

Crystal Creatures of Habit

Crystals are substances that have a very rigid shape, or habit. Explore some of the different shapes, or habits, that crystal structures take.

OBJECTIVES

In this activity, you will

- Make observations about crystals.
- Determine the habit of a common crystal.
- Make a model of a crystal structure.
- Identify geometric shapes and solids.

MATERIALS

Computer with ProScope software installed

ProScope

Baggies of common household crystals, labeled by letter to distinguish the different kinds.

Goggles

Black paper or cloth

Lab sheet

Clay

Coffee stirrer straws or toothpicks

PROCEDURE

1. Make sure the ProScope is connected to the computer.
2. Pick up your group's baggy of crystals.
3. Write the letter printed on your baggy at on your lab sheet.
4. Pour a small amount of your crystal substance onto the black paper. Use the ProScope to observe the crystal structure. Draw the shape on your lab sheet. (Look at several different crystals on your paper to see the crystals from different angles to see all sides. Look for sharp, crisp edges. Some may be worn down a little.)

- Record the shapes you see on your lab sheet. Describe the shape you see using geometry terms.
- What do you think your substance might be?
- Use balls of clay and coffee stirrers to make a three-dimensional model of your crystal.
- Now return your baggy to the class table and discuss your findings with the class. Make notes from your discussion on the following table.

Observations Sheet

Write notes about your class discussion. What shapes did your classmates observe in their crystals?

ANALYZE YOUR DATA

Use your observations and the group discussion notes to answer the following questions.

1. What similarities did you notice when you observed the models your classmates made?
2. Describe the characteristics you think would apply to all crystal structures.
3. Label your crystal structure model with its chemical name, the name it may be called in the household, and its uses. Add it to your class crystal display.

Good job!!

Crystal Creatures of Habit

TEACHER NOTES

Now that students have determined the rigid shape that makes a substance a crystal, they will explore the different shapes of common household crystals. The overall shape each kind of crystal takes is called its habit. The term habit is not applied to the internal structure or lattice of the crystal, but simply its characteristic observable shape. There are very involved terms for the shapes crystals may take. If the terms are not familiar to your students, allow them to describe the crystal habits using terms that are familiar. They may describe alum crystals as octahedrons or as two pyramids joined at the base. They could even be described by the shape and number of the faces observed.

The substances used in this activity are readily available at grocery and drugstores. However, sometimes the substances have lost the sharp edges because the individual crystals have rubbed together so much in the container. If this is the case, make a saturated solution (stir the powder into hot water until no more will dissolve) and pour some of the solution into a shallow dish for a few days until the water evaporates and the crystals have grown. These will have sharp edges and will be much easier to observe.

OBJECTIVES

In this activity, you will

- Make observations about crystals.
- Determine the habit of a common crystal.
- Make models of different crystal structures.
- Identify geometric shapes and solids.

MATERIALS

Computer with ProScope software installed

ProScope

Baggies of common household crystals, labeled by letter to distinguish the different kinds. (different kinds of salt, alum, Epsom salts)

Goggles

Black paper or cloth

Lab sheet
Clay
Coffee stirrer straws or toothpicks

POSSIBLE ANSWERS ANALYZE YOUR DATA

Use your observations and the group discussion notes to answer the following questions.

1. What similarities did you notice when you observed the models your classmates made?

Students may compare number of sides, whether they think they have the same substance as another group, and what they think the substance might be.

2. Describe the characteristics you think would apply to all crystal structures.

Students may state that different crystals have different shapes of faces, angles, or corners. Some may wonder if all crystal substances are white or clear in color.

3. Label your crystal structure model with its chemical name, the name it may be called in the household, and its uses. Add it to your class crystal display.

Each substance below is listed by common name, chemical name, possible uses, and the shape.

Salt: sodium chloride; flavoring; cubes

Alum: Potassium aluminum sulfate dodecahydrate; crisping additive for pickles and maraschino cherries, also used in dyes and in paper making; is an astringent (causes shrinkage) and an emetic (causes vomiting); octahedron (two pyramids joined at the base)

Epsom salts: Magnesium sulfate heptahydrate; used as a bath salt for treating bruises and sore muscles, sometimes used as a mild fertilizer; hexahedron (six-faced solid)

Crystal Creatures of Habit Lab Sheet

Name _____ Baggy letter _____

My Drawing

Draw the shape of the crystal.

My Description

Use geometry terms to describe the shape of the crystal.