Student activity sheet
Activity 2.1

Name: _____

Curious crystals

I woke up the other day and went into the kitchen to get some breakfast. I usually make a waffle or cereal, and my dad usually makes eggs and coffee. My dad added some sugar to his coffee and put a little salt on his eggs. I saw that a few tiny bits of sugar and salt had dropped onto the table. I'd never really thought about it, but I noticed how similar the sugar and salt looked even though I know how different they taste. Anyway, I couldn't think about sugar and salt too much because I had to catch the bus to school. At lunch that day, I had some pretzels and a sugar cookie and it happened again. There they were. I looked very closely at the salt granules on the pretzel and the sugar granules on the cookie. They almost looked like tiny crystals. When I got home that night, I took a little salt and sugar from the cabinet and looked at them with a magnifying glass. While I was at it, I asked if I could look at some other stuff that also looked like crystals. My mom gave me some MSG from the kitchen cabinet and some Epsom salt from the bathroom closet. I looked at all these with a magnifying glass and saw some pretty interesting things.

Take a closer look

Look at a few household crystals to see what you notice about them.

What do Epsom salt, table salt, sugar, and MSG crystals look like?

Procedure

1. Use masking tape and a pen to label four corners of a piece of black construction paper **Epsom salt**, **salt**, **sugar**, and **MSG**. Label the center **unknown**.

2. Place small samples of Epsom salt, table salt, sugar, and MSG on the labeled areas of the construction paper. (Be sure not to taste the crystals.)

3. Use a magnifier to look carefully at each type of crystal.

4. Describe some characteristics of each crystal in the chart on the following page. Include any similarities and differences you notice about them.

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Name: _____

Curious crystals (*continued*)

Epsom salt	Salt	Sugar	MSG

Try this!

Your teacher gave you a crystal sample labeled **unknown**. This crystal is chemically the same as one of the four known crystals.

Can you identify the unknown crystal by comparing its appearance to other known crystals?

Procedure

1. Place a sample of an "unknown crystal" in the center of your piece of black construction paper.

2. Use a magnifier to help you compare this crystal to each of the four crystals you just examined.

1. What similarities do you notice between the unknown and any of the known crystals?

   _____

   _____

   _____

2. Based on your observations, what do you think the identity of the unknown might be?

   _____

3. How certain are you that your guess is correct?

   _____

Name: _____

Curious crystals (*continued*)

What's next?

The appearance test gave you some information about the crystals, but probably not enough to identify the unknown for sure. So you will need to conduct a few other tests. One test could be to crush each type of crystal to see if the unknown breaks in a way that is similar to one of the known crystals. You may also try dissolving each of the crystals in water. Maybe the unknown will dissolve as much as one of the known crystals does. In the next few activities you will help design these types of tests as you try to discover the identity of the unknown.