Name _____ Date _____ Class _____

Describing Matter

This section describes the kinds of properties used to describe matter. It also defines elements and contrasts compounds and mixtures.

Use Target Reading Skills

Write a definition of each Key Term in your own words.

matter: _____

chemistry: _____

substance: _____

_____

physical property: _____

_____

chemical property: _____

_____

element: _____

_____

atom: _____

_____

chemical bond: _____

_____

molecule: _____

_____

compound: _____

_____

chemical formula: _____

_____

mixture: _____

_____

heterogeneous mixture: _____

_____

homogeneous mixture: _____

_____

solution: _____

_____

Describing Matter *(continued)*

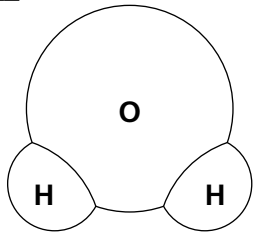
Properties of Matter

1. The study of the properties of matter and how matter changes is called _____.
2. Is the following sentence true or false? Table sugar and table salt are pure substances. _____
3. A(n) _____ property is a characteristic of a pure substance that can be observed without changing the substance into something else.
4. Complete the table by classifying each property as either a physical or chemical property.

Properties of Matter	
Property	**Physical or Chemical?**
Ability to burn	**a.**
Color	**b.**
Flexibility	**c.**
Ability to tarnish	**d.**
Ability to freeze	**e.**
Ability to rust	**f.**

Elements

5. A pure substance that cannot be broken down into any other substances by chemical or physical means is a(n) _____.
6. Is the following sentence true or false? The basic particle from which all elements are made is a molecule. _____
7. When atoms combine, the force of attraction that holds them together is a(n) _____.
8. How many atoms of hydrogen are in this water molecule? _____



Compounds

9. What is a compound?

_____

_____

_____

10. What is the ratio of atoms in carbon dioxide, or CO_2?

_____

11. What is the chemical formula of carbon monoxide?

_____

12. Is the following sentence true or false? When elements chemically combine, they form compounds that have properties that are similar to those of the uncombined elements. _____

Mixtures

13. A(n) _____ is made of two or more substances that are together in the same place but are not chemically combined.

14. What are two ways in which mixtures differ from compounds?

a. _____

_____

b. _____

_____

15. Circle the letter of each mixture below that is heterogeneous.

a. damp soil
b. sugar water
c. brass
d. salad

16. Is the following sentence true or false? A solution is an example of a homogeneous mixture. _____

17. What are two ways in which mixtures differ from compounds?

_____

_____

_____

_____

Name _____ Date _____ Class _____

Describing Matter

Understanding Main Ideas

Classify each of the following properties by writing physical or chemical on the line.

_____ **1.** Texture

_____ **2.** Ability to react with other substances

_____ **3.** Ability to conduct heat

_____ **4.** Hardness

_____ **5.** Lack of ability to rust

_____ **6.** Physical state

Answer the following questions on the lines provided.

7. How are elements and compounds related?

_____

_____

_____

8. What are two ways in which mixtures differ from compounds?

_____

_____

_____

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term in the left column.

____ **9.** matter

____ **10.** chemistry

____ **11.** substance

____ **12.** atom

____ **13.** chemical bond

____ **14.** molecule

____ **15.** chemical formula

____ **16.** heterogeneous

____ **17.** homogeneous

____ **18.** solution

a. the basic particle of an element

b. a mixture in which you can see the different parts

c. anything that has mass and takes up space

d. a particle formed when two or more atoms combine

e. a single kind of matter that is pure

f. a kind of homogeneous mixture

g. the study of the properties of matter

h. a mixture in which different parts cannot be seen

i. tells the elements and ratio of atoms in a compound

j. the force of attraction between two atoms

Name _____ Date _____ Class _____

Measuring Matter

This section explains the difference between mass and weight. It also explains what the density of a substance is.

Use Target Reading Skills

Before you read, preview the red headings. In the left column of the chart, write a what or how question for each heading. As you read, complete the chart by writing the answers to your questions.

Measuring Matter

Question	Answer
How are weight and mass different?	Weight is a measure of . . .

Weight and Mass

1. A measure of the force of gravity on an object is called _____.
2. Is the following sentence true or false? You weigh more on the moon than you do on Earth? _____
3. What is mass?

_____

_____

_____

4. Why do scientists prefer to describe matter by its mass rather than its weight?

_____

_____

_____

_____

5. What system of units do scientists use to measure the properties of matter?

_____

6. The SI unit for mass is _____.

Volume

7. The amount of space that matter occupies is called its _____.
8. List three common units of volume.

_____

_____

9. What formula do you use to find the volume of a rectangular object?

_____

Measuring Matter *(continued)*

Density

10. Why does a kilogram of sand take up much less space than a kilogram of feathers?

_____

_____

_____

11. What formula do you use to calculate the density of an object?

_____

12. If you drop a block of iron and a block of wood into water, the iron sinks and the wood floats. What can you conclude about the density of iron and wood compared to the density of water?

_____

_____

_____

_____

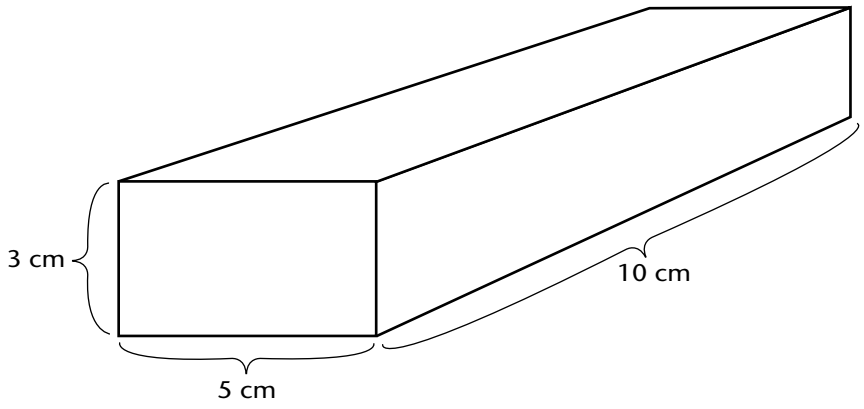
13. Is the following sentence true or false? The density of a substance varies with samples of that substance. _____

Measuring Matter

Understanding Main Ideas

Use the figure below to answer the following questions. Write your answers on a separate sheet of paper.

1. What is the volume of the solid in the figure? Show your work. Be sure to use correct units of measurement.



2. The solid has a mass of 180 g. What is the density of the solid? Show your work. Be sure to use correct units of measurement.
3. Would the above solid have a mass of 180 g on the moon? Would it have the same weight on Earth as on the moon? Explain your answers.
4. The solid above sinks to the bottom when you put it in a container filled with water. What does that tell you about its density?
5. Will every solid with the same dimensions have the same density? Explain your answer.

Building Vocabulary

Write a definition for each of the following terms on the lines below.

6. mass _____

_____

7. volume _____

_____

8. density _____

_____

9. Give two examples of common units for each of the above measurements.

_____

_____

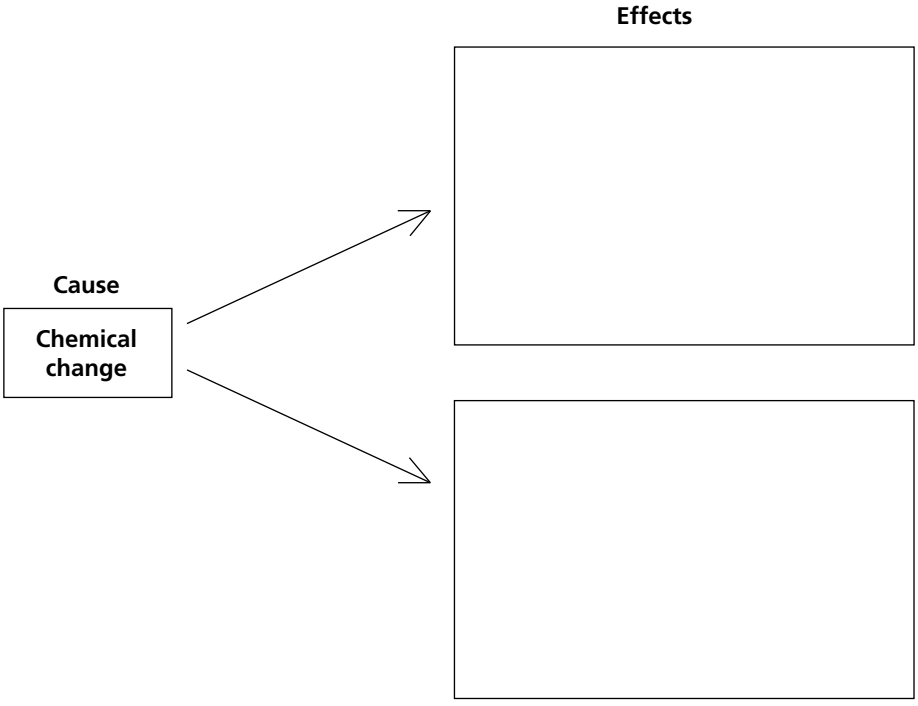
Name _____ Date _____ Class _____

Changes in Matter

This section describes physical and chemical changes in matter. It also explains how changes in matter are related to changes in energy.

Use Target Reading Skills

As you read, identify two effects caused by a chemical change. Then, complete the graphic organizer.



Physical Change

1. What is a physical change?

_____

_____

_____

2. Is the following sentence true or false? A substance that undergoes a physical change is a different substance with different properties after the change. _____

3. Circle the letter of each example of a physical change.
   - **a.** dissolving
   - **b.** burning
   - **c.** changing from a solid to a liquid
   - **d.** chopping

Changes in Matter *(continued)*

Chemical Change

4. What is a chemical change?

_____

_____

5. How does a chemical change differ from a physical change?

_____

_____

_____

6. Circle the letter of each example of a chemical change.

a. distillation
b. filtration
c. oxidation
d. electrolysis

7. The fact that matter is not created or destroyed in any change in matter is described by the _____.

Matter and Thermal Energy

8. The ability to do work is called _____.

9. Is the following sentence true or false? Every chemical or physical change in matter includes a change in energy.

_____

10. How does temperature differ from thermal energy?

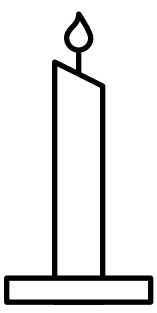
_____

_____

_____

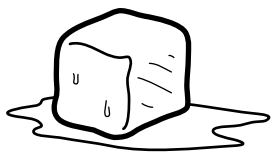
11. Classify the following as an endothermic or exothermic change.

a.



_____

b.



_____

Name _____ Date _____ Class _____

Changes in Matter

Understanding Main Ideas

Check the type of change or changes that apply to each description.

Description	Physical Change	Chemical Change
1. Occurs when energy is added or removed		
2. A new substance is produced.		
3. A substance changes form, but it remains the same substance.		
4. Freezing water is an example.		
5. Rusting metal is an example.		

6. Can energy be released when matter changes? Can it be absorbed? Can a change in matter take place in which energy is neither released nor absorbed?

_____

_____

_____

_____

Building Vocabulary

If the statement is true, write true. *If it is false, change the underlined word or words to make the statement true.*

____ **7.** The law of conservation of mass states that in any chemical or physical change, <u>energy</u> is not created or destroyed.

____ **8.** <u>Temperature</u> is the average energy of motion of particles of matter.

____ **9.** <u>Thermal energy</u> is the total energy of all particles in an object.

____ **10.** <u>Energy</u> is the ability to do work.

____ **11.** In an <u>endothermic change</u>, energy is released.

____ **12.** In an <u>exothermic change</u>, energy is absorbed.