

# 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.

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## PHYSICAL PROPERTY

- observed with senses
- determined without destroying matter

## CHEMICAL PROPERTY

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

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

- |                            |                           |                            |                      |
|----------------------------|---------------------------|----------------------------|----------------------|
| <input type="checkbox"/> P | 1. blue color             | <input type="checkbox"/> P | 8. melting point     |
| <input type="checkbox"/> P | 2. density                | <input type="checkbox"/> C | 9. reacts with water |
| <input type="checkbox"/> C | 3. flammability (burns)   | <input type="checkbox"/> P | 10. hardness         |
| <input type="checkbox"/> P | 4. solubility (dissolves) | <input type="checkbox"/> P | 11. boiling point    |
| <input type="checkbox"/> C | 5. reacts with acid       | <input type="checkbox"/> P | 12. luster           |
| <input type="checkbox"/> C | 6. supports combustion    | <input type="checkbox"/> P | 13. odor             |
| <input type="checkbox"/> P | 7. sour taste             | <input type="checkbox"/> C | 14. reacts with air  |

## PHYSICAL CHANGE

- a change in size, shape, or state
- no new substance is formed

## CHEMICAL CHANGE

- a change in the physical and chemical properties
- a new substance is formed

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

- |                            |  |                            |                                |
|----------------------------|--|----------------------------|--------------------------------|
| <input type="checkbox"/> P | 1. NaCl (Table Salt) dissolves in water.   | <input type="checkbox"/> C | 9. Milk sours.                 |
| <input type="checkbox"/> C | 2. Ag (Silver) tarnishes.                  | <input type="checkbox"/> P | 10. Sugar dissolves in water.  |
| <input type="checkbox"/> P | 3. An apple is cut.                        | <input type="checkbox"/> C | 11. Wood rots.                 |
| <input type="checkbox"/> P | 4. Heat changes H <sub>2</sub> O to steam. | <input type="checkbox"/> C | 12. Pancakes cook.             |
| <input type="checkbox"/> C | 5. Baking soda reacts to vinegar.          | <input type="checkbox"/> C | 13. Grass grows.               |
| <input type="checkbox"/> C | 6. Fe (Iron) rusts.                        | <input type="checkbox"/> P | 14. A tire is inflated.        |
| <input type="checkbox"/> P | 7. Alcohol evaporates.                     | <input type="checkbox"/> C | 15. Food is digested.          |
| <input type="checkbox"/> P | 8. Ice melts.                              | <input type="checkbox"/> P | 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.	P	An ice cube is placed in the sun. Later there is a puddle of water. Later still the puddle is gone.
2.	C	Two chemicals are mixed together and a gas is produced.
3.	C	A bicycle changes color as it rusts.
4.	P	A solid is crushed to a powder.
5.	C	Two substances are mixed and light is produced.
6.	PC	A piece of ice melts and reacts with sodium.
7.	P	Mixing salt and pepper.
8.	P	Chocolate syrup is dissolved in milk.
9.	C	A marshmallow is toasted over a campfire.
10.	P	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.	Physical	No change in substances. No unexpected color change, temperature change or gas given off.
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.	Chemical	Identity of substances change. Blackening of bread and smoke is the new substance
3.	You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it.	Chemical	Identity of substances change. Iron of knife forms rust
4.	You blow dry your wet hair.	Physical	No change in substances. No unexpected color change, temperature change or gas given off.
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.	Chemical	Identity of substances change. Gas is produced
6.	You take out your best silver spoons and notice that they are very dull and have some black spots.	Chemical	Identity of substances change. Silver oxide produced
7.	A straight piece of wire is coiled to form a spring.	Physical	No change in substances. No unexpected color change, temperature change or gas given off.
8.	Food color is dropped into water to give it color.	Physical	No change in substances. No unexpected color change, temperature change or gas given off.
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.	Physical then Chemical	Chewing breaks down matter into smaller particles of the same substance. Enzymes change starch into sugar which is a new substance.
10.	In a fireworks show, the fireworks explode giving off heat and light.	Chemical	Identity of substances change. Fireworks combust making new products and energy.

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

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

