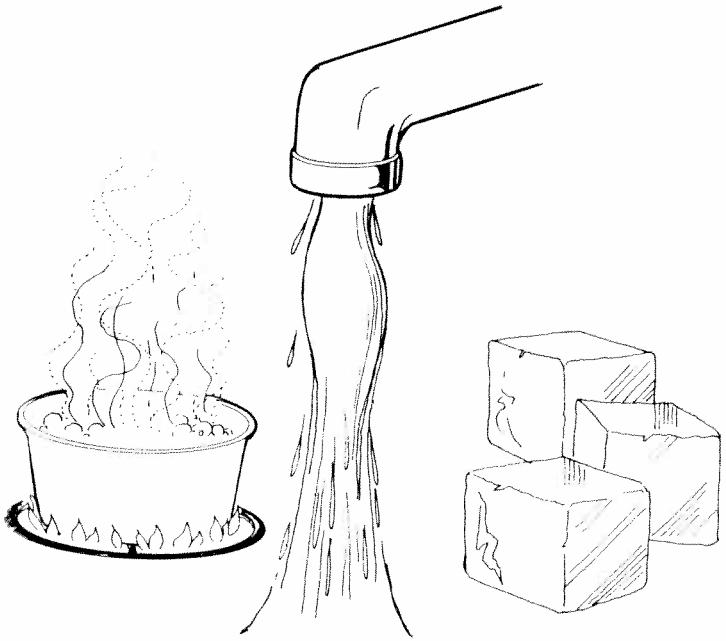
PHYSICAL VS. CHEMICAL CHANGE

Name KEY



In a physical change, the original substance still exists, it has only changed in form. Energy changes usually do not accompany physical changes, except in phase changes and when substances dissolve.

In a chemical change, a new substance is produced. Energy changes always accompany chemical changes. Chemical changes are always accompanied by physical changes.

Classify the following as examples of a physical change, a chemical change or both kinds of change.

1. Sodium hydroxide dissolves in water. — P
2. Hydrochloric acid reacts with sodium hydroxide to produce a salt, water and heat. — C
3. A pellet of sodium is sliced in two. — P
4. Water is heated and changed to steam. — P
5. Potassium chlorate decomposes to potassium chloride and oxygen gas. — C
6. Iron rusts. — C
7. Ice melts. — P
8. Acid on limestone produces carbon dioxide gas. — C
9. Milk sours. — C
10. Wood rots. — C

PHYSICAL VS. CHEMICAL PROPERTIES

Name _____

A physical property is observed with the senses and can be determined without destroying the object. For example, color, shape, mass, length, density, specific heat and odor are all examples of physical properties.

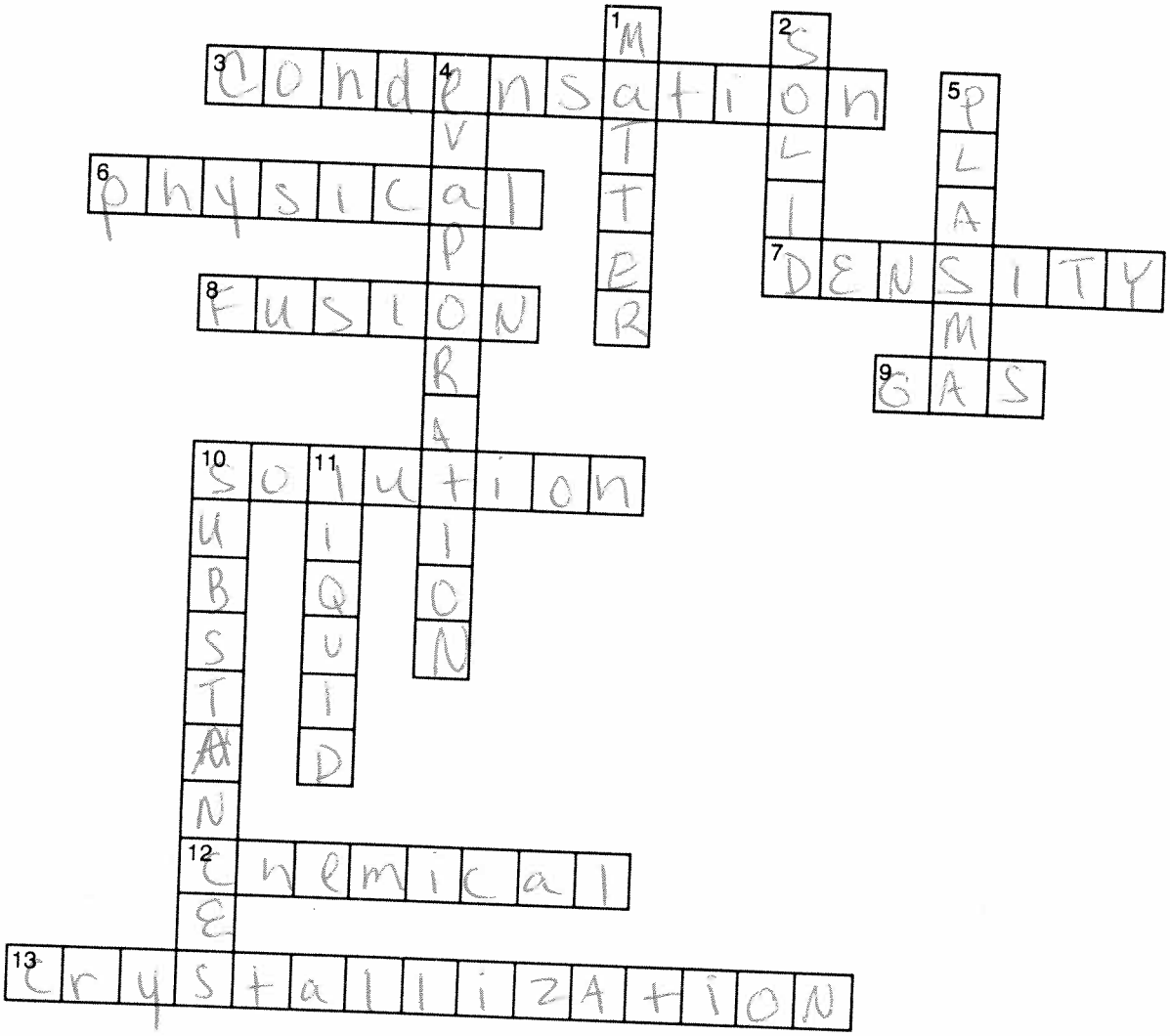
A chemical property indicates how a substance reacts with something else. When a chemical property is observed, the original substance is changed into a different substance. For example, the ability of iron to rust is a chemical property. The iron has reacted with oxygen and the original iron metal is gone. It is now iron oxide, a new substance. All chemical changes include physical changes.

Classify the following properties as either chemical or physical by putting a check in the appropriate column.

	Physical Property	Chemical Property
1. red color	✓	
2. density	✓	
3. flammability		✓
4. solubility	✓	
5. reacts with acid to form hydrogen		✓
6. supports combustion		✓
7. bitter taste	✓	
8. melting point	✓	
9. reacts with water to form a gas		✓
10. reacts with a base to form water		✓
11. hardness	✓	
12. boiling point	✓	
13. can neutralize a base		✓
14. luster	✓	
15. odor	✓	

STATES OF MATTER CROSSWORD

Name KEY



ACROSS

3. Change of a gas to a liquid
6. This type of property can be observed without destroying the substance.
7. Mass of a substance divided by unit volume
8. Physical change of a solid to a liquid at the melting point
9. State of matter having no definite volume or shape
10. Homogeneous mixture
12. This type of change produces a new substance.
13. Change of a liquid to a solid

DOWN

1. Anything that has mass and takes up space
2. State in which atoms or molecules are very close together and are regularly arranged
4. Change of a liquid to a gas
5. This state of matter consists of electrically charged particles.
10. Elements and compounds
11. State of matter having a definite volume but no definite shape.

SEPARATION OF MIXTURES

Name _____

Taking advantage of various physical and chemical properties, how would you separa the following mixtures into their components?

1. Sand and water filter out the sand, or evaporate off the water

2. Sugar and water evaporate off the water

3. Oil and water allow them to separate due to different densities, then skim off the oil on top

4. Sand and gravel use a sieve to strain out particles of larger size

5. A mixture of heptane (boiling point 98°C) and heptanol (boiling point 176°C) Heat to 98°C, allowing heptane to boil off. This can be contained & condensed. Heptanol remains liq

6. A mixture of iodine solid and sodium chloride (Hint: Iodine is not soluble in water.) Mix with water. NaCl will dissolve and Iodine will not. Filter out Iodine. The Sodium chloride can then be recovered thru evaporation

7. A mixture of lead and aluminum pellets Separate them by hand on their appearance or shake them in water and allow them to settle in different layers due to densities

8. A mixture of salt and iron filings Fe filings can be separated out by a magnet