

INQUIRY SCIENCE

Grades 2–3

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Matter



What's the Matter?

Gearing Up

Get the students thinking by holding up an empty resealable plastic bag. Explain that there is something in this bag. Ask the students to tell you what they think is in the bag. Listen to their responses and tell them that in this exploration, they will discover what is in the bag. They will also examine the three states of matter—solid, liquid, and gas.

Process Skills Used

- observing
- comparing
- predicting
- classifying
- recording data

Guided Discovery

Background information for the teacher: Matter is anything that has weight and takes up space. The three states of matter are solids, liquids, and gases. Write the following properties of the states of matter on the chalkboard. *Solids:* You can see solids and they have a specific shape. You cannot easily pass an object through a solid. *Liquids:* You can see liquids and they do not have a specific shape. Liquids take on the shape of the container they are in. You can easily pass an object through a liquid. *Gases:* Gases are often invisible and can change their shape easily. Gases expand to fill whatever container they are in. You can easily pass an object through a gas.

Materials needed for each group:

3 resealable bags
colored water
a craft stick
a tennis ball



Directions for the activity:

Direct the students to place a tennis ball in one bag, put water in the second bag, and blow air in the third bag. Students will run three tests on each filled bag to determine whether it contains a solid, liquid, or gas.

1. Look at the contents of the bag.
2. Determine if the contents change shape easily.
3. Try to pass a craft stick through the contents of the bags.

As they work, the students complete the activity sheet "What's the Matter?"



Responding to Discovery

Discussion starters:

- Which bag contains a solid? How can you tell it is a solid?
- Which bag contains a liquid? How can you tell it is a liquid?
- Which bag contains a gas? How can you tell it is a gas?

Applications and Extensions

Ask students to name five different solids, five different liquids, and five different gases.

Real-World Applications

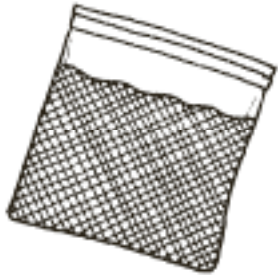
- Would you swim in a solid, a liquid, or a gas?
- Would you drink a solid, a liquid, or a gas?
- Would you sit on a solid, a liquid, or a gas?
- Is chewing gum a solid, a liquid, or a gas?
- Is the air you breathe a solid, a liquid, or a gas?



Name _____

What's the **M**atter?

Use your expert observation skills to learn about the different states of matter.



Bag 1: The water	Observations
Squeeze the bag. Does the water change shape?	
Open the bag. Can you pass a craft stick through the water?	
Can you see the water in the bag?	
What state of matter is the water?	



Bag 2: The tennis ball	Observations
Squeeze the bag. Does the tennis ball change shape?	
Can you pass a craft stick through the ball?	
Can you see the ball in the bag?	
What state of matter is the ball?	

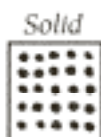


Bag 3: The bag of air	Observations
Squeeze the bag. Does it change shape?	
Can you pass a craft stick through the bag of air?	
Can you see the air in the bag?	
What state of matter is the air?	

The Atoms Family

Gearing Up

Draw three boxes on the chalkboard. Label the boxes *Solid*, *Liquid*, and *Gas*. In the box labeled *Gas*, draw a few dots (atoms) scattered throughout. In the box labeled *Liquid*, draw several dots (atoms) distributed evenly. In the box labeled *Solid*, draw many dots tightly packed together. Have students study what you have drawn while recalling the previous discovery. Point out that the atoms in the solid are so close together that they cannot move. That is why a solid does not change shape and an object cannot pass through it. Discuss how the atoms in the solid, liquid, and gas differ.



Liquids: Explain that the atoms in a liquid are more spread out. Have students hold hands in groups of three as they move around a small section of the room. The space should be small enough that they touch the other groups as they move, but still move fairly freely. Discuss how it felt to be an atom in a liquid. How big were their movements inside the area?

Gases: Explain that a gas has no definite shape. Direct the students to move freely around the room. As they move, they may explore in every corner and against every wall, but they may not leave the room, unless you open the door or window. (You won't open the door because a gas fills whatever container it finds itself in.) Discuss how it felt to be an atom in a gas. How big were their movements inside the room?

Process Skills Used

- making a model
- communicating
- classifying

Guided Discovery

Background information for the teacher:

Molecules are so small that we cannot see them. They are in constant motion whether they make up a solid, a liquid, or a gas. Atoms are the basic components of molecules. Atoms combine together to form molecules.

Directions for activity:

Explain to students that they are going to pretend that they are atoms. Atoms, just like children, are constantly moving. Everything is made up of atoms, but atoms in solids, liquids, and gases move differently.

Solids: Tell the students that the atoms in a solid are very close together. Have a group of students act like the atoms in a solid. They should group very closely in a small area and try to move together. Discuss how it felt to be an atom in a solid. How big were their movements inside the group?

Responding to Discovery

Divide the class into groups. Have each group of students demonstrate the behavior of the atoms in one state of matter. The rest of the class tries to guess what they are.

Applications and Extensions

Have students explain why it was easier to move as a liquid or a gas.



Real-World Applications

- Is all matter composed of atoms and molecules? How do you know?