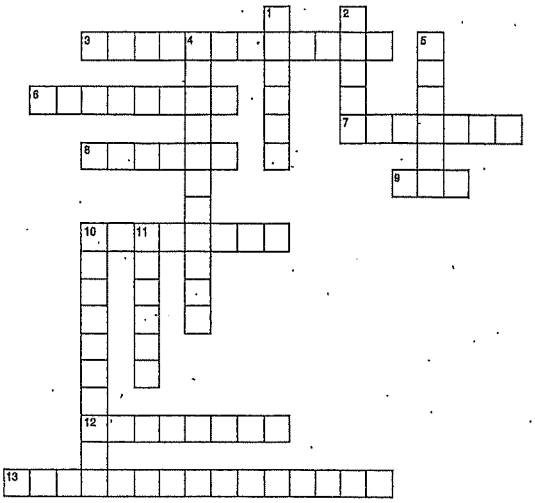
STATES OF MATTER CROSSWORD

Name _____



ACROSS

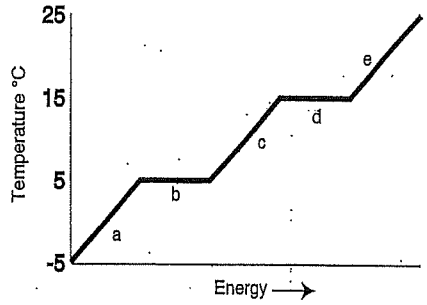
3. Change of a gas to a liquid
6. This type of property can be observed without destroying the substance.
7. Mass of a substance divided by unit volume
8. Physical change of a solid to a liquid at the melting point
9. State of matter having no definite volume or shape
10. Homogeneous mixture
12. This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

FREEZING AND BOILING POINT GRAPH

Name _____



Answer the following questions using the chart above.

1. What is the freezing point of the substance? _____
2. What is the boiling point of the substance? _____
3. What is the melting point of the substance? _____
4. What letter represents the range where the solid is being warmed? _____
5. What letter represents the range where the liquid is being warmed? _____
6. What letter represents the range where the vapor is being warmed? _____
7. What letter represents the melting of the solid? _____
8. What letter represents the vaporization of the liquid? _____
9. What letter(s) shows a change in potential energy? _____
10. What letter(s) shows a change in kinetic energy? _____
11. What letter represents condensation? _____
12. What letter represents crystallization? _____

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 and odor are all examples of physical properties.

A chemical property indicates how a substance reacts with something else. The original substance is fundamentally changed in observing a chemical property. For example, the ability of iron to rust is a chemical property. The iron has reacted with oxygen, and the original iron metal is changed. It now exists as iron oxide, a different substance.

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

	Physical Property	Chemical Property
1. blue color		
2. density		
3. flammability		
4. solubility		
5. reacts with acid to form H_2		
6. supports combustion		
7. sour 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		

PHYSICAL VS. CHEMICAL CHANGES

Name _____

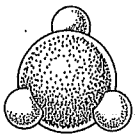
In a physical change, the original substance still exists, it has only changed in form. In a chemical change, a new substance is produced. Energy changes always accompany chemical changes.

Classify the following as being a physical or chemical change.

1. Sodium hydroxide dissolves in water. _____
2. Hydrochloric acid reacts with potassium hydroxide to produce a salt, water and heat. _____
3. A pellet of sodium is sliced in two. _____
4. Water is heated and changed to steam. _____
5. Potassium chlorate decomposes to potassium chloride and oxygen gas. _____
6. Iron rusts. _____
7. When placed in H_2O, a sodium pellet catches on fire as hydrogen gas is liberated and sodium hydroxide forms. _____
8. Evaporation _____
9. Ice melting _____
10. Milk sours. _____
11. Sugar dissolves in water. _____
12. Wood rotting _____
13. Pancakes cooking on a griddle _____
14. Grass growing in a lawn _____
15. A tire is inflated with air. _____
16. Food is digested in the stomach. _____
17. Water is absorbed by a paper towel. _____

SUBSTANCES VS. MIXTURES

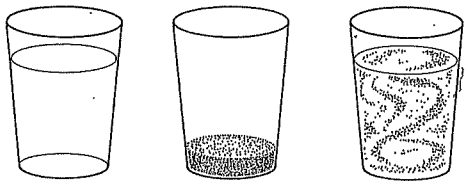
Name _____



A substance is matter for which a chemical formula can be written. Elements and compounds are substances. Mixtures can be in any proportion, and the parts are not chemically bonded.

Classify the following as to whether it is a substance or a mixture by writing S or M in the space provided.

1. sodium _____
2. water _____
3. soil _____
4. coffee _____
5. oxygen _____
6. alcohol _____
7. carbon dioxide _____
8. cake batter _____
9. air _____
10. soup _____
11. iron _____
12. salt water _____
13. ice cream _____
14. nitrogen _____
15. eggs _____
16. blood _____
17. table salt _____
18. nail polish _____
19. milk _____
20. cola _____



HOMOGENEOUS VS. HETEROGENEOUS MATTER

Name _____

Classify the following substances and mixtures as either homogeneous or heterogeneous. Place a √ in the correct column.

	HOMOGENEOUS	HETEROGENEOUS
1. flat soda pop		
2. cherry vanilla ice cream		
3. salad dressing		
4. sugar		
5. soil		
6. aluminum foil		
7. black coffee		
8. sugar water		
9. city air		
10. paint		
11. alcohol		
12. iron		
13. beach sand		
14. pure air		
15. spaghetti sauce		

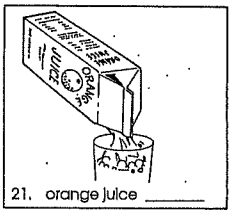
ELEMENTS, COMPOUNDS AND MIXTURES

Name _____

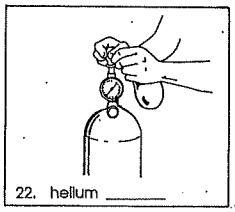
An element consists of only one kind of atom. A compound consists of two or more different elements chemically combined in a fixed ratio. The components of a mixture can be in any proportion and are not chemically bound.

Classify each of the following as an element, compound or mixture by writing E, C or M in the space provided.

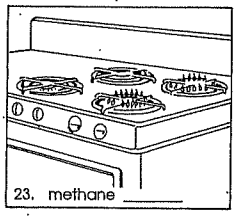
1. sodium _____
2. water _____
3. soil _____
4. coffee _____
5. oxygen _____
6. alcohol _____
7. carbon dioxide _____
8. cake batter _____
9. air _____
10. soap _____
11. iron _____
12. salt water _____
13. ice cream _____
14. nitrogen _____
15. eggs _____
16. blood _____
17. table salt _____
18. nail polish _____
19. milk _____
20. cola _____



21. orange juice _____



22. helium _____



23. methane _____

SEPARATION OF MIXTURES

Name _____

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

1. Sand and water _____
2. Sugar and water _____
3. Oil and water _____
4. Sand and gravel _____
5. A mixture of heptane (boiling point 98°C) and heptanol (boiling point 176°C)
6. A mixture of iodine solid and sodium chloride (Hint: Iodine is not soluble in water.)
7. A mixture of lead and aluminum pellets _____
8. A mixture of salt and iron filings _____