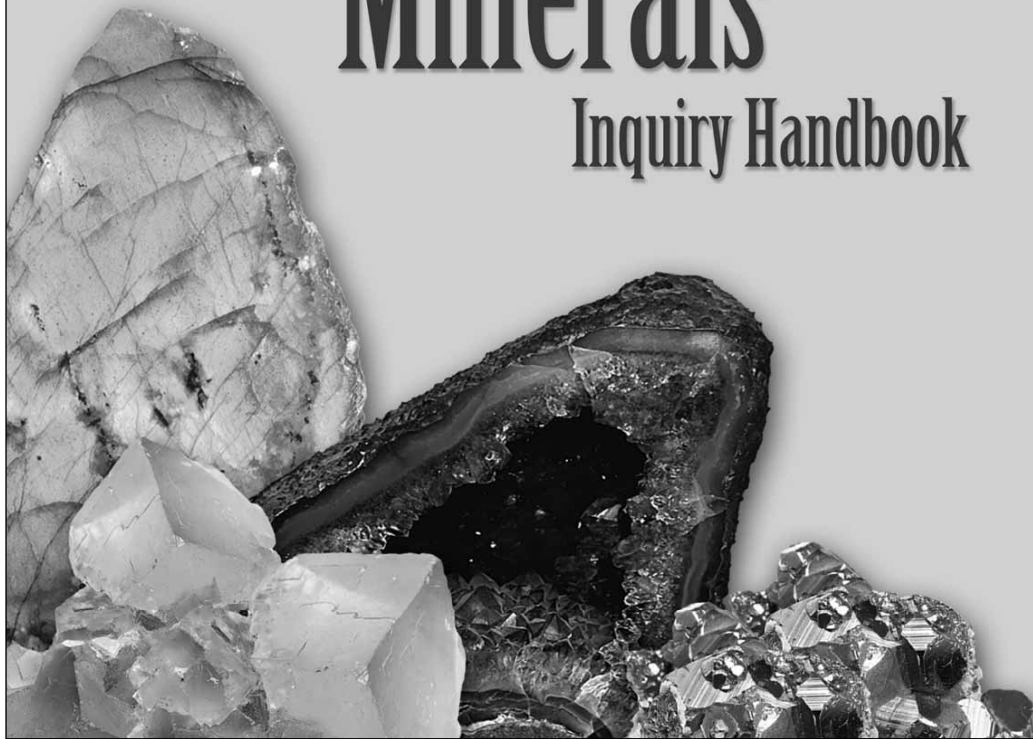


DISCOVERING
SCIENCE
through
INQUIRY

Rocks and Minerals

Inquiry Handbook



Author

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Teacher Created Materials

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Name _____

Crystals

What Factors Affect Crystal Growth?

Directions: Choose one of the Questions for Investigation below. Use the question you chose to formulate a hypothesis. Then, design an experiment using the materials your teacher has provided to test your hypothesis. Make observations and draw a conclusion. Create a record of your experiment on a separate sheet of paper.

Questions for Investigation

- Do crystals grow more on rocks or metal?
- Do crystals grow more on smooth or rough objects?
- Does temperature affect the rate of growth or the size of the crystals?



Question

Select one of the Questions for Investigation. Write the question you chose.



Hypothesis

Formulate and record your hypothesis.



Experimental Design

Design and conduct your experiment similar to the demonstration with crystals that your teacher did with the whole class. Write the steps of your experiment. **Reminder:** You will need a control group and a test group. Change only one variable, such as the temperature, for the test group.



Observation

What happened in your experiment? Record your observations.

	Appearance			
	Start	3 hours	24 hours	48 hours
Control Group				
Test Group				



Conclusion

What is the answer to your question? Write your conclusion. Do your findings support your hypothesis? What did you learn from this experiment?

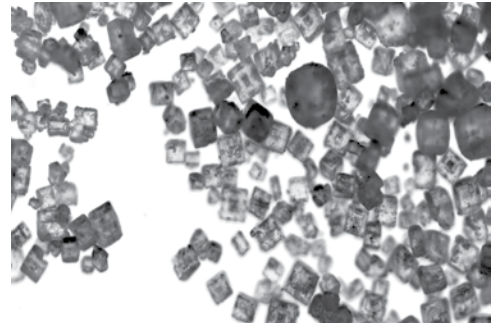
Crystals

The Story of Crystals

What Are Crystals?

The word crystal comes from the Greek word *krystallos*. It means *icy cold*. That is because the Greeks thought that crystals came from water. They thought the water was frozen solid and would not melt.

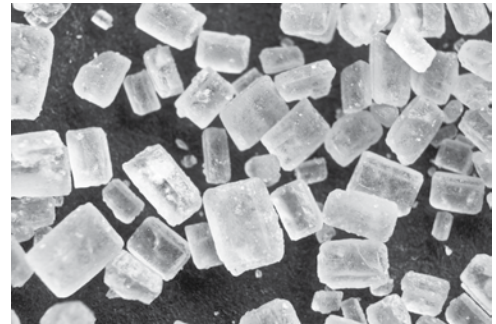
Today, we know that crystals are solids. They are made of atoms arranged in a specific ordered pattern. Crystals are the building blocks for minerals. Minerals are made up of crystals. *Crystallization* is the process that creates crystals. Scientists who study crystals are called *crystallographers* (crys-tal-LOG-ra-phers).



salt crystals

How Do Crystals Get Their Shape?

Crystals can be six different shapes. These shapes are called *crystal systems*. The shape depends on how the atoms are connected. Atoms connect in certain ways. Look at a salt crystal with a hand lens. You will see that salt crystals are in the shape of a cube. Sugar crystals are oblong and rougher at the ends.



sugar crystals

There are other kinds of crystals. Snowflakes are water crystals. Many gemstones are formed from crystals. Silicon crystals are in solar panels. They change sunlight into energy we can use. Tiny crystals are used in some electronics. Quartz crystals are used for lenses found in telescopes and digital watches.

The Size of Crystals

Crystals come in all sizes. Some crystals are very large and can be seen easily, but some can only be seen with special microscopes. In the Cave of the Crystals in Naica, Mexico, workers found some of the largest crystals ever seen. One of them is 11 meters (36 feet) long and 1.2 meters (4 feet) wide! Those crystals formed thousands of years ago.



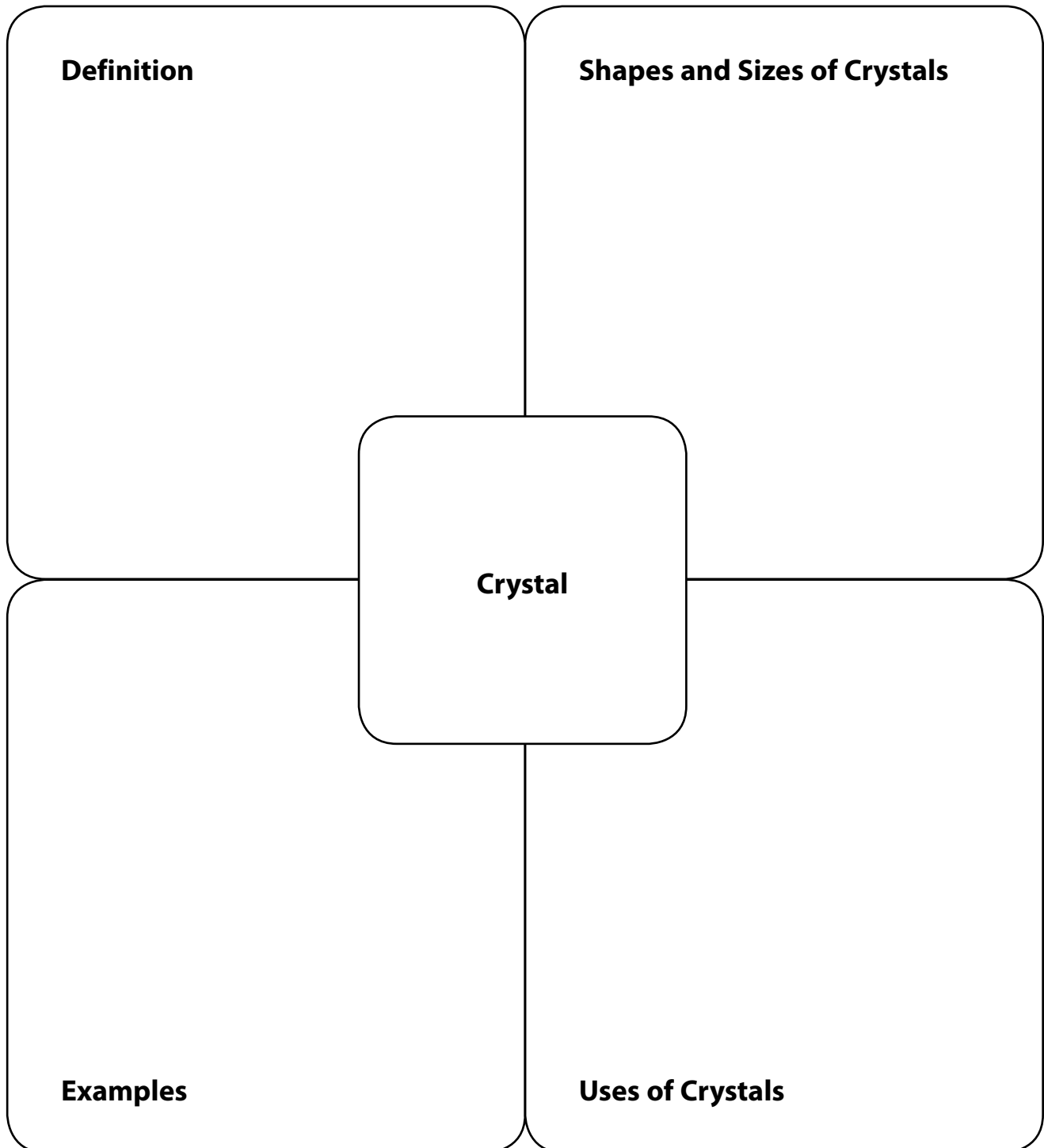
crystals in Naica, Mexico

Name _____

Crystals

Mapping Crystals

Directions: Think about the information you read on the previous page and complete the concept map below.



Crystals

Crystals Vocabulary

Directions: Write the vocabulary word or phrase next to its definition. Choose words from the Word Box below.

Word Box
 crystal crystallization crystallographer crystal system

Vocabulary Word	Definition
1.	any of the six main classifications of crystals according to their geometric shapes
2.	the process of crystal formation
3.	a geometric, solid material with flat surfaces that forms in an orderly, repeating pattern
4.	a scientist who studies the forms and structure of crystals

Directions: Illustrate each term in the spaces below.

crystal	crystallization
crystallographer	crystal system

Crystals

Crystal Systems: The Shape of Crystals

