

A RECIPE FOR SPELEOTHEMS

GRADE LEVEL:

Elementary/Intermediate

SUBJECT: Science (Unifying Concepts, Physical, Earth)

Related Colorado Content

Standards: SC1, SC2, SC4, SC6

TIME: 30 Minutes for the demonstration, several days to see results

OBJECTIVE: Students will construct a model to demonstrate the growth of speleothems and crystals via a charcoal garden.

MATERIALS:

- Pie tin
- Pieces of charcoal
- ½ cup water
- ½ cup salt
- ½ cup liquid bluing (can be purchased near detergent in any local grocery store)
- 1 cup ammonia
- Food coloring (do not use red)
- Mixing bowl
- Spoon
- Copies of the Daily Crystal Growth Observation student worksheet

BACKGROUND:

Speleothem is the name given to any cave formation inside of a cave. They are generally formed by calcite crystals deposited by water droplets.

Speleothems form at different rates. Several factors can determine the

rate of growth. Two important factors are rainfall and the outside temperature. As the temperature goes up, so does the decay rate of plants and animals. The more organic material there is in the water, the more calcium carbonate there is in the water; and thus, the more acidic the water is. The rate of speleothem growth increases with the amount of water and with the acidity within the water.

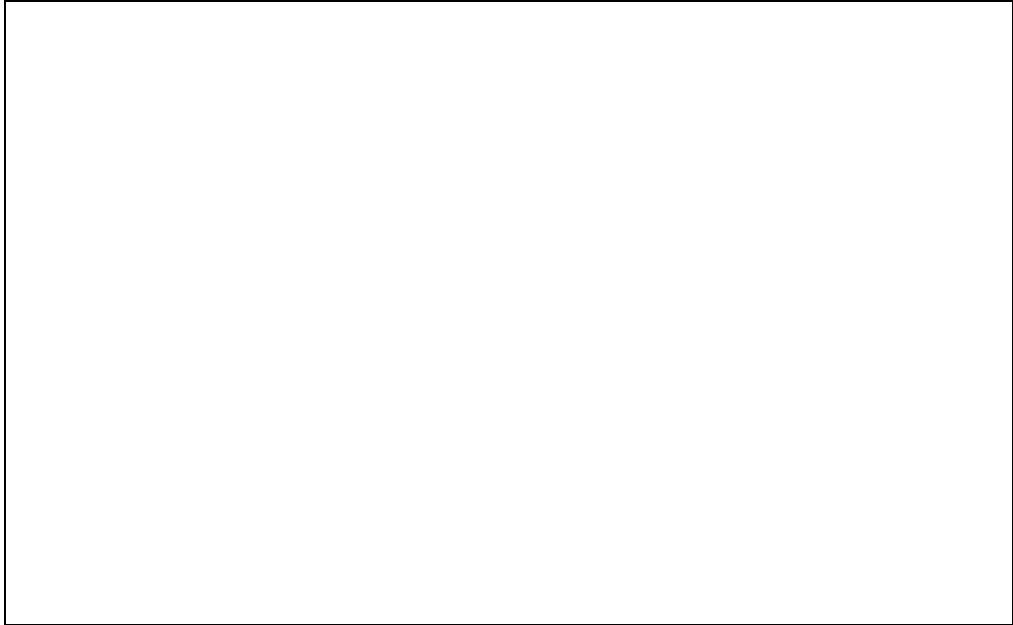
PROCEDURE:

1. Place pieces of charcoal into pie tin (**enough to cover the bottom of the pan**).
2. Mix water, salt, bluing and ammonia in the mixing bowl.
3. Carefully pour this solution over the charcoal so that all pieces are wet.
4. Squirt a few drops of food coloring over the charcoal (**do not use red**).
5. Allow the pan to sit overnight. By the next morning, small crystals should have begun to form on the charcoal.
6. Have the students record observations on the Daily Crystal Growth Observations student worksheet.
7. If crystals are left one week, amazing crystal growth will occur.

Name: _____
Date: _____

DAILY CRYSTAL GROWTH OBSERVATIONS
Student Worksheet

Draw a detailed picture of any crystal growth you observe.



DAY # _____ OBSERVATIONS

In words, describe any changes you have noticed in your crystals' growth. Make sure your answer describes shapes, sizes and patterns of growth.
