

Chemistry Worksheet: Matter #1

1. A mixture (is/is not) a chemical combining of substances.
2. In a compound the (atoms/molecules) are (chemically/physically) combined so that the elements that make up the compound (retain/lose) their identities and (do/do not) take on a new set of properties.
3. The smallest identifiable unit of a compound is a(n) molecule, which is made up of atoms which are chemically bonded.
two or more
4. True or False: A mixture is always made up of a combination of elements.
could also be a combination of compounds, e.g. salt water
5. In a mixture, the substances (lose/retain) their identities.
6. In a mixture the substances involved (can/cannot) be separated by a simple physical process.
In a compound the elements involved (can/cannot) be separated by a simple physical process because the elements are (physically combined/chemically bonded).
7. True or False: An element can be broken down into a simpler substance.
(unless you mean protons/neutrons/electrons; but they don't really have properties of a substance or element)
8. The smallest identifiable unit of an element is a(n) atom.
9. From the following list of substances, circle the ones that are elements:

<u>silver</u>	carbon dioxide	wood alcohol	<u>chromium</u>
water	<u>hydrogen</u>	carbon	<u>nitrogen</u>
<u>oxygen</u>	<u>gold</u>	sugar	salt
air	<u>sulfur</u>	<u>magnesium</u>	<u>nickel</u>

just look at the periodic table
10. Explain how to separate the sugar and water in a solution of sugar and water.
Let the water evaporate, leaving behind solid sugar.
11. How would you separate a mixture of alcohol and water?
Heat the mixture and collect the vapors, which will be (mostly) alcohol. Cool the vapors and collect that liquid separately from the water that is in the original container.
12. How would you separate sand and water?
Filter the mixture. Water will flow through the filter but sand will be trapped in the filter.

13. Classify the following as pure substances or as mixtures:

air	<i>mix</i>	gasoline	<i>mix</i>	grain alcohol	<i>pure</i>
water	<i>{ deionized - pure tap or lake - mix</i>	sugar	<i>pure</i>	gold	<i>pure</i>
mercury	<i>pure</i>	oxygen	<i>pure</i>	salt water	<i>mix</i>

14. Classify the following as heterogeneous or as homogeneous:

sand & salt mixture	<i>het.</i>	hydrogen	<i>hom.</i>	iron	<i>hom.</i>
salt water	<i>hom.</i>	unfiltered air	<i>het (if there is dust)</i>	iron with rust	<i>het.</i>
pure water	<i>hom.</i>	an apple	<i>het.</i>	nitric acid	<i>hom.</i>
tossed salad	<i>het.</i>	granite	<i>het.</i>	wood	<i>het.</i>

15. Classify the following as an element, a compound, a solution, or a heterogeneous mixture:

aluminum	<i>element</i>	raisin bread	<i>het. mix</i>
carbon dioxide	<i>compound</i>	water	<i>{ deionized = compound tap or lake = homogen. mix = solu.</i>
sugar and water	<i>hom. mix (solution)</i>	sulfur	<i>element.</i>
sulfuric acid	<i>compound</i>	mercury	<i>element.</i>
an orange	<i>het. mix</i>	water & instant coffee	<i>{ no grit? = solution gritty? = het. mix</i>
a pencil	<i>het. mix</i>	carbon particles & sugar	<i>het. mix</i>
nitrogen	<i>element</i>	air	<i>hom. mix = solution</i>
gasoline	<i>hom. mix (solution)</i>	grain alcohol	<i>compound.</i>

(a solution) = homogeneous mixture

Elements, Compounds, and Mixtures

Classify each of the pictures below by placing the correct label in the blanks below:

A= Element

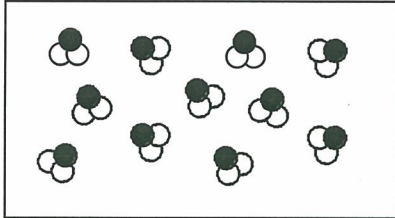
D= Mixture of compounds

B= Compound

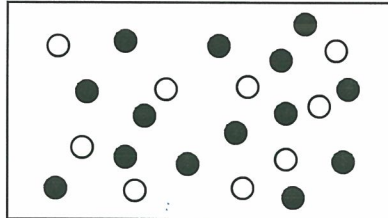
E= Mixture of elements and compounds

C= Mixture of elements

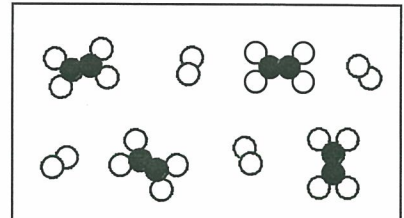
Each circle represents an atom and each different color represents a different kind of atom. If two atoms are touching then they are bonded together.



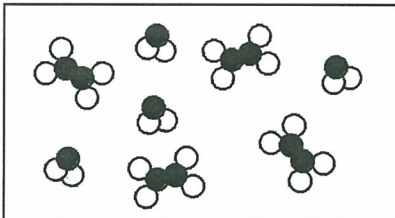
1) B



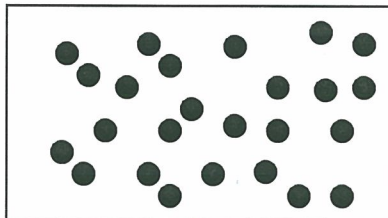
2) C



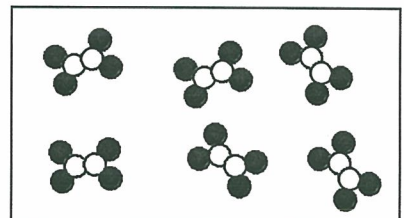
3) E



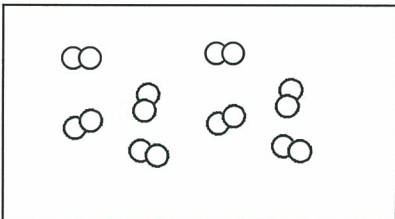
4) D



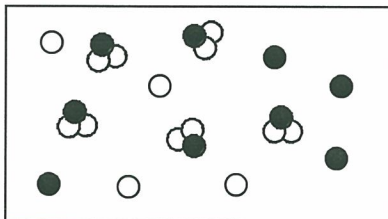
5) A



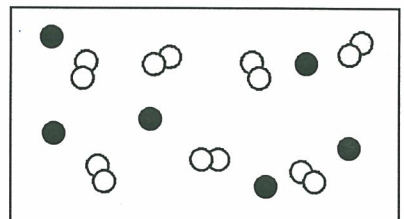
6) B



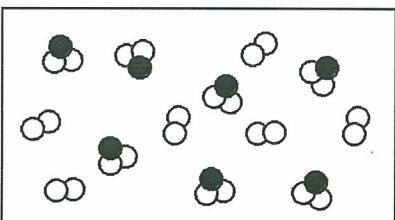
7) A



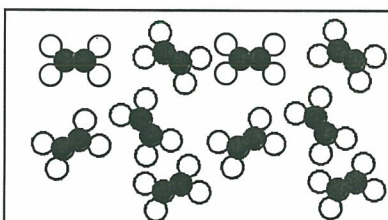
8) E



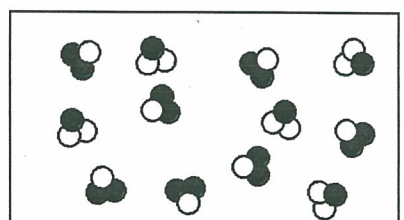
9) C



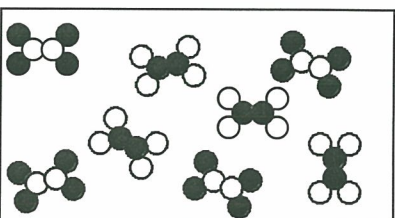
10) E



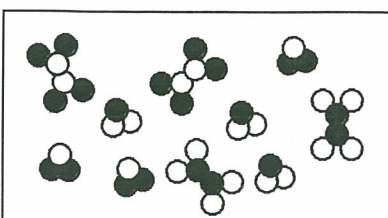
11) B



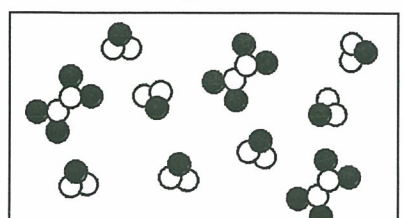
12) D



13) D



14) D



15) D

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. <i>(reacts w/ oxygen)</i>		✓
Ethyl alcohol evaporates.	✓	
Ice melts.	✓	
Milk sours (goes bad). <i>milk sugar (lactose) turns to acid</i>		✓
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.	✓	

NAME _____

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

- | | | | |
|--------------------------------|----------------------|-------------------------------|---|
| 1. Wood | <u>het</u> | 6. Dirt | <u>het</u> |
| 2. Freshly-brewed black coffee | <u>maybe either?</u> | 7. Sausage-and-mushroom pizza | <u>het</u> |
| 3. Water | <u>hom.</u> | 8. Air | <u>hom</u> |
| 4. Lucky Charms® | <u>het</u> | 9. Milk | <u>homogenized = hom</u>
<u>farm fresh = het</u> |
| 5. Salt | <u>hom</u> | 10. Gold | <u>hom</u> |

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

- | | | | |
|------------------------|----------|--------------------|----------|
| 11. Gold | <u>E</u> | 16. Air | <u>M</u> |
| 12. Water | <u>C</u> | 17. Carbon dioxide | <u>C</u> |
| 13. Seawater | <u>M</u> | 18. Silver | <u>E</u> |
| 14. Sugar | <u>C</u> | 19. Ice | <u>C</u> |
| 15. A chocolate sundae | <u>M</u> | 20. A Big Mac® | <u>M</u> |

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

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

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

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

* **INSTRUCTIONS:** Classify each of the following as an *intensive property* [I] or an *extensive property* [E].

- | | | | |
|-------------------|----------|------------|----------|
| 41. Mass | <u>E</u> | 46. Color | <u>I</u> |
| 42. Density | <u>I</u> | 47. Volume | <u>E</u> |
| 43. Melting point | <u>I</u> | 48. Length | <u>E</u> |

* not specifically tested, but mentioned when measuring density