

# Working with Numbers and Matter

1. **Elements** are pure substances composed of only one kind of atom.
2. **Binary compounds** are substances made up of only *two* kinds of atoms.  
(examples:  $\text{H}_2\text{O}$ ,  $\text{NH}_3$ ,  $\text{CO}_2$ )
3. **Solutions** are the best examples of **homogeneous mixtures**. (Air, salt water, etc.)
4. **Heterogeneous mixtures** have discernable components and *are not* uniform throughout. (Chocolate-chip cookies, vegetable soup, soil, muddy water, etc.)
5. **Physical changes** do not form new substances. They merely change the appearance of the original material. (The melting of ice)
6. **Chemical changes** result in the formation of new substances.  
(The burning of hydrogen gas to produce water vapor)
7. The particles in a **solid** are rigidly held together.
8. **Solids** have a definite shape and volume.
9. **Liquids** have closely-spaced particles that easily slide past one another.
10. **Liquids** have no definite shape, but have a definite volume.
11. **Gases** have widely-spaced particles that are in random motion.
12. **Gases** are easily compressed and have no definite shape or volume.
13. **Distillation** separates mixtures with different boiling points.
14. **Filtration** separates mixtures of solids and liquids.
15. **Chromatography** can also be used to separate mixtures of liquids and mixtures of gases.
16. Rules for counting **significant figures**
  - Numbers 1-9 are all significant
  - Zeroes left of the number are never significant
  - Zeroes right of the number are significant only if there is a decimal point
  - Sandwiched zeroes are always significant

USE THE REFERENCE TABLES!!!