

PHYSICAL AND CHEMICAL PROPERTIES AND CHANGES

PHYSICAL PROPERTY

1. observed with senses
2. determined without changing 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):

- P 1. blue color
P 2. density
C 3. flammability (burns)
P 4. solubility (dissolves)
C 5. reacts with acid
P 6. brittleness
P 7. sour taste

- P 8. melting point
C 9. reacts with water
P 10. hardness
P 11. boiling point
P 12. luster
P 13. odor
C 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.

- P 1. NaCl (Table Salt) dissolves in water.
C 2. Ag (Silver) tarnishes.
P 3. An apple is cut.
P 4. Heat changes H₂O to steam.
C 5. Baking soda reacts to vinegar.
C 6. Fe (Iron) rusts.
P 7. Alcohol evaporates .
P 8. Ice melts.

- C 9. Milk sours.
P 10. Sugar dissolves in water.
C 11. Wood rots.
C 12. Pancakes cook.
P 13. Grass grows.
P 14. A tire is inflated.
C 15. Food is digested.
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 chemical are mixed together and a gas is produce.
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.	P + C	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 if full of smoke.	CHEMICAL	New black color and solid, gas is produced. (The black is actually pure carbon)
3.	You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it.	CHEMICAL	New color and if left long enough you will see that the new color is also a new solid.

4.	You blow dry your wet hair.	PHYSICAL	Water evaporates only.
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	A new gas is produced which makes the biscuits rise.
6.	You take out your best silver spoons and notice that they are very dull and have some black spots.	CHEMICAL	New color and if left long enough you will see that the new color is also a new solid.
7.	A straight piece of wire is coiled to form a spring.	PHYSICAL	Only a change of shape, no new substance is made.
8.	Food color is dropped into water to give it color.	PHYSICAL	Only a change in size from powder to particles to small to see.
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 CHEMICAL	First the teeth just make a change in size, and then the enzymes make a chemical change producing new molecules. Our temperature goes up while we digest from the energy released.
10.	In a fireworks show, the fireworks explode giving off heat and light.	CHEMICAL	Substances giving off heat and light, themselves, is always chemical. What we see in the sky are new colors and 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.