



TEACHER GUIDE

- Assessment Rubric 4
- How Is Our Resource Organized? 5
- Bloom’s Taxonomy for Reading Comprehension 6
- Vocabulary 6

STUDENT HANDOUTS

- Reading Comprehension
 - 1. What Is Matter? 7
 - 2. Three States of Matter 7
 - 3. Physical Properties of Matter 7
 - 4. Physical Changes of Matter 7
 - 5. Physical Changes vs. Chemical Changes 7
 - 6. Chemical Changes and Chemical Properties 7
 - 7. Mixtures and Solutions 7
- Hands-on Activities 12
- Crossword 16
- Word Search 17
- Comprehension Quiz 18

EASY-MARKING™ ANSWER KEY 20

MINI POSTERS 22

FREE! 6 Bonus Activities!

3 EASY STEPS to receive your 6 Bonus Activities!

- Go to our website:
www.classroomcompletepress.com/bonus
- Click on item CC4504 – Properties of Matter
- Enter pass code CC4504D



Chemical Changes and Chemical Properties

1. Circle **T** if the statement is **TRUE** or **F** if it is **FALSE**.

- T F a) "Chemical reaction" means the same as "chemical change."
 T F b) Plants use chemical changes to make food.
 T F c) Only physical changes happen inside our bodies.
 T F d) Water combines with hydrogen to make oxygen.
 T F e) Chemical changes tell how and when a material can change into a new material.

2. Put a check mark next to the answer that is most correct.

- a) Which chemical change happens most slowly?
 A a nail rusting
 B bread baking
 C an egg cooking
 D a candle burning
- b) What gas do we breathe in that helps our bodies get energy from food?
 A hydrogen
 B oxygen
 C water vapor
 D carbon dioxide
- c) Which is a chemical property?
 A freezes at 32°F (0°C)
 B can be stretched
 C dissolves in water
 D able to burn



Chemical Changes and Chemical Properties

Many chemical changes happen in plants, too. The most important one for humans is when plants change carbon dioxide and water into food molecules and oxygen. We need the food to eat and the oxygen to breathe.



Name one way in which oxygen from the air reacts **SLOWLY** with another material. Name one way in which oxygen reacts **QUICKLY** with another material. Name one way in which oxygen reacts **EXPLOSIVELY** with another material.

Here is even another kind of chemical change: new materials are formed when large molecules break into smaller ones. Rotting is this kind of chemical change. For example, when dead leaves rot, molecules break apart into smaller molecules. Some of these molecules then go down into the soil and up through the roots to help make new leaves.

All of these kinds of chemical changes that can happen to a material are called the material's **chemical properties**. If a material can burn, it is **flammable**. If a material will not rust or rot, it is **rust resistant** or **rot resistant**. Materials that do not react at all chemically are called **inert**.

These are the four important things we have been reading about:

- Physical properties** tell how a material looks and acts as long it does not change into a new material.
- Physical changes** are the ways a material can change into a new form but still be the same material. Physical changes do *not* change the way atoms are stuck together in molecules.
- Chemical properties** tell how and when a material can change into a new material.
- Chemical changes** cause a new material to be formed. In chemical changes atoms *always* change the way they are stuck together to form molecules.



Chemical Changes and Chemical Properties

1. Circle the names of things that can react quickly with oxygen.

Underline the things that react slowly with oxygen.

Be careful—some of the materials do not react with oxygen at all.

- a glass bottle a copper penny
 dry firewood coal
 salt water gasoline
 an iron nail

2. The materials on the left are the materials before a chemical change. The materials on the right are materials after a chemical change. Draw an arrow from each material on the left to the one on the right that shows the before and after parts of each change.

carbon dioxide and water	carbon dioxide, only	A
hydrogen and oxygen	food molecules and oxygen	B
oxygen and iron	aluminum oxide	C
charcoal and oxygen	water and carbon dioxide	D
aluminum and oxygen	water, only	E
food molecules and oxygen	rust	F



Chemical Changes and Chemical Properties

3. What is the meaning of "chemical change?"

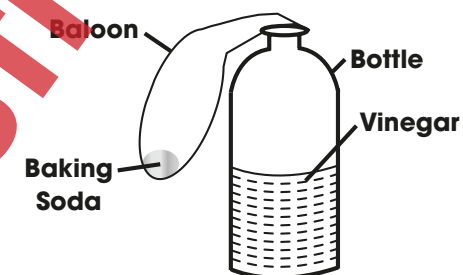
4. What is the meaning of "chemical property?"

Extensions & Applications

5. A Chemical Change

Baking soda and vinegar are things people use in cooking. The chemical name of baking soda is sodium hydrogen carbonate. Vinegar is a mixture of water and acetic acid.

For this experiment, you will need: baking soda, vinegar, a balloon, a bottle with a small top.



Steps:

- Add a half inch of water to the bottle. Add a half inch of vinegar to the bottle. Add one tablespoon of baking soda to the balloon.
- Stretch the balloon over the top of the bottle as shown below. Do not let any baking soda fall into the bottle while you are putting on the balloon.
- Tip the balloon up so that the baking soda falls into the bottle. Watch the chemical change. New materials formed are liquid water, the gas carbon dioxide, and sodium acetate. Sodium acetate is a solid that dissolves in water. **Where are each of the new materials that formed?**
- Remember that things need oxygen to burn. Remove the balloon and carefully put a burning match or birthday candle into the neck of the bottle. **Explain what happened to the match.**

Chemical Changes and Conservation of Mass

CONSERVATION OF MASS is one of the laws of science. "Conserved" means something stays the same. So this law says that no mass is lost or gained during a chemical change. This is also true of physical changes. You can do experiments to show that this is true.

Experiment 1

For the first experiment you will need a piece of fresh bread, a tablespoon of water and a container. You must be able to see through the container and be able to seal it very tightly. You will also need a scale or balance that can tell very small differences in weight. Ask your teacher if there is an "analytical balance" in your school. Ask if someone could weigh some things on for you.

Steps:

1. Put the bread and water in the container and seal it tightly.
2. Weigh the container with the bread and water in it.
3. Put the container in a sunny window or other warm place.
4. Wait until the bread is covered with mold. (Getting moldy is a chemical reaction.)
5. Weigh the container again.

Experiment 2

For the second experiment you will need a few small iron nails or some iron filings. The nails should be plain iron and not coated with anything. Iron filings will work better.

Steps:

1. Weigh the iron nails or filings carefully.
2. Put the nails or filings outside in a place where they will get sunlight and where dew and rain can get on them.
3. Wait until the iron is covered with rust. (Remember rusting is a chemical reaction.)
4. Bring the nails or filings inside. When you are sure they are dry, weight them again.

- A. Did the weight change in the first experiment?
- B. Did the weight change in the second experiment?
- C. If the results were different in the two experiments, explain the difference.
- D. Do you think mass was conserved in both experiments? Explain your answer.

Word Search

Find all of the words in the Word Search. Words are written horizontally, vertically, diagonally, and some are even written backwards.

A	B	V	O	L	U	M	E	R	T	D	H	W	X	G	H
D	C	B	C	X	D	P	Q	R	S	F	J	M	Y	J	K
E	F	P	D	L	I	O	B	S	U	F	O	R	C	E	W
H	G	R	F	G	U	D	T	D	R	I	D	T	Z	Y	R
I	J	O	P	A	Q	U	E	G	A	I	X	S	M	P	E
L	K	P	R	H	I	T	V	A	S	W	E	I	G	H	T
S	M	E	S	O	L	I	D	S	Z	Z	A	R	M	Y	T
N	E	R	J	E	T	N	O	X	E	A	K	E	B	S	A
O	P	T	M	K	M	L	W	E	R	U	P	Q	C	I	M
R	Q	Y	T	I	V	A	R	G	B	A	L	P	D	C	X
S	T	X	Y	E	L	F	S	C	H	E	M	I	C	A	L
V	U	W	Z	A	L	M	X	S	C	G	M	N	F	L	Y

atom

boil

chemical

dissolve

force

freeze

gas

mass

gravity

liquid

matter

melt

mixture

opaque

oxide

volume

physical

property

pure

rot

rust

shape

solids

weight

Comprehension Quiz

Part A

Circle **T** if the statement is TRUE or **F** if it is FALSE.

- T F** 1) Mass is a property of matter.
- T F** 2) Atoms and particles are two kinds of molecules.
- T F** 3) When water boils, it changes into a new material.
- T F** 4) You would have less weight on the moon than you do on Earth.
- T F** 5) Smashing a pumpkin is a chemical change.
- T F** 6) When salt dissolves in water, it forms a mixture.
- T F** 7) Chemical changes cause atoms to fasten together a different way.

Part B

Put a check mark next to the answer that is most correct.

- 1) When water changes from a gas to a liquid it is called
 - A boiling
 - B condensation
 - C evaporation
 - D freezing
- 2) Which is a property of glass?
 - A It is soluble
 - B it is opaque
 - C it is flammable
 - D it is transparent
- 3) Which tool could be used to separate sugar from water?
 - A a screen
 - B a refrigerator
 - C a kitchen stove
 - D a bucket of water

SUBTOTAL: /10

Mass and Weight On the Earth and the Moon

Earth

Weight = 120 pounds

Moonscape

Weight = 20 pounds

NAME: _____

After You Read 



Chemical Changes and Chemical Properties

3. What is the meaning of "chemical change?"

4. What is the meaning of "chemical property?"

Extensions & Applications

5. A Chemical Change

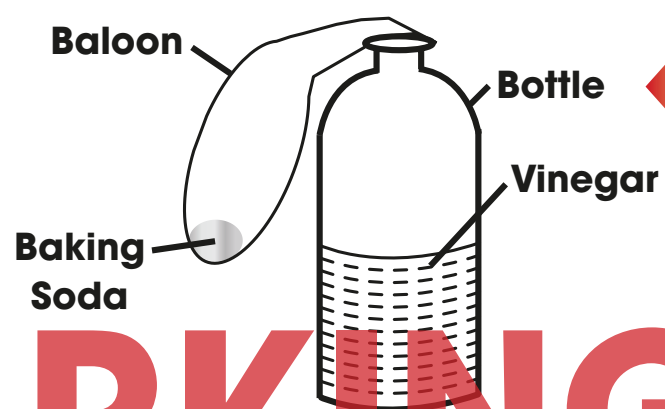
Baking soda and vinegar are things people use in cooking. The chemical name of baking soda is sodium hydrogen carbonate. Vinegar is a mixture of water and acetic acid.

For this experiment, you will need:

baking soda vinegar a balloon a bottle with a small top

Steps:

1. Add a half inch of water to the bottle. Add a half inch of vinegar to the bottle. Add one tablespoon of baking soda to the balloon.
2. Stretch the balloon over the top of the bottle as shown below. Do not let any baking soda fall into the bottle while you are putting on the balloon.
3. Tip the balloon up so that the baking soda falls into the bottle. Watch the chemical change. New materials formed are liquid water, the gas carbon dioxide, and sodium acetate. Sodium acetate is a solid that dissolves in water. **Where are each of the new materials that formed?**
4. Remember that things need oxygen to burn. Remove the balloon and carefully put a burning match or birthday candle into the neck of the bottle. **Explain what happened to the match.**



3. Accept one of:

A change that forms a new material
OR
A change that causes atoms to be attached in a new way

Answers will vary

12

4. Possible answer:

Tells how or when a material will change to form a new material

3. Carbon dioxide is in the balloon. Water is in the bottom of the bottle, and sodium acetate is dissolved in the water.

Step 4:

The match went out because there was no oxygen in the bottle, only carbon dioxide.

A. No

B. Yes

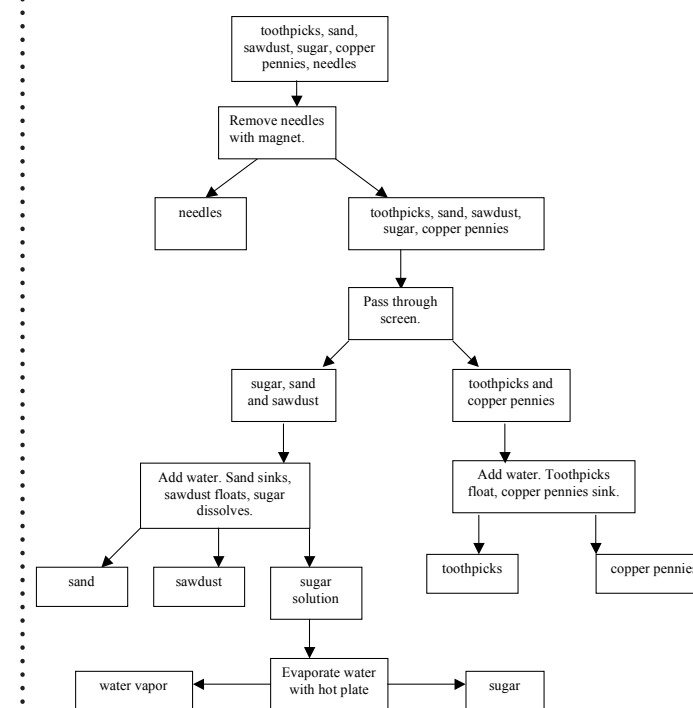
C. No matter could enter or leave in the first experiment. In the second experiment, no iron left, but oxygen from the air combined with the iron and added to the mass.

D. Yes, because the mass gained by the rusting iron equaled the mass lost by the air.

11

13

14



EASY MARKING ANSWER KEY