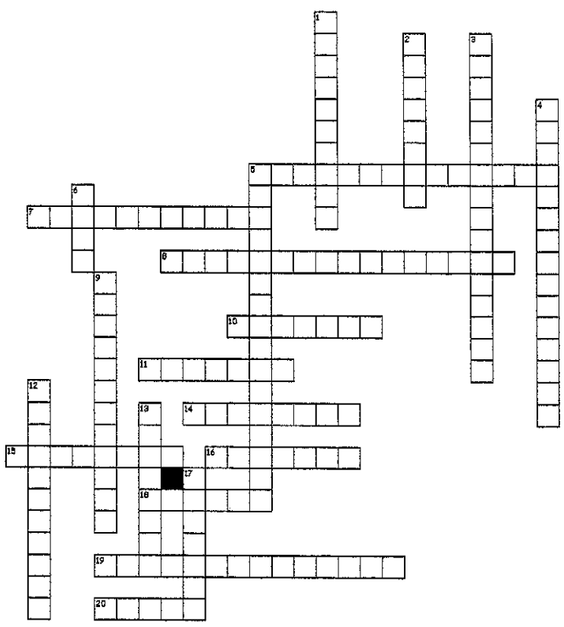
The Study of Matter



Across

5. The change of one or more substances into other substances.
7. An observation made without measurement.
8. Another term for chemical change.
10. A substance that cannot be broken down into simpler substances.
11. A combination of two or more substances in which the basic identity of each substance is not changed.
14. A chemical combination of two or more different elements joined together in a fixed proportion.
15. A mixture that is the same throughout or homogeneous.
16. A combination of chemical symbols that show what elements make up a compound and the number of atoms of each element.
18. The capacity to do work.
19. A change in matter where its identity does not change.
20. A solid solution containing different metals, and sometimes nonmetallic substances.

Down

1. Chemical reaction that gives off energy.
2. Description of a substance that easily changes to a gas at room temperature.
3. A characteristic of matter that is exhibited without a change in identity.
4. Solution in which the solvent is water.
5. A property that can be observed only when there is a change in the composition of a substance.
6. The measure of the amount of matter an object contains.
9. An observation made with measurement.
12. Chemical reaction that absorbs energy.
13. The characteristics of matter; how it behaves.
17. The amount of matter (mass) in a given unit volume.

Home

Station 1: Physical Properties – Specific Heat

For questions 1-8, match the following vocabulary terms with the correct definition.

A. Diluted
B. Concentrated
C. Solute
D. Solvent
E. Solubility
F. Density
G. Melting point
H. Boiling point

_____1. A measure of how much of a substance dissolves in a given amount of another substance.
_____2. A solution that has more solvent than solute.
_____3. A substance that is being dissolved in another substance.

_____4. A substance that actually does the dissolving.
_____5. The temperature at which a liquid changes to a gas.
_____6. A solution that has more solute than solvent.

_____7. The temperature at which a solid changes to a liquid.
_____8. A physical property that measures the amount of mass per volume.

9. Circle the correct answer in each parenthesis.
A substance with a (HIGH/LOW) specific heat changes temperature *quickly with a little bit of energy*. A substance with a (HIGH/LOW) specific heat takes *a longer time and more energy to change temperature.*

10. Ms. Freiheit wants to boil a pot of water to make pasta. She also needs to freeze some water to make ice to put in her glass of water. She notices that it takes a lot of energy to change the temperature of water, which means that water has a (HIGH / LOW) specific heat.

Station 2: Physical Properties - Density

Use the table below to answer questions 11-12.

Substance	Melting point (°C)	Boiling Point (°C)
Water	0	100
Salt water	-2	102
Mercury	-39	357

11. At what temperature will mercury become a liquid? _____
12. What state of matter is salt water at 150°C? _____

Use the table below to answer questions 13-15

Material	**Density (g/cm^3)**
Gold	19.3 g/cm^3
Pyrite	5.0 g/cm^3
Water	1.0 g/cm^3
Galena	7.5 g/cm^3

13. Of the above materials, which of the following would float in water?
a. Gold
b. Pyrite
c. Galena
d. None of the above

Explain why: _____
_____

14. I have a necklace, but I don't know what it's made of. I found the density of my necklace is 19.3 g/cm^3. Which material was my necklace made of? _____

15. Which scenario will most likely cause water to dissolve more of a solute?

a. decreasing the surface area of the solid
b. decreasing the temperature of the water
c. increasing the temperature of the water
d. increasing the amount of water

Name: _____ Date: _____

Mini-Quiz 8.P.1.3 & 8.P.1.4

Objective: Physical vs. Chemical Change

1. What are correct four signs that show a *chemical change* has occurred when substances combine to form one or more new substances?
   A. Color change, freeze, heat & light, and precipitate
   B. Precipitate, color change, heat & light, and release of gas
   C. Release of gas, color change, heat & light, and melting

2. Which is an example of a *physical change*?
   A. Boiling
   B. Burning
   C. Rotting
   D. Rusting

3. Which is **not** an example of a *chemical change* of a substance?
   A. Burning coal
   B. Salt dissolving in water
   C. Rusting of metal
   D. Corroding (rusting) of silver

4. A lab student places some sodium hydroxide solution into a test tube and adds a drop of phenolphthalein solution to it. Both sodium hydroxide and phenolphthalein are colorless, yet when *mixed together*, the **solution turns pink**. What has occurred?
   A. a heterogeneous mixture
   B. a chemical change
   C. the formation of a solid
   D. a physical change

5. Taylor investigated the effects of hydrochloric acid on several solid substances. The results recorded below are her observations of the effect of hydrochloric acid on a sample of calcium carbonate.

After placing one drop of HCl on a sample of $CaCO_3$, bubbles formed. Once the bubbles stopped, a clear liquid and a white solid remained on the surface of the sample.

What type of change occurred to the substances in her investigation?
   A. a chemical change
   B. a gradual change
   C. a physical change
   D. a temporary change

Read the following examples. Identify if the example is a physical change or chemical change on the line provided.

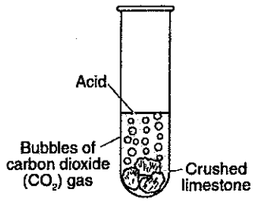
*Write **P** for physical and **C** for chemical .**Write the sign or observation in second blank (how do you know?)***

1. _____ wadding up your paper and throwing it across the room _____
2. _____ Gasoline combustion in a car _____
3. _____ Ice cream melting _____
4. _____ sweat evaporating from your forehead _____
5. _____ freezing water to make ice cubes _____
6. _____ frying an egg _____
7. _____ lighting a match _____
8. _____ Boiling water _____
9. _____ mowing the grass _____
10. _____ digesting food _____
11. _____ burning leaves _____
12. _____ bleaching your hair _____
13. _____ fireworks exploding _____
14. _____ a rusting bicycle _____

Exit ticket

1. **Which is an example of a physical change?**

   A) Wood burning
   B) Iron rusting
   C) Ice melting
   D) Milk souring



3. **List one observation that a chemical change is taking place.**

_____

2. **Which is an example of a chemical change?**

   A) Wood burning
   B) Rocks weathering
   C) Ice melting
   D) Boiling water

4. **What are the 4 signs of a CHEMICAL change?**

1.
2.
3.
4.

NAME _____

Chemistry I Worksheet
Classification of Matter and Changes

INSTRUCTIONS: Write ~~E~~ het in the blank if the material is *heterogeneous* or ~~O~~ hom. if it is *homogeneous*.

1. Wood ____
2. Freshly-brewed black coffee ____
3. Water ____
4. Lucky Charms® ____
5. Salt ____
6. Dirt ____
7. Sausage-and-mushroom pizza ____
8. Air ____
9. Milk ____ (homogenized pasteurized = hom; farm fresh = het)
10. Gold ____

INSTRUCTIONS: Classify each of the following as an *element* **[E]**, a *compound* **[C]**, or a *mixture* **[M]**.

11. Gold ____
12. Water ____
13. Seawater ____
14. Sugar ____
15. A chocolate sundae ____
16. Air ____
17. Carbon dioxide ____
18. Silver ____
19. Ice ____
20. A Big Mac® ____

INSTRUCTIONS: Classify each of the following properties of matter as *physical* **[P]** or *chemical* **[C]**.

21. Color ____
22. Density ____
23. Burns easily (flammable) ____
24. Not affected by acids ____
25. Boils at 450 °C ____
26. Reacts violently with chlorine ____
27. Good conductor of heat ____
28. Dissolves readily in water ____
29. Melts at 145 °C ____
30. Malleable ____

INSTRUCTIONS: Classify each of the following changes in matter as *physical* **[P]** or *chemical* **[C]**.

31. Grinding chalk into powder ____
32. Dissolving salt in water ____
33. Dissolving zinc in acid ____
34. Tearing a piece of paper ____
35. Stretching copper into wire ____
36. Burning gasoline ____
37. Hammering gold into foil ____
38. Melting ice ____
39. Digesting food ____
40. Making hydrogen from water ____

41. M[illegible] ____
42. D[illegible]y ____
43. M[illegible] ____
46. C[illegible] ____
47. V[illegible]me ____
48. [illegible]th ____

* not specifically tested, but mentioned when measuring density

Physical and Chemical Changes

Name: _____

Date: _____ Hour: ___

Place a check in the appropriate column:

Change	Physical Change	Chemical Change
Salt dissolves in water.		
Hydrochloric acid reacts with magnesium to produce hydrogen gas.		
A piece of copper is cut in half.		
A sugar cube is ground up.		
Water is heated and changed to steam.		
Iron rusts. (reacts w/ oxygen)		
Ethyl alcohol evaporates.		
Ice melts.		
Milk sours (goes bad). milk sugar (lactose) turns to acid		
Sugar dissolves in water.		
Sodium and potassium react violently with water.		
Pancakes cook on a griddle.		
Grass grows on a lawn.		
A tire is inflated with air.		
Food is digested in the stomach.		
Water is absorbed by a paper towel.		
Ethyl alcohol boils at 79°C.		
Paper burns.		
Water freezes at 0°C.		
Fireworks explode.		
Alka-Seltzer gives off carbon dioxide when added to water.		
Clouds form in the sky.		