

What Is The Matter ? Matter Concept Map

		Phases of Matter	
<u>Solid</u>		<u>Liquid</u>	<u>Gas</u>

Use the selections below to complete the concept map for the phases of matter. Write the letter of each characteristic in the appropriate column.

- A. Definite Shape
- B. No Shape
- C. Takes shape of container

- D. Definite Volume
- E. No Volume
- F. Definite Volume

- G. Free flowing particles
- H. Very slow moving, vibrating particles

- I. High speed particles, moving in all directions

Teacher Assessment Guide For The Concept Map

Solid = A, D or F, and H
 Liquid = C, D or F, and G
 Gas = B, E, and I

What Is The Matter? Student Lab Investigation

Question: Can the physical state of matter be identified as a solid, liquid, or a gas?

Background Information:

A *solid* has a definite shape and a definite volume. The particles of a solid are tightly packed and move slightly back and forth in a vibrating motion.

A *liquid* has no shape of its own. It takes the shape of its container. The particles in a liquid are fairly close but are able to flow freely around one another.

A *gas* has neither definite shape nor volume. Its particles spread apart filling the space available to them. The particles in a gas move at high speeds in all directions.

Hypothesis: The physical properties of matter can / cannot be identified as a solid, liquid, or gas.

Materials: Eight different samples of matter

Procedure:

1. Begin at your designated lab station.
2. Observe the matter and determine if the matter is a solid, liquid, or a gas based upon the background information.
3. Log your findings on the data chart.
4. Rotate to the next station when the teacher calls time.
5. Repeat the process for all eight stations.

Data Chart

Lab Station Number	Phase of Matter Solid, Liquid, or Gas	Definite Shape? Yes or No	Definite Volume? Yes or No	Slow, free flowing, or high speed particles?
1				
2				
3				
4				
5				
6				
7				
8				

Conclusion: The physical state of matter can / cannot be identified as a solid, liquid, or a gas.

Critical Thinking:

1. If molecular motion increases from solids, to liquids, to gases, which substance or substances in this investigation had the highest molecular motion? Which had the lowest molecular motion?

2. Would the volume of each substance change if each were moved into a larger container? Explain

Teacher Assessment Guide

The students should select a hypothesis and a conclusion. There is no correct or incorrect hypothesis. However, the students should conclude that matter can be identified as a solid, liquid, or gas.

The **data chart** should indicate the following: (The data will be arranged differently by station.)

Sugar Cubes	Solid	Yes	Yes	Slow
Nails	Solid	Yes	Yes	Slow
Wood Block	Solid	Yes	Yes	Slow
Marbles	Solid	Yes	Yes	Slow
Baby Oil	Liquid	No	Yes	Free Flow
Colored Water	Liquid	No	Yes	Free Flow
Helium	Gas	No	No	High Speed
Carbon Dioxide	Gas	No	No	High Speed

Critical Thinking:

1. The Helium and the Carbon Dioxide have the highest molecular motion. The Sugar, Nails, Wood, and Marbles have the lowest molecular motion.
2. The volume of the Helium and the Hydrogen would change if move into a larger container. All other substances would retain the same volume. This is because Helium and Hydrogen are gases. The molecules in a gas move apart to fill the entire container. If the container is increased, the volume increases.

Goal 3 Standards Checklist

Name:	Yes	No
Demonstrated ability to utilize information in a productive and/or enjoyable manner.		
Demonstrated cooperative working skills with other students.		

