

PHYSICAL AND CHEMICAL PROPERTIES AND CHANGES

Name KEY

PHYSICAL PROPERTY	CHEMICAL PROPERTY
1. observed with senses	1. indicates how a substance reacts with something else
2. determined without destroying matter	2. matter will be changed into a new substance after the reaction

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

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

PHYSICAL CHANGE	CHEMICAL CHANGE
1. a change in size, shape, or state	1. a change in the physical and chemical properties
2. no new substance is formed	2. a new substance is formed

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

- | | |
|---|--|
| <u>P</u> 1. NaCl (Table Salt) dissolves in water. | <u>C</u> 9. Milk sours. |
| <u>C</u> 2. Ag (Silver) tarnishes. | <u>P</u> 10. Sugar dissolves in water. |
| <u>P</u> 3. An apple is cut. | <u>C</u> 11. Wood rots. |
| <u>P</u> 4. Heat changes H ₂ O to steam. | <u>C</u> 12. Pancakes cook. |
| <u>C</u> 5. Baking soda reacts to vinegar. | <u>C</u> 13. Grass grows. → FROM ITS METABOLISM - <u>CHEM!</u> |
| <u>C</u> 6. Fe (Iron) rusts. | <u>P</u> 14. A tire is inflated. |
| <u>P</u> 7. Alcohol evaporates. | <u>C</u> 15. Food is digested. |
| <u>P</u> 8. Ice melts. | <u>P</u> 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.	<u>P</u>	An ice cube is placed in the sun. Later there is a puddle of water. Later still the puddle is gone.
2.	<u>C</u>	Two chemicals are mixed together and a <u>gas is produced</u> .
3.	<u>C</u>	A bicycle changes color as it <u>rusts</u> .
4.	<u>P</u>	A solid is crushed to a powder.
5.	<u>C</u>	Two substances are mixed and <u>light is produced</u> .
6.	<u>C</u>	A piece of ice melts and <u>reacts with sodium</u> . (MELTING = PHYS.)
7.	<u>P</u>	Mixing salt and pepper.
8.	<u>P</u>	Chocolate syrup is dissolved in milk.
9.	<u>C</u>	A marshmallow is <u>toasted</u> over a campfire. - <u>COOKING</u>
10.	<u>P</u>	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	BLACK - SIGN COOKING/ BURNING HAS OCCURRED; SMOKE - FROM COMBUSTION
3.	You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it.	CHEM	RED SPOTS ON METAL - RUSTING - IS A CHEM. REACTION
4.	You blow dry your wet hair.	PHYS	H ₂ O IN HAIR VAPORIZES TO H ₂ O VAPOR. NO CHANGE IN SUBST.
5.	In baking biscuits and other quick breads, the baking powder <u>reacts</u> to release carbon dioxide bubbles. The carbon dioxide bubbles cause the dough to rise.	CHEM	BUBBLES - SIGN OF NEW GAS
6.	You take out your best silver spoons and notice that they are very dull and have some black spots.	CHEM	BLACK SPOTS - FROM TARNISHING - A CHEM REACTION.
7.	A straight piece of wire is coiled to form a spring.	PHYS	NO CHANGE TO SUBSTANCE BESIDES SHAPE, WHICH IS A PHYS. PROP.
8.	Food color is dropped into water to give it color.	PHYS	FOOD COLOR DISSOLVES TO CHANGE H ₂ O COLOR - DISSOLVING IS PHYS.
9.	Chewing food to break it down into smaller particles represents a <u>PHYS</u> change, but the changing of starch into sugars by enzymes in the digestive system represents a <u>CHEM</u> change.	PHYS, CHEM	• CHEWING - ONLY CHANGES SIZE - A PHYS. PROPERTY • DIGESTION - CHANGES CHEMICAL COMPOSITION OF FOOD
10.	In a fireworks show, the fireworks explode giving off heat and light.	CHEM	EXPLOSION, HEAT, LIGHT

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

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