
	Building Blocks Alan Quimby Harrisonburg City Public Schools	
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Topic: Science, matter, atoms, molecules

Overview

This lesson will provide students with the opportunity to explore and learn about atoms and molecules, the building blocks of matter. Students will observe ice melting, and view a video that gives information about the phases of matter. Students will create a writing assignment from the perspective of an ice cube.

Grade 5

Time Allotment

One 50-minute period

Learning Objectives

On completion of this lesson students will be able to:

- Identify a solid, liquid, and gas.
- Explain the process of changing phases (states) of matter.
- Explain the role of energy (heat) in the process.

This lesson addresses Va. SOL Science 5.4a, 5.4c

Media Components

- Videostreaming: Matter: Building Blocks of the Universe. Rainbow Educational Media. 1987. 8 December 2005. <http://wvpt.unitedstreaming.com/>.
 Segment 6: Phases of Matter: Solid, Liquid, & Gas (02:09)
 Segment y: Phase Changes in Matter: Adding or Subtracting Heat (02:55)
- Computer with Internet access
- Multimedia projector

Materials and Student Handouts

- Phases of Matter handout-one per student (attached)
- Writing assignment and rubric-one per student (attached)
- One ice cube
- Small cooler
- Clear container
- Overhead Projector (optional)

Teacher Preparations

- Download and preview the video clips.
- Duplicate the handout and rubric for each student.
- Have the ice cube in the room in a cooler.

Introductory Activity

1. **Focus:** What do I have in this container? (ice) What is it made out of? (water) Why is it like this? (frozen, solid) What do you think will happen when I leave this cup sitting out in the room? (melt) Let's try it.

Activity: Let the ice cube sit in the container for a few minutes. (Optional: Put the container on the overhead to speed up the process.) After you can see water in the bottom of the container show the students what has happened to the ice cube.

Follow-up: What is happening? (melting) Melting is what occurs when a solid turns into a liquid. Today we are going to learn a little about the different phases of matter, and how matter can change from one to another.

Learning Activities

1. **Focus:** I am giving you a worksheet called Phases of Matter to fill in as we watch the video clips. In the first clip, I want you to watch and listen to see how the shapes of solids, liquids, and gases are different from each other.

Play: the video clip Phases of Matter: Solid, Liquid, and Gas (02:09) in its entirety.

Stop: at the end.

Follow-up: Write your responses down on the handout if you have not already done so. (Have the students share their answers with the rest of the class. Answers should include: solids have a definite shape, liquids take the shape of their container, and gases spread to fill a container completely.)

2. **Focus:** In the second clip, watch and listen for how heat energy affects a solid.

Play: the video clip Phase Changes in Matter: Adding or Subtracting Heat (02:55) in its entirety.

Follow-up: Write your responses down on the handout if you have not already done so. (Have students share their answers with the rest of the class. Answers should include: Heat adds energy to the molecules, heat energy causes molecules to move faster, water changes from solid to liquid at its melting point, and water changes from a liquid to a gas at its boiling point.)

Culminating Activities

1. **Focus:** Now you are going to do a writing activity about Joe the ice cube. I'm going to give you a handout with the assignment and an explanation of how I am going to assess the assignment. (Give out the assignment and rubric.)

Activity: Have the students look at the writing activity that is written on the student handout. Give out the grading rubric and go over the assignment with the students.

Allow time for students to write their papers. Give sufficient time for students to follow all the steps in the writing process in order to fulfill the rubric requirements.

Follow-up: Students should be encouraged to share their writing with the class.

Assessment

- Use the attached rubric to assess the writing assignment
- Grade the student handout as a classwork grade



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Community Connections

- Invite the school custodian to explain to the class why salt or commercial ice melt is spread on the sidewalks on a snowy day.
- Invite a city or county worker to discuss the process of spreading salt on city or county streets.

Cross-Curricular Extensions

- Technology simulation website located at:
http://www.harcourtschool.com/activity/states_of_matter/

About the Author

Alan Quimby is a fifth grade teacher at Stone Spring Elementary School in Harrisonburg, Virginia.

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Phases of Matter

Name - _____

Video Clip #1

Focus: How are the shapes of solids, liquids, and gases different from each other?

1. A solid has a _____ shape.
2. A liquid takes the shape of its _____.
3. A gas _____ to evenly fill a space or container.

Video Clip #2

Focus: How does heat energy affect a solid?

_____ adds energy to the molecules in a substance.

The heat energy causes the molecules to move _____.

As the temperature of a solid reaches its _____ point, the molecules change from solid to liquid.

As the temperature of the liquid reaches its _____ point, the molecules change from liquid to gas.

Writing Assignment Rubric

Name - _____

Write a story about Joe the ice cube. Joe is an ice cube who lives in the principal's freezer. Write about what happens to Joe when he is taken out of the freezer and left in a container on the counter. After several minutes Joe is put into a pan on the stove. Write about what happens to Joe as the heat is turned on.

Elements of the Assignment	Points Possible	Points Earned
Student includes all of the parts of the story	5	
Student uses the terms solid liquid and gas correctly and appropriately	10	
Student uses the terms melting, and boiling correctly and appropriately	10	
Student uses good voice in writing	5	
Student uses correct grammatical structure	10	
Student uses correct spelling	10	
Student work is neat and legible	5	
Student work is turned in on time	5	
Total	60	