

Name: \_\_\_\_\_

Date: \_\_\_\_\_



# GENIUSCHALLENGE

## CHEMICAL VS. PHYSICAL CHANGES

1. If two substances are mixed and a new substance is formed, what type of change is it?  
\_\_\_\_\_

2. Placing the spoon in hot water was a physical change since the melted metal was still...  
a. gallium      b. iron      c. steel      d. aluminum

3. When a substance changes states (melts, evaporates, etc.) it is often what type of change?  
\_\_\_\_\_

4. Fill in the blank using physical change or chemical change.  
When something burns, it is a \_\_\_\_\_

5. True or false: since gas is detected during the candy + soda demo, it is an example of a chemical change.  
\_\_\_\_\_

6. What is the evidence that the gas made in the mentos + soda demo was carbon dioxide?  
\_\_\_\_\_

7. Which of these is the most reliable way to see if a new gas has formed?  
a. Fill up a balloon      b. Flame test      c. Measure temperature      d. Look at it

8. How does hydrogen react in a flame test? \_\_\_\_\_

9. Milk spoiling is an example of which type of change? \_\_\_\_\_

10. What type of change is mixing air into egg whites to make frosting? \_\_\_\_\_

# PHYSICAL AND CHEMICAL PROPERTIES AND CHANGES

Name \_\_\_\_\_ Key \_\_\_\_\_

## PHYSICAL PROPERTY

1. observed with senses
2. determined without destroying matter

## CHEMICAL PROPERTY

1. indicates how a substance reacts with something else
2. matter will be changed into a new substance after the reaction

Identify the following as a chemical (C) or physical property (P):

- |                                 |                            |
|---------------------------------|----------------------------|
| _____ 1. blue color             | _____ 8. melting point     |
| _____ 2. density                | _____ 9. reacts with water |
| _____ 3. flammability (burns)   | _____ 10. hardness         |
| _____ 4. solubility (dissolves) | _____ 11. boiling point    |
| _____ 5. reacts with acid       | _____ 12. luster           |
| _____ 6. supports combustion    | _____ 13. odor             |
| _____ 7. sour taste             | _____ 14. reacts with air  |

## PHYSICAL CHANGE

1. a change in size, shape, or state
2. no new substance is formed

## CHEMICAL CHANGE

1. a change in the physical and chemical properties
2. a new substance is formed

Identify the following as physical (P) or chemical (C) changes.

- |                                                  |                                      |
|--------------------------------------------------|--------------------------------------|
| _____ 1. NaCl (Table Salt) dissolves in water.   | _____ 9. Milk sours.                 |
| _____ 2. Ag (Silver) tarnishes.                  | _____ 10. Sugar dissolves in water.  |
| _____ 3. An apple is cut.                        | _____ 11. Wood rots.                 |
| _____ 4. Heat changes H <sub>2</sub> O to steam. | _____ 12. Pancakes cook.             |
| _____ 5. Baking soda reacts to vinegar.          | _____ 13. Grass grows.               |
| _____ 6. Fe (Iron) rusts.                        | _____ 14. A tire is inflated.        |
| _____ 7. Alcohol evaporates .                    | _____ 15. Food is digested.          |
| _____ 8. Ice melts.                              | _____ 16. Paper towel absorbs water. |

## Physical and Chemical Changes

### Part A

Can you recognize the chemical and physical changes that happen all around us? If you change the way something looks, but haven't made a new substance, a **physical change** (P) has occurred. If the substance has been changed into another substance, a **chemical change** (C) has occurred.

1.	An ice cube is placed in the sun. Later there is a puddle of water. Later still the puddle is gone.
2.	Two chemicals are mixed together and a gas is produced.
3.	A bicycle changes color as it rusts.
4.	A solid is crushed to a powder.
5.	Two substances are mixed and light is produced.
6.	A piece of ice melts and reacts with sodium.
7.	Mixing salt and pepper.
8.	Chocolate syrup is dissolved in milk.
9.	A marshmallow is toasted over a campfire.
10.	A marshmallow is cut in half.

**Part B**

Read each scenario. Decide whether a physical or chemical change has occurred and give evidence for your decision. The first one has been done for you to use as an example.

	Scenario	Physical or Chemical Change?	Evidence...
1.	Umm! A student removes a loaf of bread hot from the oven. The student cuts a slice off the loaf and spreads butter on it.		
2.	Your friend decides to toast a piece of bread, but leaves it in the toaster too long. The bread is black and the kitchen is full of smoke.		
3.	You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it.		
4.	You blow dry your wet hair.		
5.	In baking biscuits and other quick breads, the baking powder reacts to release carbon dioxide bubbles. The carbon dioxide bubbles cause the dough to rise.		
6.	You take out your best silver spoons and notice that they are very dull and have some black spots.		
7.	A straight piece of wire is coiled to form a spring.		
8.	Food color is dropped into water to give it color.		
9.	Chewing food to break it down into smaller particles represents a _____ change, but the changing of starch into sugars by enzymes in the digestive system represents a _____ change.		
10.	In a fireworks show, the fireworks explode giving off heat and light.		

**Part C: True (T) or False (F)**

1.	Changing the size and shapes of pieces of wood would be a chemical change.
2.	In a physical change, the makeup of matter is changed.
3.	Evaporation occurs when liquid water changes into a gas.
4.	Evaporation is a physical change.
5.	Burning wood is a physical change.
6.	Combining hydrogen and oxygen to make water is a physical change.
7.	Breaking up concrete is a physical change.
8.	Sand being washed out to sea from the beach is a chemical change.
9.	When ice cream melts, a chemical change occurs.
10.	Acid rain damaging a marble statue is a physical change.