

Chapter 8

# Observing Matter



## You Will Discover

- ways that matter can be grouped.
- ways that matter can change.

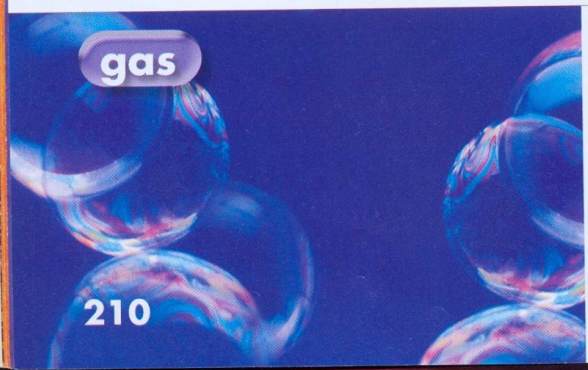
Build Background

# How can objects be described?

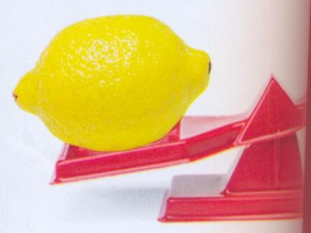


matter

gas



mass



## Chapter 8 Vocabulary

**matter** page 215

**mass** page 215

**solid** page 218

**liquid** page 220

**gas** page 221

**dissolve** page 225

**evaporate** page 228



**solid**



**solve**

**evaporate**

*Evaporate* means to change from a liquid to a gas.

# Directed Inquiry

**Explore** What is in the bags?

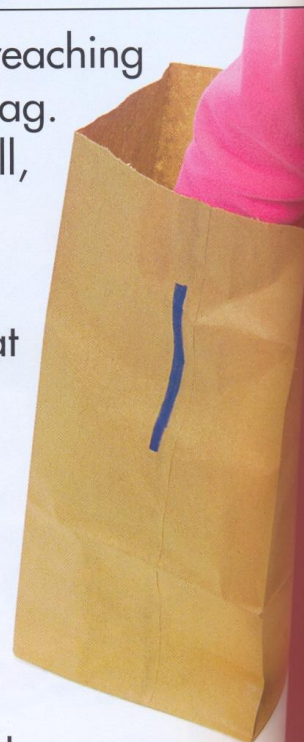
**Materials**



5 bags with  
classroom objects

**What to Do**

- 1 Take turns reaching into each bag. Touch, smell, and listen.
- 2 Predict what is in each bag.
- 3 Look in the bags. Did you predict correctly?



**Process Skills**

You can **communicate** how touching, smelling, and listening help you predict what is in the bags.

**Explain Your Results**  
**Communicate** How does touching help you predict?

# How to Read Science

## Reading Skills



### Alike and Different

Alike means how things are the same.  
Different means how things are not the same.

#### Science Story

### Lemons and Lemonade

Look at the lemon and the cup of lemonade. The lemon is yellow and tastes sour. The lemon has a bumpy coating. The lemonade is yellow and tastes sweet. The lemonade can spill all over the table.



### Apply It!

**Communicate** Tell how the lemon and the lemonade are alike and different.

Alike	Different

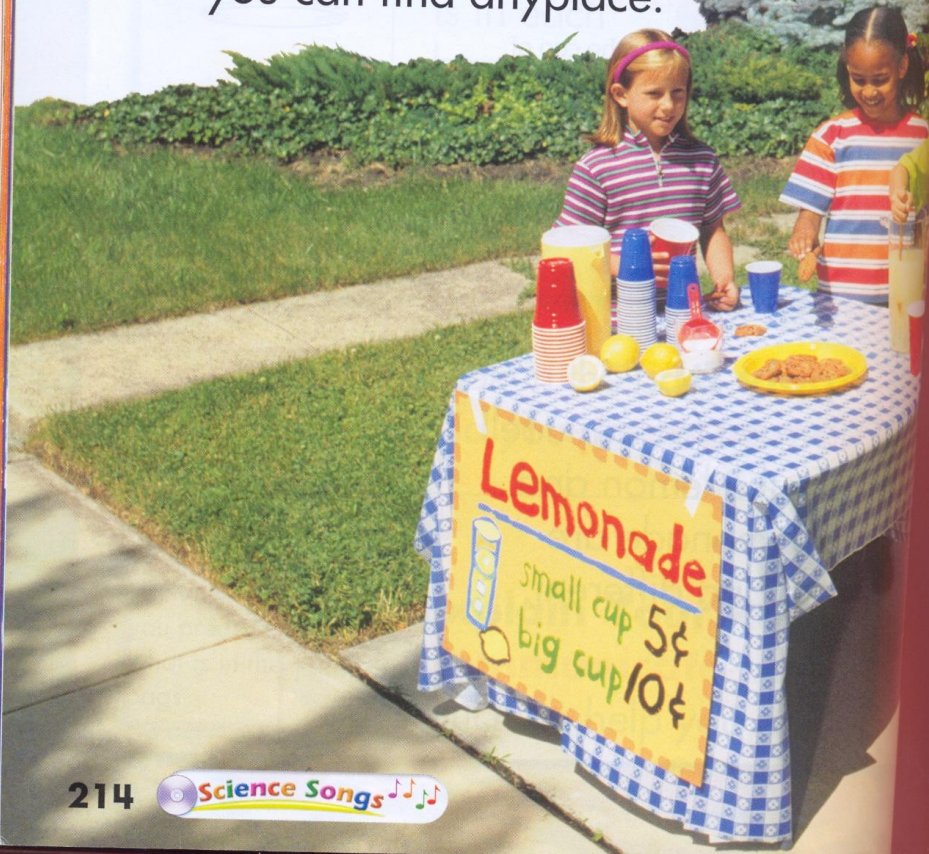
You Are There

## A "Matter" of Lemonade

Sung to the tune of "Turkey in the Straw"

Lyrics by Gerri Brioso & Richard Freitas/The Dovetail Group, Inc.

When you're making lemonade  
you use lemons and cups,  
And a great big pitcher that  
you will fill up.  
Each one has it's own shape  
and it takes up space.  
All are solid kinds of matter  
you can find anyplace.



## Lesson 1

# What is matter?

The pitcher is made of matter.  
The drink is made of matter.

**Matter** is anything that takes  
up space.

Matter has many tiny parts.

Matter has mass.

**Mass** is the amount of matter  
in an object.

Everything made of matter has mass.

**The lemon is made  
of matter. Some  
parts of matter  
are too small to  
see without a  
hand lens.**





## Describing Matter

The things in the picture are made of matter.  
 What shapes do you see?  
 What colors do you see?  
 How are the things alike and different?

The door handle is made of metal.

The wood door is a rectangle.  
 The door feels hard.

### ✓ Lesson Checkpoint

1. What are two ways you can group the things in the picture?

### 2. Writing in Science

Make a chart like this one.  
 Fill it in with words that tell about each thing.

	Color	Feel
door		
scarf		
basket		
boots		





The bag is made of cloth. You can bend the bag.

The scarf feels soft. The scarf is blue.

The brown basket feels bumpy.

The red boots feel smooth.

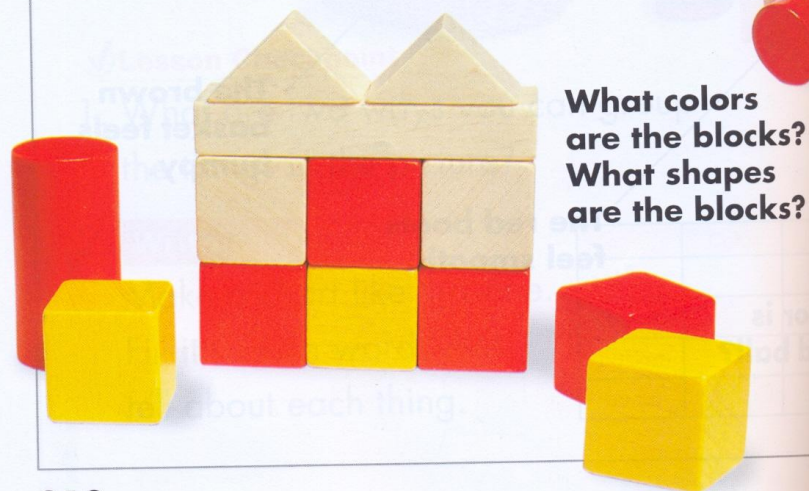
What color is the round ball?

## Lesson 2

# What are solids, liquids, and gases?

What toys do you see?  
All of the toys are solids.

A **solid** takes up space.  
A solid has its own shape.  
A solid does not change shape  
when it is moved from place to place.



What colors  
are the blocks?  
What shapes  
are the blocks?



1. ✓ **Checkpoint** What is a solid?
2. 🎯 Choose two solids from the picture.  
How are the solids **alike and different**?

## Liquids and Gases

A liquid can change shape.

A **liquid** takes the shape of its container.

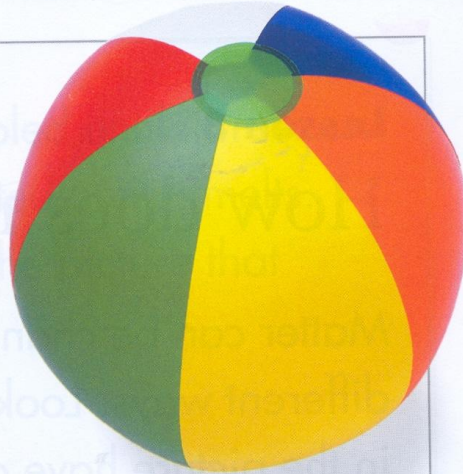
A liquid takes up space.

A liquid is matter.

Look at the different shapes a liquid can take.



Gas can change  
size and shape.  
Gas takes up space.  
Gas takes the shape  
of the container it fills.




**Gas takes the  
size and shape  
of the ball.**

Gas is a gas.  
Gas is all around us.  
Gas is matter.



**The bubbles are  
filled with air.**

**Lesson Checkpoint**

1. What is one way to group the matter on these pages?
2.  How are solids and liquids alike and different?





### Lesson 3

## How does matter change

Matter can be changed in many different ways. Look at how things in the picture have changed.

**A whole apple has one shape. Apples can be cut into new shapes.**

**The straw was straight. Now it is bent.**



**The shape of the bread changed.**

A liquid can be cooled until it freezes.  
A solid can be heated until it melts.  
Find something in the picture that  
is melting.

### Hurry!

Put the popsicle  
in the cooler.



The popsicle  
is melting.

1. ✓ **Checkpoint** How can matter be changed?
2. 🎯 How are the whole apple and the cut apple **alike and different?**



## Mixing Solids and Liquids

You can mix different kinds of matter. Look at the soup in the picture. The soup is made of different solids and a liquid.

The solids are mixed with the liquid. You can take the solids out of the liquid.



The  
ar



The n  
are sc



The chicken  
is a solid.

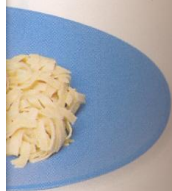


The bro  
is a liqu





carrots  
solids.

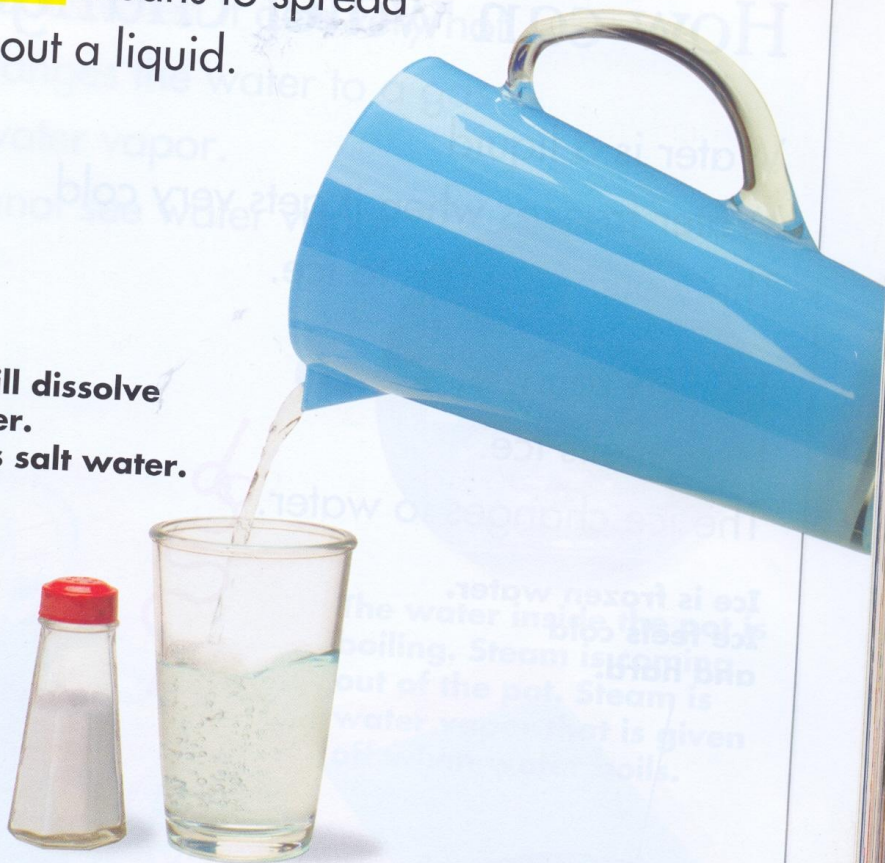


oodles  
ds.

Some solids dissolve in liquids.

**Dissolve** means to spread  
throughout a liquid.

The salt will dissolve  
in the water.  
This makes salt water.



✓ **Lesson Checkpoint**

1. What happens when a solid dissolves?
2. **Writing in Science** Tell what solids you might put in a salad. Tell what liquid you might mix with your salad.

## Lesson 4

# How can water change?

Water is a liquid.

Water freezes when it gets very cold.

The water changes to ice.

Ice is a solid.

Heat melts ice.

The ice changes to water.

**Ice is frozen water.  
Ice feels cold  
and hard.**



Water boils when it gets very hot.  
Heat changes the water to a gas  
called water vapor.  
You cannot see water vapor.



The water inside the pot is boiling. Steam is coming out of the pot. Steam is water vapor that is given off when water boils.

1. **✓ Checkpoint** How can water be changed into a gas?
2. **Technology in Science** What do people use to boil water?

## Water Can Evaporate

Everything got wet.

What will happen to the water?

Some of the water on the ground will evaporate.

**Evaporate** means to change from a liquid to a gas.

The water on the ground can change to water vapor.

**Water in an open container will disappear. Water in a closed container will not disappear.**





Heat from sunlight causes the water in the puddle to evaporate.

✓ **Lesson Checkpoint**

1. What happens to water that evaporates?
2. **Writing in Science** In your **science journal**, write about what will happen to a puddle on a hot day.

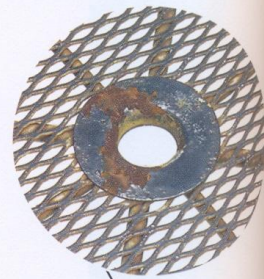


## Lesson 5

# What are other ways matter changes?

Sometimes one kind of matter changes into a different kind of matter. It will not change back to the way it was.

The table and chairs are made of iron. The picture shows that part of the table has changed to rust.



The apple has changed color inside. The apple's color will not change back.



Paper can burn.

Paper changes into ashes when it burns.

Ashes will not change back into paper.



People can use paper to start a campfire.



The paper will burn.



The paper turns into ashes when it is burned.

✓ **Lesson Checkpoint**

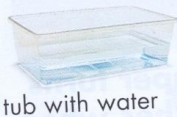
1. How can paper change?
2. **Math in Science** Suppose you had three apples. Each apple was cut into two pieces. How many pieces of apple would you have? Write a number sentence.

# Guided Inquiry

4

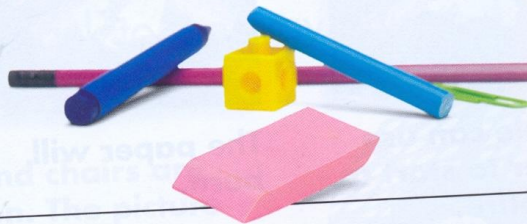
**Investigate** Will it float or sink?

## Materials



## What to Do

**1** Choose an object.



5

**2** **Predict** Will it float or sink?

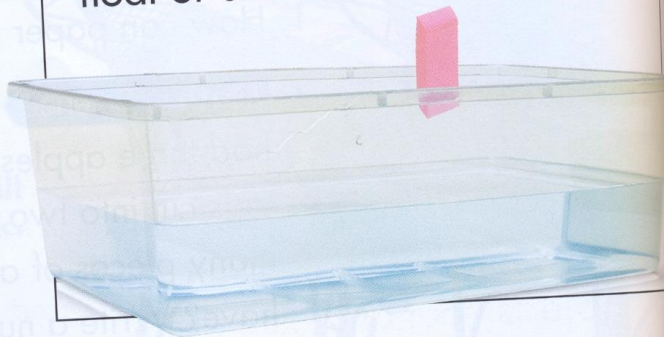


Clean up spills right away.

**3** Put the object in the water. Does it float or sink?

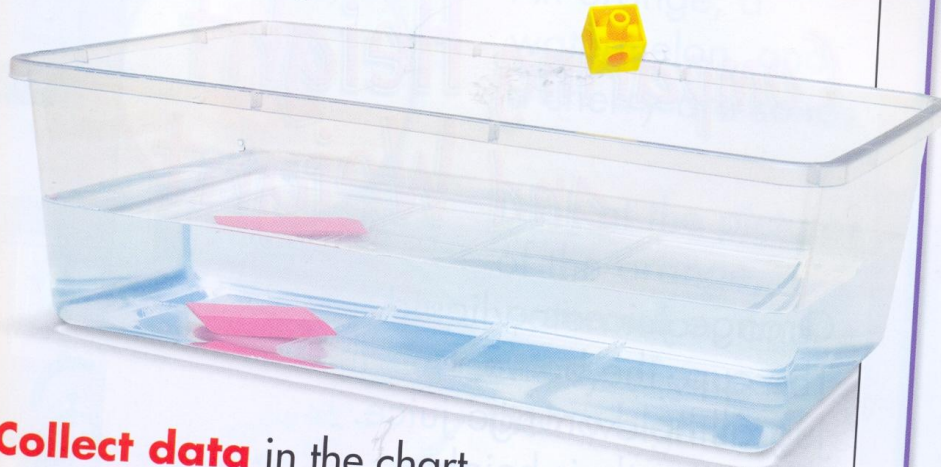
## Process Skills

When you **classify**, you sort things that are alike and different.





4 Try the other objects.



5 Collect data in the chart.

Sink or Float?		
Object	Predict	What happens?
eraser	float	sink

### Explain Your Results

1. **Classify** Which objects float and which objects sink?
2. Why do you think some objects float and others sink?

### Go Further

Would the same objects float or sink in salt water? Try it and find out.

## Math in Science

# Comparing Height and Weight

Orange juice is a liquid.  
The cup, the bottle, and the  
jug all hold orange juice.  
Compare their heights.

List the bottle, cup, and jug  
in order from tallest to shortest.



**Bottle**

**Cup**

**Jug**



**Orange**



**Watermelon**



**Cherry**

An orange, a watermelon, and a cherry are solids.

Look at the pictures of the orange, watermelon, and cherry. Compare their weights.

List the orange, watermelon, and cherry in order from lightest to heaviest.

**Lab  
zone**

### **Take-Home Activity**

Find three solid objects. Put the objects in order from lightest to heaviest. Draw a picture to show the order.

## Chapter 8 Review and Test Prep

### Vocabulary

Which picture goes with each word?

1. solid

2. liquid

3. gas



### What did you learn?

4. How are solids and liquids alike and different?
5. Look around you. Name an object you can see. What are three ways to describe it?
6. What are four ways matter can change?



Process Skills



7. **Classify** Take five objects out of your desk. What is one way you can group the objects? Now group them in a different way.

**Alike and Different**

8. How are the balls alike and different?



Alike	Different

**Test Prep**

Fill in the circle next to the correct answer.

9. What happens to water when it boils?
- (A) It changes to a solid.
  - (B) It changes to a gas.
  - (C) It changes to a liquid.
  - (D) It dissolves.
10. **Writing in Science** Write a sentence. Tell what happens when you mix salt and water.