

# MINERALS AND MANNERS

## BACKGROUND INFORMATION:

After the water table drops and the passageways are formed within a cave the formations or speleothems begin to form. Water seeps through cracks in the limestone and dissolves a mineral within the rock called calcite. If the water encounters an open room, it will leave a thin layer of calcite clinging to the rock. Over thousands of years, the layers of calcite build up. This is the reverse process by which limestone is dissolved to produce caves. Speleothems consist mainly of calcite, the same mineral that makes up limestone.

## SUMMARY:

(Cooperative groups) This activity will let the students see how speleothem formation can be simulated. They are to follow directions carefully and write down everything they observe during the next five days. After the five days the students will share their experiment with the class and report their findings.

## STEP BY STEP:

1. Put students into groups of three. Have the students organize themselves to have a recorder/timer, materials person, and a spokesperson.
2. Prepare boxes or trays with the ingredients for experiment. Make sure there is room to set aside each of the group's experiments for several days.
3. Explain that speleothems are cave formations. Speleothems differ in shape and colors. The most common known speleothems are stalactites, which hang from the ceiling, and the ones that grow from the floor are stalagmites. Speleothems are formed when water carrying tiny bits of dissolved rock enter an open space in a cave. When the water evaporates, the dissolved rock begins to solidify. The speleothems in Kartchner Caverns are beautiful because the cave has remained untouched for thousands of

years allowing the formations to grow successfully. The rich colors blended with the speleothems are created by different minerals that have mixed with the calcite solution.

4. Have each group of students place a shoe-box lid, open side up, on the table and to set a cup inside each end of the lid.
5. Instruct them to fill the cups with hot water, adding baking soda a little at a time until there is slightly more than will dissolve in the water.
6. Have them add some food coloring to the water and stir.
7. Soak string in water for a few minutes before attaching to nails. Each group will need to tie each end of the three lengths of string to a nail. Show how to drop one nail into each cup so that the strings are suspended between the cups, hanging at least two inches below the rims of the cups.
8. On their group record sheet, have the recorder write down exactly what the group did to prepare their experiment. Set aside experiments until the next day.
9. Over the next week, have the students observe their experiment and write down any changes they see. Within one or two days the strings will become saturated and water will begin to drip onto the box lid. As the water evaporates, the baking soda will become solid, hanging from the strings like stalactites and building up on the lids like stalagmites. Allow the formations to grow for a full week.

## ASSESSMENT:

After a week, have each group show their experiments and tell what they observed. Have the students notice any difference between group experiments. What made the differences?

**SUBJECT:** Cave Features

**MATERIALS:** hot water, clear plastic cups, baking soda, food coloring, shoe box lids, stirring spoons, long nails, magnifying glasses, cotton string, copies of record sheet

**GRADE LEVELS:** 4-6

**TIME:** 3 to 5 days with 45 minutes the first day and 10 minutes each subsequent day.

**OBJECTIVES:** Students will be able to explain the growth of stalactites, stalagmites, columns and other speleothems found in Kartchner Caverns.

**CONCEPTS:** Cave minerals and the manner in which they are deposited determines the speleothem's shape and colors.