

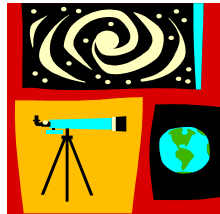


Demo

Space Freeze I: Cryogenics

Post-Visit Activities

Grades K-2



Developed 11/06

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: A Change of Properties

Prep- For this activity you will need a big open space that your whole class can move around in.

Have your class spread out about an arm's length away from each other. Tell them that you are going to use them in an experiment to show how water changes from solid-to-liquid-to-gas. Explain that each one of them represents a different water molecule. Prompt each student to slowly turn around in place. Explain to them that as they turn, they represent water in liquid form at room temperature (approximately 72 degrees Fahrenheit).

Ask them, "What would happen if I put all of you "water molecules" in a freezer?" You will turn to ice. "So how can we, as water molecules, represent ice?" Have all the students stand really close together so that no one is able to

turn around anymore. Ask them to recall the balloon that was placed in liquid nitrogen in the demo. Explain that just like the air molecules in the balloon, water molecules condense together in cold temperatures. Water freezes at 32 degrees Fahrenheit. The extreme cold causes the water molecules to condense down, really close together, making it impossible to move around anymore. Water properties changed from liquid to solid by dropping the temperature. "So now let's unfreeze ourselves back to room temperature." Have the students spread back out.

Ask the students, "How can water in liquid form change into a gas?" Have your students think about the question for a second. Ask them to recall what the liquid nitrogen did when placed in the tea kettle. The steam boiling off of the liquid nitrogen caused the whistle to blow. Explain that to change water from a liquid form to a gas form, you raise the temperature. Water boils off into a gas form at 212 degrees Fahrenheit. Have the class start to move all around. They represent water molecules in gas form. The increase in temperature causes the water molecules to bounce off one another.

Extension: Turn this concept into a game they can play outside at recess. Make it similar to 'Simon Says' but only use the following commands: Liquid, Solid, Gas.

Activity 2: Experiment Safety

Prep- You will need a poster board and markers for this activity.

Have your class put together their own list of safety guidelines to follow when doing an experiment. Have them recall and analyze some of the things they learned. What kind of safety procedures did they follow when working with the liquid nitrogen? Did different experiments require different safety gear or materials? If the answer is yes, then ask them "why?" Have your students discuss all of these questions. After your class has made up their own list, write it on the poster board and hang it up in your class.

Extension: You can take this idea a step further by teaching your class about the scientific method. Have them label the experiments done at the center by identifying the following: What did they observe, what were they asked to question, what was the hypothesis, what was the experiment, and what was the conclusion?

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

<http://www.astronautix.com>

BOOKS

IT'S SCIENCE SOLID, LIQUID, OR GASES? Sally Hewitt. 1997.

Solids, Liquids, and Gases. Ginger Garrett. 2004.

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

This document was created with Win2PDF available at <http://www.daneprairie.com>.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.