

Title - *Changes of State of Matter*

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Subject - Science

Grade Level - Grade 3 - 5

1 hour

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I. Rationale and Background

The students have been introduced to a unit involving States of Matter. In order to have a more in depth understanding of the states of matter, they need to know how matter changes, and what causes matter to change. In the students' daily lives, they encounter a variety of matter in the different states. This lesson will allow them to conceptualize these common occurrences in their daily lives.

II. Objectives

The students will be able to classify the changes of state matter undergoes when given a description of the shape and volume.

The students will be able to describe the change of state matter undergoes when given the name.

The students will be able to identify examples of each change of state when given either a description or the name of a change of state.

III. Resources and Materials

Computer lab

One computer per student

projector

projector screen

Regular classroom may be substituted using chalk and board)

IV. Concepts

Changes of state of matter: melting, evaporation, condensation, freezing, sublimation, deposition.

VI. Procedures:

A. Introduction and motivation:

Teacher: Alright, class. As you can see, we will be working with the computers today. Please observe the appropriate rules of conduct when using the computers. I would like everyone to turn on the computers and type in the following URL <http://www.iup.edu/~cxzmvxa/>. Click on the cell marked "Lesson Plan," and then click on "Notes." Teacher should display the notes on a screen as well.

Please note, the Notes are also included in the Student Notes section below.

Follow along with me by reading the screen in the front of the room. There will be a point during the lesson at which you may use the computer. When the time comes, I will tell you. Until then, please pay attention to the front of the room.

B. Lesson Body

(The teacher will pull up the "Notes" section of the lesson at this time, and will teach the lesson according to the notes. The notes include a review of States of Matter, followed by material on Changes of State of Matter.) A Powerpoint presentation could now be given over the material.

C. Closure

(The students can use class time to review what they have learned so far by accessing the above internet site. Located on the Lesson Plan Page is a cell marked, "Related Activities and Websites." The students may take the Unit Test Practice Exam on States of Matter, located in the cell below "Related Activities and Websites."

V. Evaluation

A. Student Assessment

Evaluation of the students will be determined by a quiz. The students will take the quiz on the computer and will be required to print out a copy of the results. Any student who has trouble with either use of the computer or learning the material will have a chance to return to the computer lab during free time or after school. The teacher will be available at that time.

B. Reflection on Assessment of Student Performance:

Did all the students actively participate in exploration of "Matter" using computer medium?
Did all the students complete the quiz and print a copy for the teacher?

C. Self Evaluation:

- 1.
- 2.
- 3.

Student Notes Section:

REVIEW: Matter - anything that has mass and takes up space

States of Matter: solid, liquid, gas, plasma

Solid - has definite shape, definite volume (ex. Rock)

Liquid - has indefinite shape, definite volume (ex. water)

Gas - has indefinite shape, indefinite volume (ex. air)

PHASES!

CHANGES OF STATE OF MATTER:

- * When something such as water turns from being water to being ice, it is called a change of state.
- * There are different changes that can take place.
- * Water, for example, can change from water to ice, which is called freezing. Freezing is what happens when a liquid changes to a solid.
- * Water can change from ice to water, which is called melting. Melting is what happens when a solid changes to a liquid.
- * Water can also change from a water to steam, which is called evaporation. Evaporation is what happens when a liquid changes to a gas.
- * Water can change from steam back to water, which is called condensation. Condensation occurs when gas changes into a liquid.
- * There are some substances which can go from being a solid, directly to the gas state, which is called sublimation. Solid carbon dioxide, commonly known as Dry Ice, bypasses the liquid state altogether when it changes to a gas.
- * The last change of state is matter going from a gas, directly to the solid state, which is called deposition. Water vapors in the air during winter fall in the form of snow, a solid.

CAUSE OF CHANGES:

- * Energy. Energy is either lost or gained during a change of state.
- * When energy is applied to a solid, the tightly packed particles of matter begin to move around, flowing over each other. The result is the movement of liquid. The shape becomes indefinite. The volume, however, does not change, because the particles are still part of one another.
- * When energy is applied to a liquid, the particles that make up a liquid, begin to move about so rapidly, that they can no longer hold themselves together. The result is the movement of a gas. The shape is indefinite, and the volume becomes indefinite.
- * The reverse happens to gas when energy is taken away. Water vapor, for example begins to liquify as it cools. Remember the cool mornings when fog is dense and close to the ground? What happens? Dewdrops form. The water vapors in the air cool to form liquid drops on grass.
- * When energy is taken away from liquid, the particles in the liquid slow down to low movement. The resulting solid, has definite shape and definite volume.

REVIEW what you have learned by reading more about the States of Matter.

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