Geology

Lancaster High School

Name
Date
Block

Introduction to Mineral Crystals

Introduction

Most rocks are composed of minerals. Minerals are inorganic structures formed in nature. Each Mineral has a definite crystal pattern or system. this orderly pattern is derived from the size and arrangement of its atoms. In some cases, this atomic pattern can be observed only in very small fragments of the mineral with the aid of X-rays. Mineral crystals generally fall into one of six groups or systems. The crystal form can be used to help identify the mineral.

In this lab you will construct crystal models of four of the six basic systems, and you will use the models of these systems and the data you collect to identify systems of some common minerals.

Materials

For this experiment you will need:

1. patterns to cut out
2. scissors
3. tape or white glue

Procedure

Students should work independently or in teams as directied by their instructor. Each student should complete his or her own worksheet, while possibly sharing models with each other.

1. Cut out the images on the solid lines.
2. Fold them along the dotted lines carefully. Fold the tabs toward the inside of the model.
3. Use clear tape or white glue to fasten each model clearly as directed by your instructor.
4. Identify each form by its name printed on the side.
5. Count the number of faces (sides) of each model and record information in the table below.
6. Record the geometric shape of the face of each model.
7. Record how many sides are the same in size or are congruent.

System	Number of Faces	Shape of Face	Number of Sides Congruent
Cubic (isometric)			
Orthorhombic			
Tetragonal			
Hexagonal			

Each actual crystal may have corners cut off or broken, and ends that may be pointed; but each, because of axial relationship to sides will show one of the basic forms.

e.g. Cubic or Isometric System

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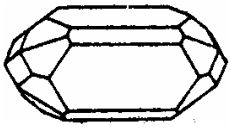
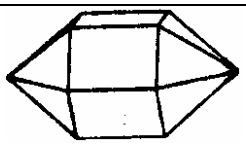
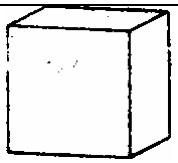
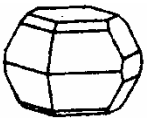
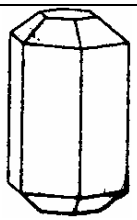
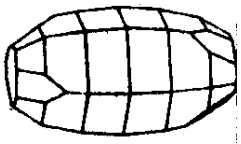
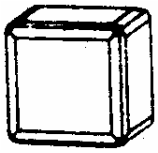
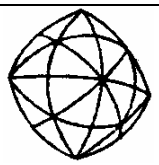
Part II.

1. Using the illustrations of some crystal forms in the table below, record the number of sides and the geometric shape of the faces of the samples pictured. Use your imagination for the third dimension.
2. Write the name of the crystal model most like the mineral sample pictured.

Mineral	Model Name or System	# of Faces	Geometric Shape of Face	Mineral	Model Name or System	# of Faces	Geometric Shape of Face
 Zircon				 Quartz			
 Halite				 Sulfur			
 Apatite				 Corundum			
 Fluorite				 Diamond			

Analysis/Conclusion Questions

1. Do all crystals look alike?
2. What causes mineral crystals to have definite patterns?
3. What is the most frequent geometric shape found on the crystal models provided?
4. Crystal models are similar in what ways? Different is what ways?
5. Which of the mineral samples are used in jewelry?
6. Does the crystal system have any relationship to hardness?
   Look up the hardness of mineral samples on Mohs' Hardness scale or test samples given for their hardness.