



Matter I

CONTENT TOPIC: Matter I – States of Matter

CONCEPT: Solids, liquids, and gases have identifying properties.

OBJECTIVE: To understand the properties of the three states of matter

INSTRUCTIONAL OBJECTIVES: The learner will:

- identify properties of materials as they undergo physical changes, such as size, form, shape, heated, expanded, cooled, or contracted.
- identify the three states of matter.

Experiment 1 – Matter I

TIME REQUIRED: 30 minutes

MATERIALS:

Examples of solids, liquids, and gasses, balloons, baking soda, vinegar, clear beaker of water, tablespoon, large mixing bowl, water, green food coloring, and glue, measurement thermometer, styrofoam cups, ice cubes, boiling water

SET:

Matter can be put into 3 groups: a solid, liquid, or gas. By adding energy (heat in this case) we can change the “states” of matter. Define the “states” for them on the board. Show the atoms and their relative energy levels by using the kids. All matter has energy and we can use energy to force a change of state.

(Show ordinary solids that are found in your classroom. Examples books, paper, pencils, desks, chalkboards, etc.) Solids are particles of matter which have closely packed particles called atoms. The atoms in solids vibrate against each other but they never change places. This is why the shape of solids remains the same. The shape of solids do not change; however, you can change them. (Teacher could cut, wad, fold or tear paper to demonstrate change.) By adding energy (heat in this case) we can change the states of matter.

Show examples of liquids. The atoms move more in liquids than in solids. Liquids therefore take the shape of their container. (Pour the same amount of liquid into different containers.)

The atoms in gases have the most movement. That is why they are harder to see. The atoms collide and spread out to fill the container.

ACTIVE PARTICIPATION: Let's become atoms in solids, liquids, and gases. Show what happens when heat energy is added to the matter.

1. **SOLIDS** – Take a small group of children, place them close to each other and rub your hands back and forth.
2. **LIQUIDS** – Take a small group of children spread out a bit and have them wave their arms.
3. **GASES** - Let a group of children walk around room bumping into each other and then spreading out in all directions.

Show that the atoms move more (gain energy) by the addition of heat energy. Have the students change to the next “state” by having solids change to liquids and liquids change to gas.

Draw circles to show how close atoms are in the different states of matter. In the solids they are close together. In liquids they are further apart and in gases they are even further apart. (Teacher should model this on the board.)

SET 2:

Matter can be put into 3 groups. What are the 3 states of matter? Matter can be a solid, liquid, or gas. Give each student team examples of different matter to explore: ice, dry ice, water, oil, clay, steel wool, wood, etc...

ACTIVE PARTICIPATION:

"Get Slimed" Activity

Materials: tablespoon, bowl, Elmers glue, liquid starch, green food coloring

1. Put 3 level tablespoons of glue into a bowl.
2. Add 3 tablespoons of liquid starch and a drop of food coloring. Mix the slime with your hands.
3. Scoop up a handful. Does it run like a liquid? Quickly press it into a ball. Is it hard like a solid? It is a liquid and a solid. It is a mixture called a **COLLOIDAL SUSPENSION** (coe-LOYD-uhl suh SPEN-shun). The tiny bits of cornstarch stay suspended (floating) in the water instead of settling to the bottom. Milk, blood, and mud are other examples.
4. All "slimed out"? Toss it in the trash, not the sink.

CLOSURE:



Next time we are going to look at changes in states. Energy can change matter into different states. The normal progression of change for matter is Solid \leftrightarrow Liquid \leftrightarrow Gas.

- 1) What are the 3 states of matter?
- 2) How can we change states of matter?
- 3) Can a different type of energy (other than heat) affect matter? How?
- 4) Draw what you think happens to atoms in a liquid if we add cold energy?