

Properties of Matter

Second Grade

Activity: 6

Time: 1 Class Period

General Description

Students need to understand that matter is everywhere and it takes different forms. Water can be seen as a liquid, solid or gas. Students are exposed to matter in all that they see and touch. There is matter even in the things we don't typically think of as touching, for example, air. It is also important that students understand that all matter takes up space and has a mass.

Objectives

Students will identify objects as a solid, liquid, or gas.

Students will use descriptive language to help identify objects as a solid, liquid or gas.

Students will provide evidence to support their answer when asked if something is a solid, liquid or gas.

Arizona State Standards

SC02 S1C2 PO1 Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry

SC02 S1C2 PO4 Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper)

SC02 S1C2 PO3 Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units)

SC02 S1C4 PO1 Communicate the results and conclusions of an investigation (e.g., verbal, drawn, or written)

SC02 S5C1 PO2 Classify materials as solids, liquids, or gases

SC02 S5C1 PO3 Demonstrate that water can exist as a:

- gas – vapor
- liquid – water
- solid – ice

SC02 S5C1 PO4 Demonstrate that solids have a definite shape and that liquid and gases take the shape of their containers

W02 S3C2 PO1 Write expository texts (e.g., labels, lists, observations, journals)

R02 S3C2 PO1 Follow a set of written multi-step directions

M02 S2C2 PO1 Formulate questions to collect data in contextual situations

M02 S2C2 PO2 Make a simple pictograph or tally chart with appropriate labels from organized data

Teacher Background

Matter exists in different states- solid, liquid, and gas. A common example of all three states of matter is water which can be changed from one state to another by heating or cooling. Giving students the opportunity to explore and investigate the different states helps them develop their own understanding.

Materials

Toy truck
Magnets
Block of wood
Rock
Ice cubes
Hot plate
Balances
Yard stick
Balloons
Construction paper
Saucepan
Water
Vegetable oil
Juice
Lotion
Ziploc bag
Aerosol can with air
Measuring cups of different styles
Clear plastic containers of different sizes and shapes

Procedure/Exploration

1. Provide students with a piece of paper of what they think will happen when you put an ice cube in a saucepan on a hot plate and turn the heat on. (Students can either use words or drawings in their predictions.)
2. Place the ice in the pan and turn up the heat. Allow it to melt and then boil so that students get the experience of melting to water and boiling to steam. (You may want to use more than one ice cube.)
3. Give the students time to draw what actually happened on the other side of the paper.
4. Create stations in the room; solids, liquids and gas. At each station place the following
Solid: toy truck, magnets, block of wood, rock
containers that the students can use to put the objects in.
Liquid: water, vegetable oil, juice, lotion,
several containers students can put the liquids into.
measuring cups of different styles will help students see that the volume does not change
Gas: balloons
Ziploc bag
aerosol can with air
5. At each station the students will look at the objects and use descriptive words to tell about the objects in each group. Ask them to use the containers and see what happens when they put the objects into different containers (include-color, size, shape, texture, etc.).
6. After students explore each station have them share their thoughts and ideas.
7. Using the items from the solid table help the students see that solids take up space and have a definite shape. The toy truck will not change shape no matter what container we put it in.

8. Using the items from the liquid table help the students see that liquids take up space and will take the shape of the container they are in and have a definite volume. The water will take the shape of the container but the amount of water does not change from container to container.
9. Using the items from the gas table help the students see that gases take up space and have take the shape of the container they are in and does have mass. Take a yard stick/meter stick and tie a blown up balloon to each end of the stick. Balance the stick so that it is level and then place a tiny hole in one balloon. As the balloon deflates the volume is reduced and the stick will become unbalanced. This will demonstrate to students that gas does have mass.
10. Have the students correct their definitions/drawings of the states of matter.
11. Assess the students by giving them objects and having them tell you if they are solid, liquids, or gases.