

# States of Matter Unit

## 4<sup>th</sup> Grade

### Learning Standards

**12.4.14** Understand that matter is usually found in 3 states: liquid, solid, and gas and be able to identify the properties of each. Understand that water can be found in all three forms.

**12.4.15** Understand that an increase in temperature generally causes things to expand, and that a decrease in temperature generally causes things to contract. Understand that particles move more slowly in a solid than they do in a liquid or a gas.

**12.4.16** Understand that some substances will dissolve in water and some will not. Understand the property of density.

**12.7.33** Understand that matter can be changed in different ways. 1. Physically, a change in the size shape or state of matter (e.g., the melting of an ice cube, tearing of paper). 2. Chemically, where matter can change into another kind of matter (e.g., burning of wood, rusting of iron).

**12.7.34** Define and distinguish the properties of matter: mass, weight, volume, density, color, odor, shape, texture, and hardness.

**12.7.36** Understand the concepts of melting point, boiling point, and freezing point, and understand the concepts of evaporation, condensation, and sublimation.

**Bulletin Board:** Put up a bulletin board of various instruments used to measure the different states of matter.

**Time Allotted:** 8-60 minute classes

# States of Matter

\_\_\_\_\_ 's I Can Statements

\_\_\_\_\_ I can state the 3 states of matter; liquid, solid, and gas.

\_\_\_\_\_ I can name the properties of liquids, solids, and gases.

\_\_\_\_\_ I can tell you what happens when heat is applied to matter.

\_\_\_\_\_ I can tell you what happens when heat is taken away from matter.

\_\_\_\_\_ I can tell you how particles move in solids, liquids and gases.

\_\_\_\_\_ I can describe the property of density.

\_\_\_\_\_ I can tell you how to measure the distance between two points and what tool is used to do so.

\_\_\_\_\_ I can tell you how to measure how hot and cold something is and what tool is used to do so.

\_\_\_\_\_ I can tell you how to measure the amount of matter something has and what tool is used to do so.

\_\_\_\_\_ I can tell you how to measure the amount of space that matter takes up and what tool is used to do so.

**Day 1:**

**Introduce unit with United Streaming : Properties of Matter, Part 2: Liquids, Solids and Gases (17:00)**

Read "What Is Matter?" (abcteachit.com2002)  
"The Properties of Matter" (abcteachit.com2002)  
"The States of Matter" (abcteachit.com2002)

Assign: "Matter Activity Page 5 (abcteachit.com2002)  
"Homework Page 6 (abcteachit.com2002)

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## WHAT IS MATTER?

DEFINE THE FOLLOWING WORDS:

1. matter

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2. mass

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3. volume

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**Matter** is anything that takes up space and has mass. A small button takes up less space than an elephant, but they are both matter. The school supplies are all matter. They take up space. The amount of space an object takes up is called **volume**. Some objects have more volume than others. For example, a globe takes up more space than a ruler does. The globe has more volume than the ruler.

**Mass** is the measure of how much material makes up the object. You can place a pencil and a soda on a balance scale to see which of the objects has more mass. We know that the soda will have more mass than the pencil. It weighs more, and it takes up more space. Everything that has volume and has mass is matter.

**ALL OF US ARE MATTER! WE TAKE UP SPACE AND HAVE MASS!**

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# THE PROPERTIES OF MATTER



Look at these two objects. Describe their properties.

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

Look at the picture of the yellow cake above. It has property. **Property** is something about an object that can be observed, such as its size, shape, color, smell, or sound. All of these describe the properties of this cake. All matter has property. Color the balloons 3 different colors. Now write properties for them.

**I'VE GOT PROPERTIES!**

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## THE STATES OF MATTER

USE THE LIST TO WRITE THE CORRECT STATE OF MATTER. PLEASE WRITE NEATLY.

There are three forms of the states of matter. They are solids, liquids, and gases. A person, ice, a puppy, and a flowerpot are all examples of the solid state of matter. Water, juice, and coffee are all forms of the liquid state of matter. Air and carbon dioxide are forms of the gas state of matter. Imagine a fishbowl. There are all three states of matter in the fish bowl. The fish and the rocks are solid. The water is liquid. The oxygen the fish breathes is gas. Everything in our world has matter in one of these three forms.

## OBJECTS STATE OF MATTER

1. frog 2. lemonade 3. oxygen 4. chair 5. water 6. desk 7. carbon dioxide 8. orange juice

Solids	Liquids	Gases

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## MATTER ACTIVITY PAGE

THIS ACTIVITY PAGE WILL HELP YOU REVIEW MATTER, THE STATES OF MATTER, AND THE PROPERTIES OF MATTER. ANSWER EACH QUESTION. PLEASE WRITE NEATLY.

1. The measure of how much material makes up an object is the \_\_\_\_\_.
2. \_\_\_\_\_ is the amount of space an object takes up.
3. The \_\_\_\_\_ are solids, liquids, and gases.
4. Everything that takes up space and has mass is \_\_\_\_\_.
5. The \_\_\_\_\_ are the things about an object that can be observed, such as its size, color, shape, or sound. matter volume mass properties of matter states of matter

Name \_\_\_\_\_

Keep a running list of everything surrounding you that is **matter**. Categorize each item by listing what **state of matter** each one is in.

# States of Matter

Solids	Liquids	Gases

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# **HOMEWORK PAGE**

**THIS HOMEWORK PAGE IS PROVIDED FOR YOU TO PRACTICE WHAT YOU ARE LEARNING IN CLASS ABOUT MATTER. TAKE YOUR TIME AND STUDY!**

**PART A: MATCHING**

**MATCH THE WORD FROM BELOW TO ITS MEANING. YOU JUST NEED TO WRITE THE LETTER.**

1. \_\_\_\_\_ solids, liquids, and gases
2. \_\_\_\_\_ the amount of space an object takes up
3. \_\_\_\_\_ anything that takes up space and has mass
4. \_\_\_\_\_ something that can be observed about an object, such as the color, size, shape, or sound
5. \_\_\_\_\_ the measure of how much material an object contains

**A. volume B. mass C. matter D. states of matter E. properties of matter**

**PART B: LOOK AT OR IMAGINE AN APPLE. DESCRIBE ITS PROPERTIES OF MATTER.**

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## SHOW WHAT YOU KNOW!

READ EACH OF THE FOLLOWING. CHOOSE THE BEST ANSWER.

1. The amount of space an object takes up is called \_\_\_\_\_.  
a. mass b. volume c. matter d. property
  
2. Rocks are the \_\_\_\_\_ form of the states of matter.  
a. liquid b. gases c. solid d. both a and b
  
3. When describing the color, size, shape, or smell of an object, you are describing the  
a. properties of matter  
b. states of matter  
c. volume of matter  
d. mass of matter
  
4. Mass is \_\_\_\_\_.  
a. the measure of how much material an object is made of  
b. anything that takes up space and has mass  
c. the color or shape of an object  
d. both b and c

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## ANSWER PAGE

PAGE 1:

1. anything that takes up space and has mass
2. the measure of how much material makes up the object
3. the amount of space an object takes up.

PAGE 2: 1-2 answers will vary

PAGE 4:

1. solid
2. liquid
3. gas
4. solid
5. liquid
6. solid
7. gas
8. liquid

PAGE 5:

1. mass
2. volume
3. states of matter
4. matter
5. properties of matter

PAGE

6: 1. D

2. A

3. C

4. E

5. B

PAGE 7: 1. b

2. c

3. a

4. a

## Day 2: Experimenting

Students will be able to classify materials as solids, liquids, and gases.

Students will define the terms solids, liquids, and matter.

Students will be able to show that when materials are manipulated they can take on different properties.

### MATERIALS:

4 taper candles and matches

Alcohol

Vinegar

Juice

Sandwich bags

Balloons

Variety of solid objects that will fit in the baggie

## Activity

Write, "What makes something a solid or liquid?" on the board.

"Does anyone know what a solid is?" Accept reasonable answers. Explain that they will learn why it is a solid.

"Does anyone know what a liquid is?" Accept reasonable answers. Explain that they will learn why it is a liquid.

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## Activity

**Each group gets a baggie with a solid object in it.**

1. Discuss "matter", that which is anything that has mass and takes up space (volume).

2. Mass is a measure of the amount of matter an object has. Volume is the amount of space that matter takes up.
3. Let each group come up with some descriptive words for their object in the baggie. Share with the group.
4. Discuss how these objects are "visible".
5. Ask the students to try and put their finger through their object. Stress that things don't pass through solids easily.
6. This is because matter is made up of tiny particles called molecules. Molecules in a solid are packed together very tightly. Bring 4 students up. Put a piece of string on the floor in a pretty small circle, but big enough for the students to squeeze into. These kids represent a solid.
7. Look at this ice cube. Does it have a definite shape and definite volume? What was this ice cube made out of? WATER. What do we call it when a liquid becomes a solid? FREEZING
8. Then, the definition of a solid is...anything that has definite volume and definite shape.

## Activity

Set the 4 candles around the room and light each one. Look but don't touch. Watch the candle closest to your group. "Why would I be using candles for this lesson? What do you expect to see happen?" If someone says that they will melt, I will ask them why? If someone says the flame or fire, I will then ask, "When a fire starts, what do you feel?" They should answer heat. Hopefully the candles are melting by now.

Direct the kids to look at the candles again. What is happening? What does melted wax look like? What will happen to the wax when we blow out the fire?" Ask the students to write down what they think made the solid candle turn to liquid and then why it turned back to a solid

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**LAB EXPERIENCE 1**

1. What makes something a solid or a liquid? \_\_\_\_\_

\_\_\_\_\_

2. What is a solid? \_\_\_\_\_

\_\_\_\_\_

3. What is a liquid? \_\_\_\_\_

\_\_\_\_\_

<b>SOLID</b>	<b>LIQUID</b>	<b>GAS</b>

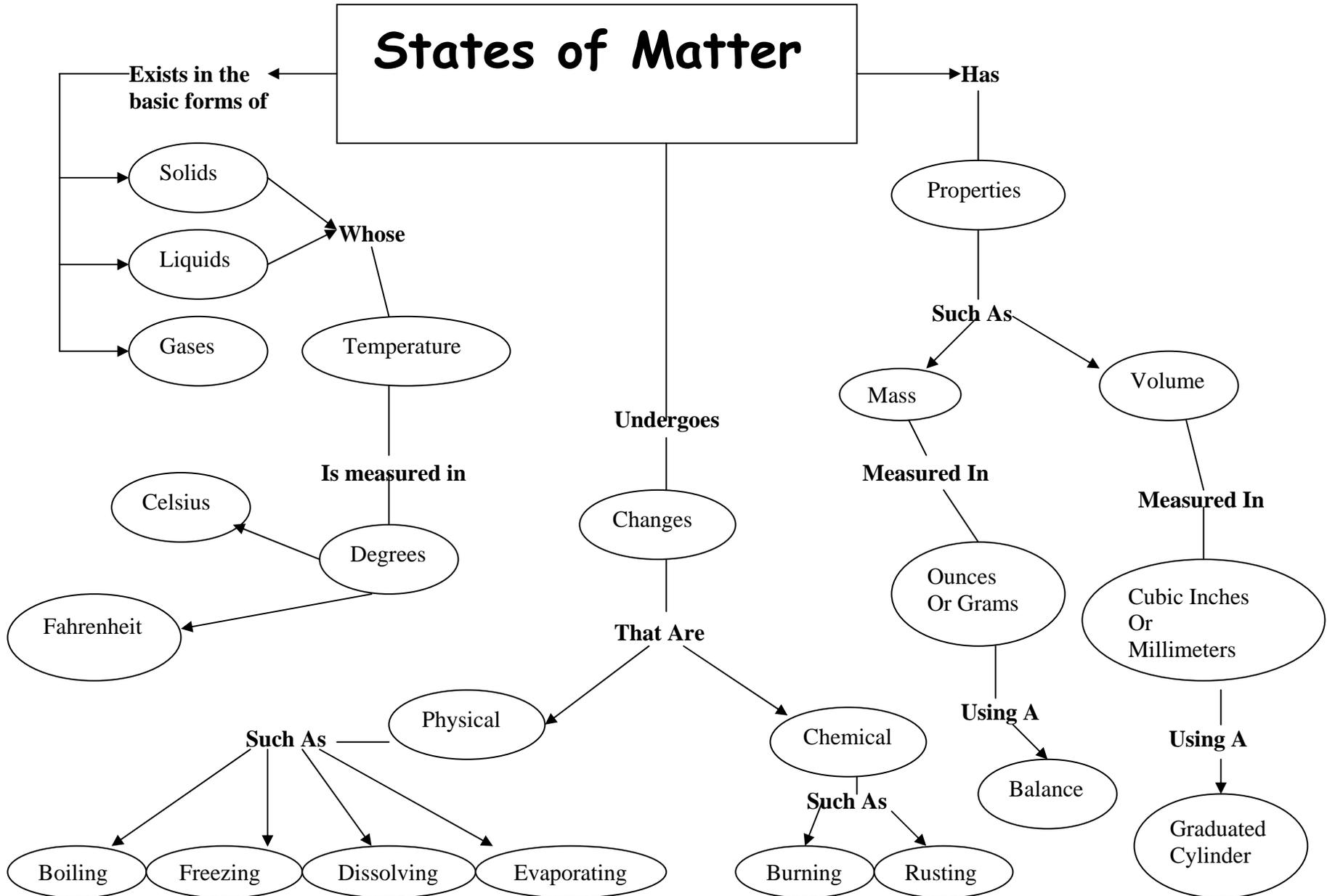
**Day 3:**

**United Streaming Video:** Solids, Liquids, and Gases: Segments  
Phase Changes in Matter 6:26  
Chemical Changes vs. Physical Changes 1:52  
Evaporation and Condensation 1:21  
Boiling, Melting, Freezing, and Sublimation 3:04

**Kidspiration:** Start a web of what we're learning in this unit. See sample on next page.

**Read abcteach** "What Makes Up Matter?" page 1  
"Can Particles in Matter Move?" page 2  
"Does Matter Change?" page 3  
"What Are Chemical Changes?" page 4

**Assign:** Review Page 5 and 6



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## WHAT MAKES UP MATTER?

Matter is made up of tiny particles. These particles are called **atoms**. Atoms are the smallest unit of matter. You can't see atoms because they are so tiny. Two or more atoms can join together to make larger particles of matter. These larger particles can join other particles to make up the matter you can see. Atoms join together to make up different kinds of matter. Oxygen is made up of just one kind of atom. Water has two atoms that join together to make water.

## ANSWER THE QUESTIONS:

1. What is an atom?

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2. Why can't you see an atom?

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3. How many kinds of atoms does water have?

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4. How many kinds of atoms does oxygen have?

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## CAN PARTICLES IN MATTER MOVE?

Particles are different in different states of matter. The particles in liquids are much farther apart than particles in solids. Particles in solids pull toward each other. A solid can keep its shape because its particles stay close together. Particles in solids can move back and forth but they can't change places with another particle. Particles in liquids are farther apart. The pull between particles in liquids is weaker than the pull in solids. Liquids can change shapes because the particles can move around each other and change places. Particles in gases do not pull together strongly. Gas particles can move around more than the particles in liquids and solids. A gas can move to fill any space because its particles move freely.

### ANSWER THE QUESTIONS:

1. Are particles in all forms of matter the same? Yes No

2. How are the particles in liquids different from the particles in solids?

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3. Why can gas fill any space?

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## DOES MATTER CHANGE?

Matter changes. When you play with clay and change its shape, it is still clay. This is called a **physical change**. Changes in the size and shape of an object are physical changes. If you take a cup of water and place it in the freezer, the water changes from a liquid to a solid when its temperature reaches 0 degrees Celsius. Water in its solid form is ice. Ice can change from a solid to a liquid when it is heated. Heat speeds up the moving particles in ice and the particles move farther apart. Water that is left in a container in the sun will disappear after time. This is called evaporation. **Evaporation** is when a liquid changes into to a gas. Water in its gas form is called **water vapor**. Water will quickly change to a gas when the water is heated to 100 degrees Celsius. Cooling air causes water vapor to change to a liquid. This is called **condensation**. If you take a glass of water and add ice to it, small drops of water will form on the outside of the glass. This is condensation.

### ANSWER THE QUESTIONS:

1. What are physical changes in matter?

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2. Water will freeze at \_\_\_\_\_.

3. What does heat do to the particles in ice?

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4. What is evaporation?

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5. What is water vapor?

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6. What happens to water when it is heated to 100 degrees Celsius?

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## WHAT ARE CHEMICAL CHANGES?

A **chemical change** is a change that causes matter to become a new kind of matter. When a fire is built in a fireplace, you use logs and start a fire. The wood burns and turns into ashes and smoke. The wood becomes a different kind of matter when it is burned. This is a chemical change. Another example of a chemical change is silver. When a silver fork or spoon turns black, it is because a gas in the air has caused the silver to change color. The part of the silver that has changed color is tarnished.

### ANSWER THE QUESTIONS:

1. What is a chemical change?

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2. Give two examples of a chemical change.

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## REVIEW PAGE

### ANSWER THE FOLLOWING.

1. \_\_\_\_\_ is water in its gas form.  
a. evaporation b. condensation c. atom d. water vapor
  
2. A chemical change takes place when one form of matter changes to \_\_\_\_\_.  
7. an atom  
b. another kind of matter  
c. property  
d. none of these
  
3. Which of the following has particles that move around freely and can change places?  
a. solid b. liquid c. wood d. ice
  
4. An atom is a \_\_\_\_\_.  
a. a fire burning  
b. a small particle that makes up matter  
c. a small frog  
d. a cold ice cube
  
5. A solid can keep its shape because \_\_\_\_\_.  
a. particles in solids stay close together  
b. particles in solids stay far apart  
c. particles in solids are cold  
d. particles in solids are hot

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## WORD UNSCRAMBLE

1. lcpetra \_\_\_\_\_

2. oamt \_\_\_\_\_

3. sdlio \_\_\_\_\_

4. quiild \_\_\_\_\_

5. sag \_\_\_\_\_

6. rmttae \_\_\_\_\_

7. aspcliyh \_\_\_\_\_

8. saecnhg \_\_\_\_\_

9. pvoeraaet \_\_\_\_\_

10. acmliech \_\_\_\_\_

11. iacnonosednt \_\_\_\_\_

12. avpro \_\_\_\_\_

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## IT'S QUIZ TIME!

USE THE WORDS BELOW TO COMPLETE THE SENTENCES.

1. Water in its gas form is called \_\_\_\_\_.
2. 0 degrees Celsius is the \_\_\_\_\_ of water.
3. \_\_\_\_\_ changes change the way matter looks.
4. What happens to wood when you burn it is an example of a \_\_\_\_\_  
\_\_\_\_\_.
5. A small particle that makes up matter is called an \_\_\_\_\_.
6. \_\_\_\_\_ happens in matter when it changes from a liquid to a gas.
7. \_\_\_\_\_ is when matter changes from a gas to a liquid.

freezing point    chemical    physical    condensation    evaporation    water vapor    atom

ANSWER PAGE

PAGE 1:

1. a small particle of matter 2. it is too tiny to see 3. two 4. one

PAGE 2:

1. no

2. The particles in liquid are farther apart than those in solids. The pull between particles in liquid is weaker than the pull in solids.

3. because its particles move freely

PAGE 3:

1. changes in the size and shape of an object.

PAGE 4:

2. 0 degrees Celsius

3. speeds up the particles in ice  
so they move farther apart

4. when liquid changes to gas

5. water in a gas form

6. it evaporates/ quickly changes to a gas

PAGE 5: 1. a change that causes matter to  
be a new kind of matter

2. wood turns to ash when burned,  
silver turns black or tarnishes

PAGE 6: 1. d 2. b 3. b

4. b 5. a

PAGE 7:

1. particle

2. atom

3. solid

4. liquid

5. gas
  6. matter
  7. physical
  8. changes
  9. evaporate
  10. chemical
  11. condensation
  12. vapor
- PAGE 8: 1. water vapor
2. freezing
  3. physical
  4. chemical change
  5. atom
  6. evaporation
  7. condensation

## Day 4,5,6 Experimenting

Begin with **United Streaming: Discovering Math: Measurement**

Segments

Volume and Capacity: 2:11

Mass: 1:55

Tools Used for Measuring: 5:03

Explain that we will be going through a variety of stations that will help us understand how states of matter are measured.

1. States of Matter
2. Physical Properties of Matter
3. Chemical Properties of Matter
4. Length
5. Volume
6. Mass

### Supply List for all centers

Ziploc bags

Small solid objects

Ice cubes

Perfume

Clear plastic glasses

Variety of liquids for display only

Yarn

Standard weights

Bowl for mixing

Objects for measuring mass: rock, pinecone, piece of chalk, cotton ball, pencil, balloon, eraser

Coolers with ice

Kool-Aid

Sugar

Ziplock bags again

Index cards

Balloons

Paper Pencils

Water

Popscicle sticks

1 balance

Trail Mix ingredients: M&Ms, nuts, raisins, pretzels, cereal

Baggies

Napkins

Small paper cups x 2 (one for trail mix, and one for Kool-Aid)

Pitcher

# States of Matter

## Activity

1. Discuss with the students that matter takes up space and that you are going to prove it today.
2. Brainstorm things that take up space in their refrigerators at home.
3. What would happen if the refrigerator were full? Could you add more? Why?
4. Add the golf balls to the beaker. Ask the students if the beaker is full? They will probably say yes. Then add the pebbles. Ask them, again, if the beaker is full? Add the sand. Is the beaker full NOW? Do you think I could add some water? Try it.
5. Could you keep adding books to the top of your desk? Why?
6. Fill a glass of water to the top. Ask: Could I add more water? Why?
7. You see air takes up a lot of space. Until a container is completely rid of air and space, it isn't truly full
8. Show the group a balloon. Ask the students to name the properties of the balloon. List their answers. Point out that they named things like shape, color, size, smell, texture, hardness, and mass.
9. Working with a partner, discuss the properties of this glass of water and this pencil. Share their ideas with the group.
10. ALL THE THINGS THAT SURROUND US AND THAT WE CAN TOUCH ARE EXAMPLES OF MATTER. WHEN WE DESCRIBE AN OBJECT, WE ARE NAMING ITS PROPERTIES.
11. Refer to the Properties of Matter worksheet. Ask students to classify the objects by size, mass, and hardness. Then ask them to list them from the heaviest to the lightest.

## Activity (Physical Properties)

1. Hold up baggies that have trail mix ingredients in them. For example: M&Ms, nuts, raisins, pretzels,
2. Ask students to describe each product according to its physical properties. Physical properties include things like color, shape, odor, and texture.
3. Now pour all of these into a bowl and stir up. Give each child a small cup of trail mix.
4. Ask the students to pull out one of the ingredients from their cup. Can the ingredients go back to their original state? Could we make a baggie of just raisins again, if we wanted to? Then these are the physical properties.

## Activity (Chemical Properties)

1. Hold up a package of Kool-Aid. Pour the powder into a pitcher. Add a cup of sugar. Finally add your water. Ask the students if this can be put back into its original state, sugar, powdered Kool-Aid, etc. The answer is no. This is a chemical change.
2. Would pounding a nail into a piece of wood be a physical or chemical change? Can I get the nail back out of the wood? Yes, so it is physical.
3. Would a bonfire be a physical or a chemical change? Can I get the logs back to stack in a pile? No, so it is a chemical change.
4. What are some other examples of chemical changes? Some examples would be fireworks, rusting nails, cooking an egg, baking anything, landfills, etc.
5. Now, you can each have a glass of chemical change...that is, Kool-Aid!

Name \_\_\_\_\_

## Properties of Objects

Objects	SIZE		MASS		HARDNESS		Classify the objects from the largest to the smallest.
	Large	Small	Heavy	Light	Hard	Soft	
A student desk							1.
Your pencil							2.
A piece of chalk							3.
The flag							4.
A blackboard							5.

Describe the following three things with a word or two.

	Physical Property 1	Physical Property 2	Physical Property 3
Cotton ball			
Rock			
Tuning fork			

## Activity 11 (Measuring Temperature)

1. What am I holding up? (Thermometer) What can you tell me about a thermometer? Measures temperature, has mercury in it, goes up when it gets hot, etc
2. Thermometers measure temperatures in two ways. One is in Celsius degrees and the other is? Fahrenheit
3. What is the normal temperature of a person that is well? Would (pick a student) come up? I will measure your temperature. All of you should have the same.  $98.6^{\circ}$  Record this on your sheets.
4. Does anyone know at what temperature water boils? Record the temperature as soon as it starts to boil. It depends on whether you are measuring in Celsius or Fahrenheit. Celsius is  $100^{\circ}$  and Fahrenheit is  $212^{\circ}$
5. Put the thermometer in some water that is at room temperature and measure the temperature. Ask students to carefully add 3 ice cubes to this water. First of all, watch your thermometer and record the temperature one minute from now. Now wait and we'll do it again at 3 minutes. Will \_\_\_\_\_ watch the clock and tell us when 3 minutes have gone by? What is happening to the mercury in the thermometer? Going down. What is happening to the ice? Melting. What is the process called when a solid is changed to a liquid? Melting
6. What do we call it when a liquid changes into a gas? Evaporation  
What do we call it when a gas changes into a liquid? Condensation  
What do we call it when a liquid changes into a solid? Freezing

Name \_\_\_\_\_

## Temperature Measurement

	Celsius Temperature	Fahrenheit Temperature
Body Temperature (Use one student)		
Take the first reading of the thermometer at room temperature		
Temperature at which water boils		
Add 3 pieces of ice temperature at 1 minute		
Continue watching thermometer...2 minutes		

Match the definitions to the correct term.

Liquid turns into a gas

Liquid turns into a solid

Gas turns into a liquid

Solid turns into a liquid

Freezing

Melting

Evaporation

Condensation

## Activity (Measuring Length)

1. When would it be appropriate to use a ruler to measure things? When would it be better to use a tape measure?
2. What are the units called that we use when we use a ruler? Can be inches or centimeters. Be sure to point out the metric system, as well as the standard one.
3. Working with a partner, let's measure how tall you are. I want a student from one class to measure one of the others. Share those measurements. Now, let's do each other's arm span. If your rulers have both metric and standard, have the students give measurements in both.

Working with a partner, measure the other objects and record them on the record sheet.

Name \_\_\_\_\_

## Linear Measurement

Object	Inches	Metric
1. How tall are you?		
2. What is your arm span?		
3. Length of this table		
4. Height of this table		
5. Length of your marker		
6. Width of a book		

Which unit of measurement had larger numbers? Standard (inches) OR Metric  
Which things on this list would be better described in feet, not just inches?

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## Activity (Measuring Liquids)

1. Pour some water into the measuring cup that holds 2 cups. It has an orange dot on the handle. Record the quantity of water in ounces.
2. Now pour that same water into another measuring cup that has an orange dot. They are stacked together. Again, measure the quantity. Aren't the two of these almost the same size? How can the water be lower in this one and still measure the same quantity? The quantity is equally divided in all cups, so that they have the same answer.
3. Let's look at some other measurements. Show them how liquids take on the shape of the container it is in. This blue glue bottle has how many ounces? 4 oz./ 118.3 ml. The mouthwash would have how many ounces, if it were full? 24 oz./ 710 ml. The Elmer's Glue would have how much? 7.625oz. and 225 ml. These are all liquids because they do not hold their shape unless they are in a container. If I put the mouthwash in the glue bottle, it would still just hold 4 oz.
4. Now working with a partner measure the volume of liquid in each of these containers. You will pour your liquid into one of the graduated cylinders. Be careful not to spill, because each group has to measure these same amounts and if you spill, their answer sheets will be wrong.

Name \_\_\_\_\_

## Liquid (Volume) Measurement

Use a graduated cylinder or measuring cup to measure the volume in each container.

	Prediction (ounces)	Volume (Standard)	Volume (Metric)
Container 1			
Container 2			
Container 3			
Container 4			
Container 5			

When would you need to know how to measure liquids in your everyday life?

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## Activity (Measuring Mass)

1. Ask a student to move something that is very heavy in your area. Point out that the object is too heavy.
2. Today we will be looking at a balanced scale. What happens when I put this pinecone on one side? If I use these weights, can I figure out how much the pinecone weighs? How? You can write down the pinecone on your worksheet.
3. Let's try this rock. What is its mass? You can write down the mass of this rock on your worksheet too.
4. Work with a partner. Write down the mass of each object as you weigh them. Use a piece of chalk, cotton ball, pencil, balloon, or an eraser. You can use any of the scales on the table.
5. Now rate them from heaviest to lightest.

Name \_\_\_\_\_

## Mass Measurement

Object	Estimate of Mass	Actual Mass
1.		
2.		
3.		
4.		
5.		

Name three places or times that you would need to know how to measure mass?

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# Exploring Gases

1. What is in front of your nose? Pick up the index card and fan yourself.
2. Moving air makes this breeze.
3. Pick up your balloon and blow it up. Do not tie it. Now let it deflate without it leaving your hands.
4. Could you see the "substance" that that blown into the balloon? That substance was a gas. What are some gases? Oxygen, Hydrogen, Helium, Carbon Dioxide
5. Can you see gas? Gases are usually invisible.
6. One time it isn't is when we see steam. An ice cube is a solid. When I hold it between my hands it turns into a liquid. It is melting. I am going to add some water to this pan and turn up the heat. What is happening to the water, as it gets hotter? BOILING Now, watch. What do you see coming out of the pot? Steam. That is a gas, one that we can see. We see it because the gas is hitting cooler air and condensing. Put the lid on the pot. Look what happens when I put the lid on this pot. Where did those water spots come from? This is called CONDENSATION. Let the water continue to boil until it is gone. We'll come back to it later.
7. Spray some perfume. Raise your hand when you smell it. How did that aroma get to your noses? Perfume, when sprayed, is a vapor or gas. Gases disperse through the air and travel to your noses that way.
8. Gasses take on the shape and the volume of their container.
9. Now, everyone get up and move around this space. This is how molecules move in gases. They are much further apart and move freely. Show the picture of molecules of water.
10. Look at this pot one more time. When we left it, there was water in it. Now there isn't any. What has happened to it? EVAPORATION

Name/# \_\_\_\_\_

# States of Matter

1. A \_\_\_\_\_ has no shape and sometimes we can't \_\_\_\_\_ it or \_\_\_\_\_ it.

2. A solid is \_\_\_\_\_, has \_\_\_\_\_, and we can see it and \_\_\_\_\_ it.

3. A \_\_\_\_\_ has not shape, but it takes the \_\_\_\_\_ of the container it is in.

4. How many forms does matter have? \_\_\_\_\_

5. Name the 3 states of matter.

\_\_\_\_\_

6. Is jello a liquid or a solid, or combination of both? \_\_\_\_\_ Why?

\_\_\_\_\_

## Word Box

feel   feel   form   gas   heavy   liquid   see   shape

## **Day 7: Review Day**

### **Computer lab:**

Students will have the opportunity to go to <http://www.brainpop.com/science/matter/statesofmatter/>

Students will have the opportunity to go to: <http://www.quia.com/custom/2202main.html>

## **Day 8: Final Assessment**

## **On-going Assessments:**

Students will be assessed on the following:

1. Classroom participation
2. Team work during labs
3. Activity pages
4. Journal entries
5. Quizzes
6. Final CRT

## Resources:

<http://www.nyu.edu/pages/mathmol/textbook/4gradecover.html>

MathMol - Matter is discussed at an elementary level

<http://www.brainpop.com/science/matter/statesofmatter/>

Brainpop - States of Matter and States of Matter Advanced

<http://www.bbc.co.uk/schools/gcsebitesize/chemistry/structure/particlesfrev1.shtml>

BBC - Shows particles in solids, liquids and gases and how they interact when heat is added

[http://www.chem4kids.com/files/matter\\_intro.html](http://www.chem4kids.com/files/matter_intro.html)

Reference: Introduction information on the states of matter (Some of this information is above fourth grade level)

<http://www.quia.com/custom/2202main.html>

Interactive: Play games to reinforce skills about the states of matter

<http://www.cdli.ca/CITE/matter.htm>

Reference: A lot of good information to use with a States of Matter unit

<http://www.abcteach.com>

References and activity pages for many activities

<http://www.unitedstreaming.com>

Variety of video clips shown throughout the unit