Gold Seal Lesson:

Copernicus Education Gateway

Author(s): Gail M.Venezio			***Lesson Title: ROCK CANDY***			
Grade Span			***ICLE Application Model***			
K-4	***5-8***	***9-12***	***A***	***B***	***C***	***D***
X						***X***

Instructional Focus:

Listening:
Students listen for a variety of purposes appropriate to the grade level.

Tools and Technology:
Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Basic Concepts and Knowledge:
Students develop an understanding of scientific concepts using facts, theories, principles, and models.

Science and Inquiry:
Students demonstrate knowledge and skills necessary to perform scientific inquiry.

Performance Task

- Using Black Construction paper have students observe sugar and salt crystals.
- Have students use student recording sheet to observe, draw, and predict what kind of crystals they might be.
- Describe to students that we will use sugar and water and dissolve them to make a mixture. Students will need to understand concept of a mixture.

  A mixture is when 2 objects are added and stirred until they appear as one. When something dissolves we will no longer see water and sugar, but rather one solution.
- Make rock candy mixture, a super-saturated solution of sugar water. Follow the directions for making rock candy crystals.
- Observe other rock crystals either by graphic or actual rock sample.
- Have students observe snow crystals, if possible. I take students outside with magnifying glass and hand lens.

Describe to other teachers that any time snow is falling from sky, it's an excellent opportunity to go out and observe the snow on construction paper with a hand lens, even if they are not studying crystals. They can transfer this learning later, and is an excellent opportunity to explore! Don't miss a great opportunity.

- Recipe for quick, no-wait crystals: use alum or baking soda and make a super-saturated solution.

Teacher Background Information:
When molecules or atoms of a substance line up in an organized, repeating pattern, that substance is a crystal. Different conditions allow crystals to grow. Diamonds grow from heat and pressure. Evaporation helps our rock candy crystals grow.
Different crystal shapes: isometric, triclinic, hexagonal, orthorhombic, monoclinic, tetragonal.

ICLE Essential Skills

Know and apply the principles of scientific inquiry. *(Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.) (s114 Not Ranked)*
Make observations using senses and instruments. Inferences and interpretations are arrived at based on observations. Classify observable properties and organize observations in a meaningful and logical way. (s5)
Know the processes involved in the water cycle, (i.e., evaporation, condensation, precipitation, surface runoff, percolation) and their effects on climate patterns. (s7)
Understand physical/chemical change (e.g., change of phase between gases, liquids, and solids). (s57)
Know how to classify matter as a substance or mixture. (s69)
Understand the ***properties and classification of polygons*** (e.g., triangle, quadrilaterals, pentagon, hexagon, etc.) as well as knowledge of geometric shapes. (m26)

Scoring Guide:

Rate each of the following characteristic on a 3-0 basis, where
3=Excellent quality
2= Satisfactory quality
1=Unsatisfactory quality
0=Does not attempt or does not show skill/knowledge

Characteristic	**Score**
Students will use hand lens to observe crystals.	_____
Students will be able to describe some examples of mixtures.	_____
Students will be able to describe some examples of physical changes in nature.	_____
Students will compare and contrast two different crystals.	_____

Keywords

English Language Arts	Mathematics	Science
Reading	**Algebra**	**Earth Science** Earth minerals Geology Rocks,
Writing	**Geometry** Angles Geometric shapes Parallel lines Polygons Pyramids Quadrilaterals	**Life Science**
Communications	**Statistics**	**Chemistry** Heating and Cooling Mixtures Molecular bonds
Literature	**Calculus**	**Physics** Physical Properties Temperature
Other	**Trigonometry**	**Other**
	Other	

If you have a Picture, Chart, or Graph that has special formatting, please identify the name of the file(s) in box below. Also attach a copy of the file(s) with this disk.

Picture, Chart, or Graph file name(s):

Directions for Making Rock Candy Crystals

1. Heat water until it is very hot.
2. Add a few drops of food color.
3. Pour sugar into the hot water and stir until sugar is completely dissolved.
4. Take the pan off the stove and let the mixture cool for 15 minutes.
5. Tie one end of a short length of string to a paperclip and the other to the middle of a pencil. Place the pencil over a jar so that it supporting the paperclip hanging near the bottom of the jar.
6. Pour the mixture into jar.
7. Place the jar in a location where it can be seen easily, but will not be disturbed.

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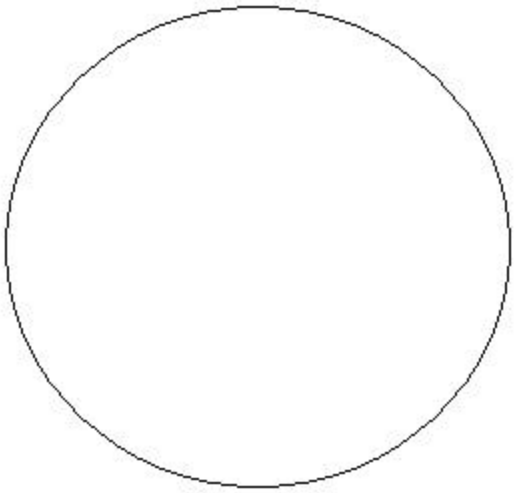
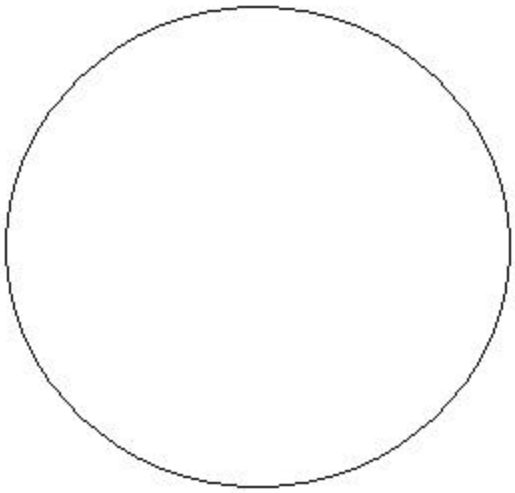
Name_____

Observing Crystals

Sprinkle crystal #1 on paper. Observe and Draw.



Sprinkle crystal #2 on paper. Observe and draw.



I predict crystal #1 is a _____crystal.

I predict crystal # 2 is a _____crystal.