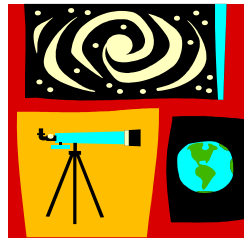




Demo Space Freeze II: Cryogenics

Post-Visit Activities Grades 3-5



Developed 12/06

600 Settlers Landing Road • Hampton, Virginia 23669-4033 • (757)
727-0900 • www.vasc.org

These activities are intended for use after your visit to the Virginia Air and Space Center. Your students should recall the information, demonstration, and activities from the Space Freeze demonstration in order to do these activities. All of the activities can be tailored to your specific classroom needs, and the procedures listed are suggestions for teaching.

Activity 1: Scientific Method

There are several different ways you can do this activity. Choose 2 or 3 of the different experiments that your students conducted at the center and have them analyze each one. You can take whatever approach you think is best for your class: (a.) Create your own work sheet with a list of questions pertaining to what they learned, and have your students fill in the answers. (b.) Let your students take turns writing the information on the board as you discuss it. (c.) Break up into groups, and give each group a different experiment to analyze.

For each experiment, have your students answer the following questions: What was the observation, what were they asked to question, what were their

hypotheses, what was the experiment, and what was the conclusion? Have them think about each step in the experiments.

Extension: You can take this activity a step farther by having your students label what each of the variables were in each experiment.

Activity 2: Solids, Liquids, and Gases

Using the three states of matter, have your class label and or identify the following clues or questions:

1. What state of matter takes on the shape of its container? Answer: liquid
2. What state of matter is formed when you heat it up? Answer: gas
3. What state of matter retains a fixed volume and rigid shape? Answer: solid
4. What state of matter has particles that vibrate, move about, and slide past each other? Answer: liquid and gas
5. What state of matter has no shape, size or color of its own? Answer: gas
6. What state of matter is formed when you drop the temperature down (cold)? Answer: solid
7. What state of matter has particles that vibrate and move freely at high speeds? Answer: gas
8. What state of matter has particles that are locked in place? Answer: solid

Review the experiments that your students observed at the center. How did the properties of each different item change after it was placed in the liquid nitrogen?

Extension- Have your students come up with other materials that we use everyday that have to be tested for temperature changes. For example: When painting a car couldn't you just use markers? No. Then ask why? Have them think about all the different things that they use every day that have to be tested by scientists and engineers, everything from make-up to soccer balls.

Resources

WEBSITES

http://www.chem4kids.com/flies/matter_intro.html

http://www.cosmos4kids.com/flies/universe_vacuum.html

http://www.biology4kids.com/flies/studies_scimethod.html

<http://www.pbs.org/teachersource/>

http://www.kidsastronomy.com/explore_index.htm

http://www.kids.gov/k_space.htm

<http://idahoptv.org/dialogue4kids/season7/matter/facts.html>

<http://teacher.scholastic.com/space/tguide.htm>

<http://www.astronautix.com>

BOOKS

Living in Space. Don Berliner. 1993.

The Magic School Bus Lost in the Solar System. Joanna Cole. 1990.

Space Station Science: Life in Free Fall. Marianne Dyson. 1999.

Space Stations. Roy A. Gallant. 2001.

Space Shuttles. Gregory L. Vogt. 1999.

What's the Matter in Mr. Whisker's Room? Michael Ross. 2004.

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