

Matter

anything that has mass and takes up space

Pure Substances

made up of only one type of particle

Element

Definition:

cannot be broken down into a simpler chemical substance by any physical or chemical means

Examples:

Hydrogen
(H or H₂)

Picture:



Hydrogen
Atoms

Compound

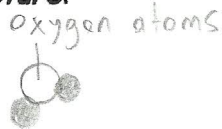
Definition:

composed of 2 or more different elements that are chemically joined.

Examples:

Water
(H₂O)

Picture:



hydrogen atoms

Mixtures

made up of at least 2 different types of particles

(uniform throughout)

Homogeneous Mixtures

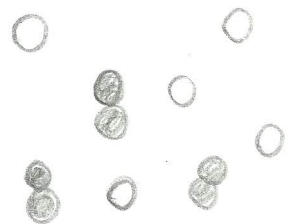
Definition:

has the same uniform appearance and composition throughout

Examples:

Tea with
Sugar

Picture:



Heterogeneous Mixtures

Definition:

visibly different substances or phases (gas, liquid, solid)

Examples:

Wet
Sand

Picture:



Chemistry: Classifying Matter

Name _____

Classify each of the materials below. In the center column, state whether the material is a **pure substance** or a **mixture**. If the material is a pure substance, further classify it as either an **element** or **compound** in the right column. Similarly, if the material is a mixture, further classify it as **homogeneous** or **heterogeneous** in the right column. Write the entire word in each space to earn full credit.

| Material | Pure Substance or Mixture | Element, Compound, Homogeneous, Heterogeneous |
|---|--------------------------------------|--|
| concrete | Mixture | Heterogeneous |
| sugar + pure water ($C_{12}H_{22}O_{11} + H_2O$) | Mixture | Homogeneous |
| iron filings (Fe) | Pure Substance | Element |
| limestone ($CaCO_3$) | Pure Substance | Compound |
| orange juice (w/pulp) | Mixture | Heterogeneous |
| Pacific Ocean | Mixture | Heterogeneous |
| air inside a balloon | Mixture | Homogeneous |
| aluminum (Al) | Pure Substance | Element |
| magnesium (Mg) | Pure Substance | Element |
| acetylene (C_2H_2) | Pure Substance | Compound |
| tap water in a glass | Mixture | Homogeneous |
| soil | Mixture | Heterogeneous |
| pure water (H_2O) | Pure Substance | Compound |
| chromium (Cr) | Pure Substance | Element |
| Chex mix | Mixture | Heterogeneous |
| salt + pure water ($NaCl + H_2O$) | Mixture | Homogeneous |
| benzene (C_6H_6) | Pure Substance | Compound |
| muddy water | Mixture | Heterogeneous |
| brass (Cu mixed with Zn) | Mixture | Homogeneous |
| baking soda ($NaHCO_3$) | Pure Substance | Compound |

Classifying Matter

Name _____

Part I. Classify each of the following substances as; an element, a compound, a solution, or a heterogeneous mixture.

| | | | |
|--------------------------|-------------------------|-------------------------------------|----------------------------|
| 1. Sand Heterogeneous | 2. Salt Compound | 3. Pure Water Compound | 4. Soil Heterogeneous |
| 5. Soda Heterogeneous | 6. Pure Air Solution | 7. Carbon Dioxide compound | 8. Gold Element |
| 9. Bronze Homogeneous | 10. Oxygen Element | 11. Salad Dressing Heterogeneous | 12. Salt Water solution |

Part II. In the spaces provided, describe the distinguishing characteristics of the major categories of matter.

| |
|--|
| 13. Element - one type of atom(s) |
| 14. Compound - two or more types of atoms linked together chemically |
| 15. Solution (Homogeneous) - uniform composition of 2 or more pure substances |
| 16. Heterogeneous Mixture - not uniform composition of 2 or more pure substances |