

- The two general properties that all matter shares are mass and volume.
- Place a check mark next to each item that is matter which is made of atoms. (has mass and takes up space).

- | | |
|--|---|
| <input checked="" type="checkbox"/> a. apple | <input type="checkbox"/> f. heat |
| <input checked="" type="checkbox"/> b. air | <input checked="" type="checkbox"/> g. proton |
| <input type="checkbox"/> c. light | <input checked="" type="checkbox"/> h. oil |
| <input checked="" type="checkbox"/> d. water | <input checked="" type="checkbox"/> i. ice |
| <input checked="" type="checkbox"/> e. RNA | <input type="checkbox"/> j. radio waves |

- List the 4 states of matter, and circle the correct descriptions of their properties.

a. solid
 shape: indefinite or definite
 volume: indefinite or definite
 particle motion: vibrate in place

c. gas
 shape: indefinite or definite
 volume: indefinite or definite
 particle motion: high energy random

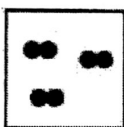
b. liquid
 shape: indefinite or definite
 volume: indefinite or definite
 particle motion: movement freedom flow around

d. plasma
 shape: indefinite or definite
 volume: indefinite or definite
 particle motion: highest energy + random

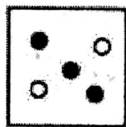
- Classify each type of substance as represented in diagrams 1-4 as element, compound, or mixture.

Diagram Key:

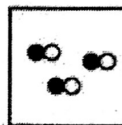
- atom A
- atom B



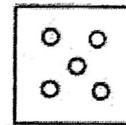
(1)



(2)



(3)



(4)

Classification: element mixture compound element

- Which of the diagrams from question 5. represent pure substances? (that is, NOT mixtures)
 How could you tell? 1, 3, 4 made of one type of particle
 (make sure you understand this explanation and ask if you need more discussion about it)

- Classify the following materials as:

<u>element</u>	<u>compound</u>
<u>homogeneous mixture</u>	<u>heterogeneous mixture</u>

- | | |
|--------------------------------------|--------------------|
| a. cheeseburger | <u>hetero</u> |
| b. salt water | <u>homogeneous</u> |
| c. air | <u>homogeneous</u> |
| d. hydrogen gas (H ₂) | <u>element</u> |
| e. silver (Ag) | <u>element</u> |
| f. steel | <u>homogeneous</u> |
| g. ice cream sundae | <u>hetero</u> |
| h. steam (H ₂ O) | <u>compound</u> |
| i. table salt (NaCl) | <u>compound</u> |
| j. carbon dioxide (CO ₂) | <u>compound</u> |
| k. ice (H ₂ O) | <u>compound</u> |

Can be separated by means.
 (circle one)

- | | | |
|-----------------|-----------------|-----------|
| <u>physical</u> | chemical | NO |
| <u>physical</u> | chemical | NO |
| <u>physical</u> | chemical | NO |
| physical | chemical | <u>NO</u> |
| physical | chemical | <u>NO</u> |
| <u>physical</u> | chemical | NO |
| <u>physical</u> | chemical | NO |
| physical | <u>chemical</u> | NO |
| physical | <u>chemical</u> | NO |
| physical | <u>chemical</u> | NO |
| physical | <u>chemical</u> | NO |

7. For the materials listed in question 6, list all that are pure substances. (recall your #5 answer above)

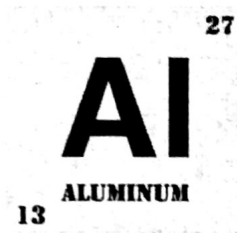
- ① hydrogen, H_2 ④ table salt, $NaCl$
② silver, Ag ⑤ carbon dioxide, CO_2
③ steam, H_2O ⑥ ice, H_2O

8. A student tries to identify three unknown white solids by observing and recording the data listed below (a-e). Which property would be the best to identify this unknown solid?

- A. white crystalline solid
B. mass is 7.00 g
C. volume is 2.0 mL
① D. density is 3.50 g/mL
E. insoluble (does not dissolve) in water

9. A few properties of aluminum are listed. Classify each property as a chemical or physical property.

- P a. can be rolled into sheets
C b. reacts with HCl to produce H_2 gas
C c. thin, white coat of aluminum oxide forms the surface
P d. melts at $660.3\text{ }^\circ C$
P e. density is 2.70 g/mL



10. Match each item with the correct statement below.

- A. element
B. compound
C. homogeneous
D. heterogeneous

- D describes mixture with a non-uniform composition (has different parts)
B substance that can only be changed into simpler substances by chemical means
A cannot be separated (broken down) by chemical means
C describes mixture with a uniform composition

11. Read each of the following descriptions, then determine if the substance described in each case is

Element, Compound, Homogeneous Mixture, Heterogeneous Mixture. Explain your choice.

Pure
Substance

Solution

- a) A cloudy white liquid is left to stand for several hours. At the end of this time, the top of the liquid is clear and there is a clump of white solid at the bottom of the liquid.

Heterogeneous because It separates into a clear liquid + a white solid

- b) A clear, colorless liquid is heated. Some of it boils away (evaporates) at 25 °C, then the rest boils away at 100 °C.

Homogeneous because 2 liquids w/ different boiling points separated physically (distillation)

- c) When heated strongly, a pure green solid decomposes into a white solid and a colorless gas.

Compound because it is chemically broken down into 2 new substances (green solid → white solid + gas)

- d) A pure yellow solid cannot be broken down into other substances chemically.

Element because it cannot be decomposed or broken down into a simpler substance

12. Which of the following warnings refers to a chemical property?

- a. Shake well b. fragile c. flammable d. handle with care

13. Baking soda is a white powdery solid which reacts with acids. It has a density of 2.20 g/mL Identify each of these descriptions as a physical or chemical property.

p: white, powdery, solid, density of 2.20 g/mL

c: reacts with acids

14. Describe the steps you would take to separate a mixture of sand and sugar.

1. place mixture in a funnel w/ filter paper
2. pour hot, boiling water through it + collect filtrate
3. Evaporate the filtrate until the sugar recrystallizes

15. Substances formed from atoms of two or more elements are called: compounds

16. List three physical properties of a copper penny

- orange luster malleable
- ductile density = 8.9 g/cm^3

17. What do you do if the flame of your Bunsen burner goes out?

Shut off the gas immediately

18. How do you put out an alcohol fire?

With the fire extinguisher