAVE ROUNDED TOPS; STALACTITES HAVE POINTED TIPS.*