Caves: The World Underground

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How Caves are Formed

The receding of the shallow tropical sea left layers of limestone (calcium carbonate) and dolomite in the ground.

Rainwater is naturally acidic. As rain falls through the atmosphere, it picks up dissolved carbon dioxide and forms a weak carbonic acid solution. When the slightly acidic rainwater falls on limestone or dolomite, the bedrock begins to dissolve.

Starting with fissures and fractures in the bedrock, the acidic water liquefies the carbonate rock forming an underground network of channels and caves. The caves recapture some of the lost calcium carbonate in the form of layered rock deposits. The best known example of this is the stalactites that hang from cavern ceilings.

The stalactites are formed from supersaturated calcium carbonate solution as it drips from the ceiling. As the water evaporates, it leaves limestone behind usually in a conical shape.

The supersaturated solution may also splash on the cavern floor creating stalagmites growing upwards. Stalactites and stalagmites take hundreds of thousands of years to form. When the stalactite and stalagmite meet to form a solid cone shape from ceiling to floor, we call this a column.

What Can You Find Inside a Cave?

Stalactites

Columns

Stalagmites

New York State Standards

Middle School Activity

Standard 1: Analysis, Inquiry and Design, Scientific Analysis:
Key Idea 1: s1.1a, s1.2

Standard 4: Physical Setting
Key idea 2: 2.1i, 2.2g
Key idea 3: 3.1b

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VOCABULARY
Calcium Carbonate
Columns
Limestone
Stalactites
Stalagmites
Supersaturated

HELPFUL TERMS
Acidic
Bedrock
Conical shape
Dissolve
Evaporates
Activity: Stalactites and Stalagmites

What to do:

1. Fill both cups nearly full with warm water.

2. Mix Epsom salt in both cups until no more salt can be dissolved, creating a supersaturated solution. This should be at least a 1/4 cup of Epsom salts.

3. Set cups apart with plate sitting in between them.

4. Cut a length of string long enough to reach from the bottom of one cup to the bottom of the other. Wet the string and tie a weight to each end. Add some Epsom salt crystals to the moist string and some to the plate below the area where the salt mixture will drip. This will provide a starting point for the crystals to grow.

5. Drop one end of string into each cup. The string should be hanging over the plate.

6. Over the course of several days to a week, stalactites and stalagmites should begin to form. Each day, add more Epsom salts to each water mixture.

Modifications: Try using an unwaxed paper plate and another set up with a hard plastic plate to see if there is any difference in crystal formation.