

Experimenting with Crystal Formation

Experiment Activity

Materials (per group)

alum potassium sulfate

3 plastic cup, 9 oz

3 plastic medicine cups , 1 oz

plastic wrap

thread

3 buttons

safety goggles

metric ruler

masking tape

ice water

room temperature water

warm water

pencils

Advance Prep

- Prepare alum solution immediately prior to the activity. Mix one part alum and two parts water in a pan over a burner or in very warm water. Stir until completely dissolved. When dissolved, the solution will be clear. Allow the solution to cool until it is warm to the touch but not hot enough to cause burns.
- Prepare the ice water and room temperature water before beginning the activity.

Hints and Tips

Remind students not to bump or move the containers with the cups. Movement will disturb crystal growth.

Safety Note

- Remind students not to touch very warm solution, and not to drink any of the solution.
- Have students wipe up any spills immediately.

Activity Rubrics

Scoring Key

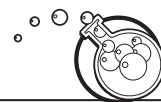
4 correct, complete, detailed

3 partially correct, complete, detailed

2 partially correct, partially complete, lacks some detail

1 incorrect or incomplete, needs assistance

Experiment Activity Experimenting with Crystal Formation																						
Scoring Criteria																						
Student made a hypothesis about the effect the rate of cooling has on size of crystals that form.																						
Student followed instructions to perform an experiment on crystal formation.																						
Student identified and controlled variables.																						
Student collected and interpreted data by observing and by measuring and recording the size of the crystals.																						
Student communicated by stating conclusion about effect of rate of cooling on crystal size.																						
Score	total points																					
	% equivalent																					



Experimenting with Crystal Formation

State the Problem

How does the rate of cooling affect crystal size?

Formulate Your Hypothesis

When cooling is faster will the size of alum crystals be larger, smaller, or will there be no effect?

Identify and Control the Variables

The rate of cooling the alum solution is the **variable** you can change. Keep the concentration of the solution and the amount of solution the same for each trial.

Test Your Hypothesis

Record your data in the chart below.

Collect Your Data

Observations and measurements of crystals						
Cup	15 min.	30 min.	1 hour	2 hours	4 hours	Measurements
A						
B						
C						

Interpret Your Data

1. In which cup did crystals form the fastest? the slowest?

Name _____ Date _____

2. In which cup did the smallest crystals form? In which cup did the largest crystals form?

3. Describe how the rate of cooling affects crystal size.

State Your Conclusion

How did your results compare with your hypothesis? Write a summary of how the rate of cooling affects crystal size.

Inquire Further

What will happen if you keep the buttons in the solution until the solution evaporates? Develop a plan to answer this or other questions you may have.

Self-Assessment Checklist

I made a **hypothesis** about the effect the rate of cooling has on the size of crystals that form.

I **identified** and **controlled variables**.

I followed instructions to perform an **experiment** to **observe** crystal formation.

I **collected** and **interpreted data** by **recording observations** and by **measuring** and recording the size of the crystals.

I **communicated** by stating my conclusion about the effect of the rate of cooling on crystal size.



Notes for Home Your child **experimented** to see the effect the rate of cooling has on the size of crystals formed.

Home Activity: Ask your child to explain the results of the experiment to you.