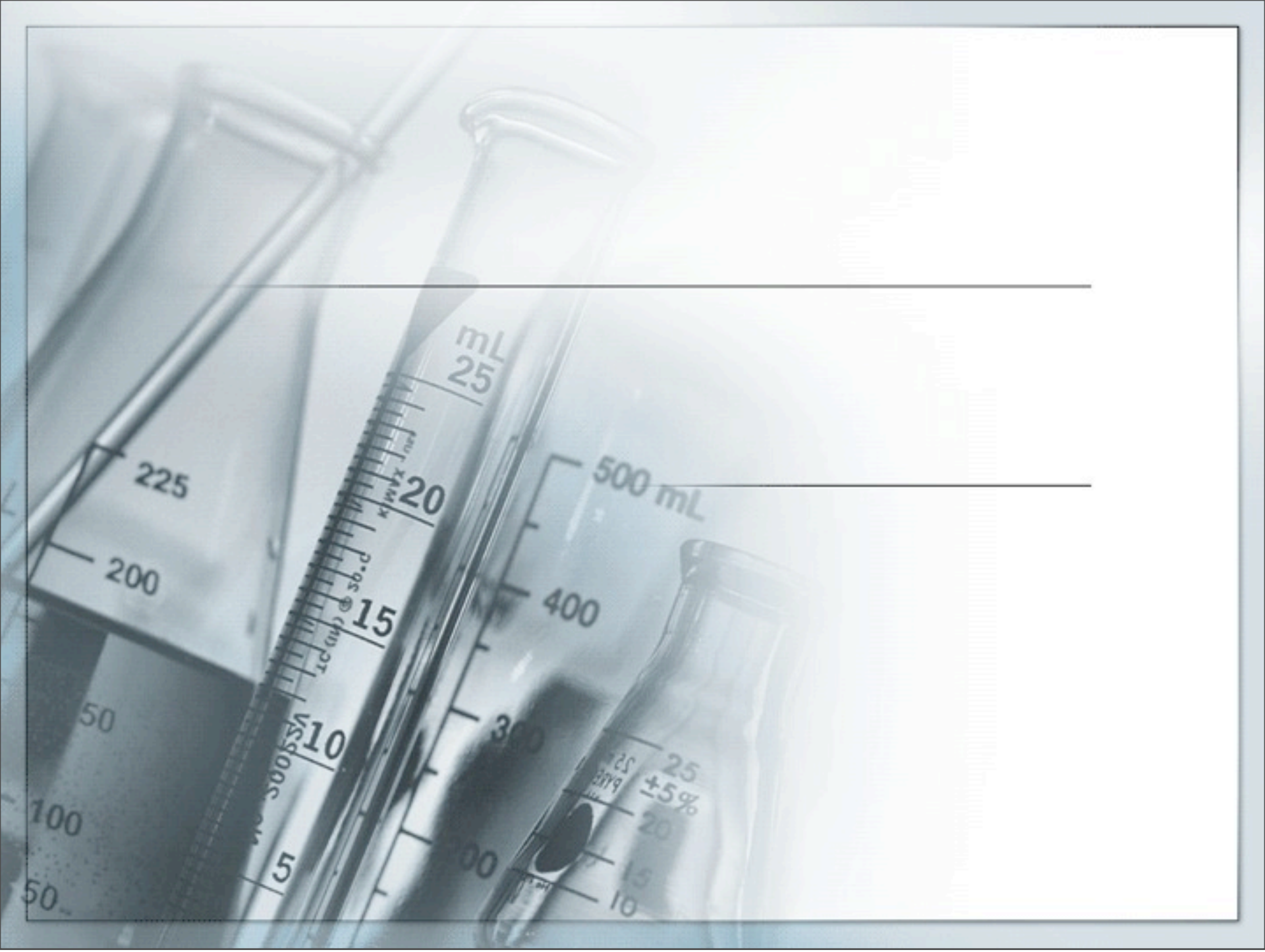
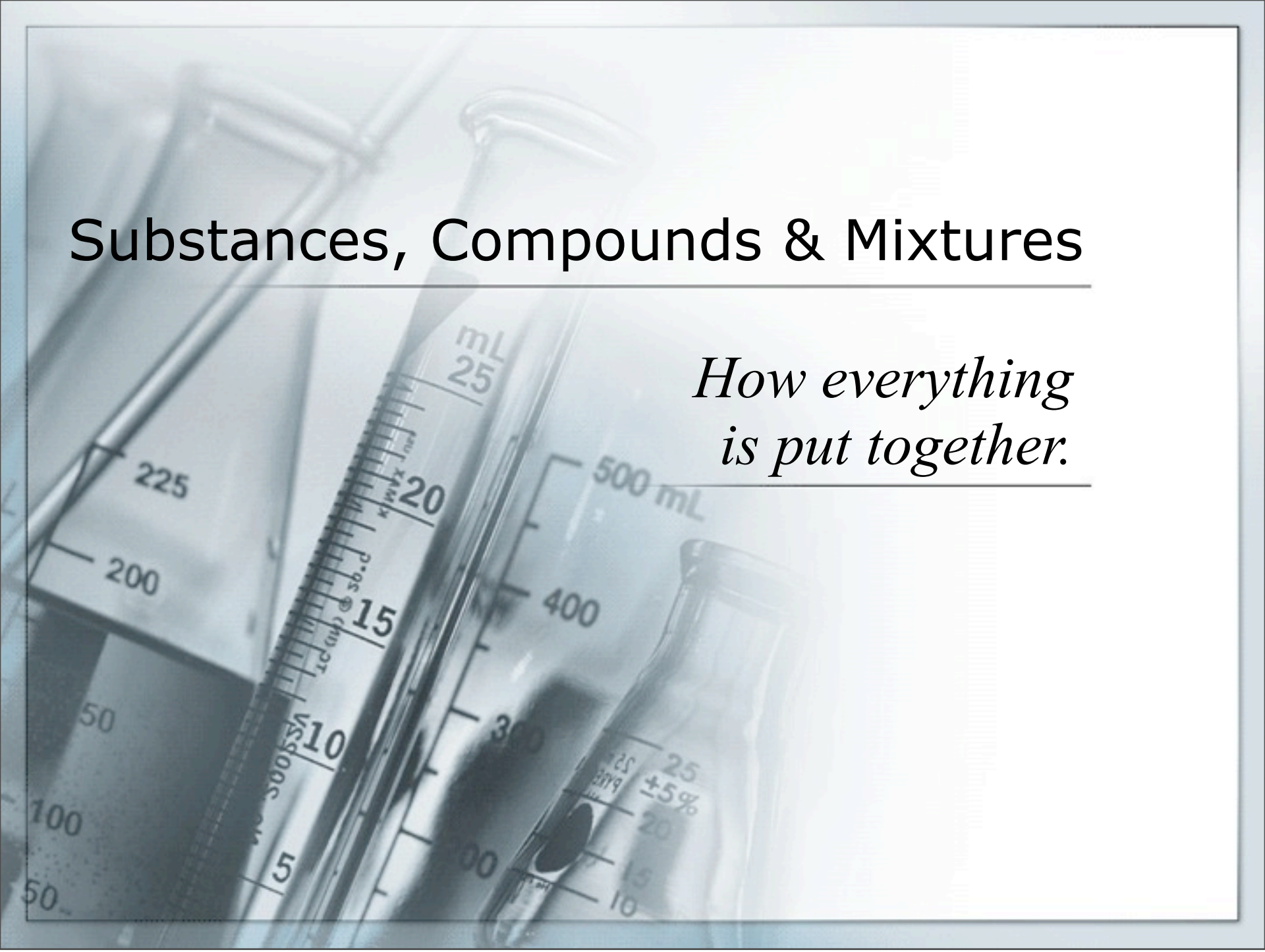

mL
25
20
15
10
5
225
200
50
100
50
500 mL
400
300
25
±5%
20

Substances, Compounds & Mixtures

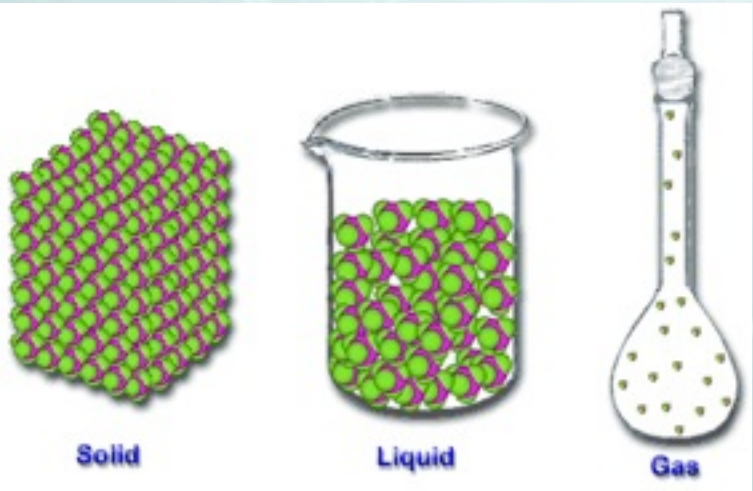
How everything is put together.



Substances

- Matter that has the same composition and properties throughout is called a **substance**.
- When different elements combine, other substances are formed.

Substances



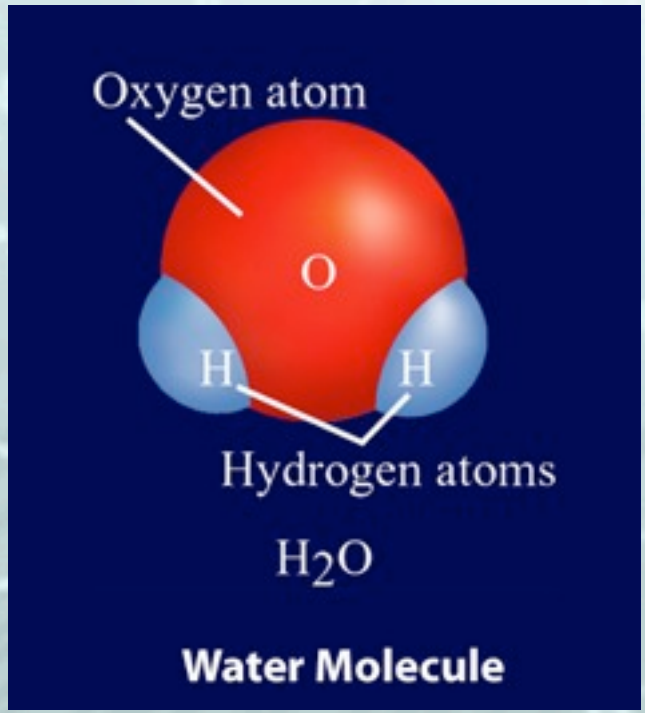
Picture from http://www.ilpi.com/msds/ref/gifs/statesofmatter.gif

- Contains only one particle
- Can exist in 3 states of matter
- Can be elements or compounds

Compounds

- A **compound** is a substance whose smallest unit is made up of atoms of more than one element bonded together.
- Compounds often have properties that are different from the elements that make them up.
- Examples: Water, salt, sugar

Compounds



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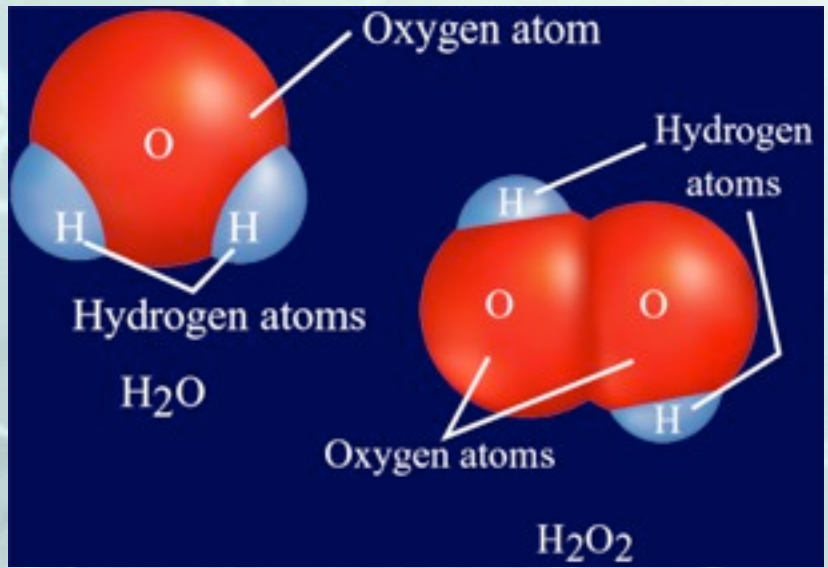
Compounds Have Formulas

- H_20 is the chemical formula for water, and H_2O_2 is the formula for hydrogen peroxide.
- The formula tells you which elements make up a compound as well as how many atoms of each element are present.

Compounds Have Formulas



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How to read a formula

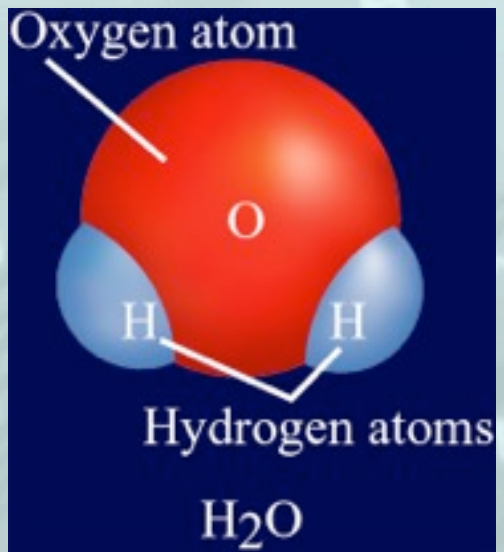
This is a subscript. It tells us how many atoms of that element exist in one unit of that compound.

Hydrogen is made of 2 H atoms and 1 O atom.

No subscript is used when only one atom of an element is present.

How to read a formula

H_2O



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Let's try it…

- Using your white board tell how many atoms there are in each element.
- **Sulfuric Acid H_2SO_4**
  - 2 Hydrogen
  - 4 Oxygen
- **Hydrogen Peroxide H_2O_2**

And some more formulas…

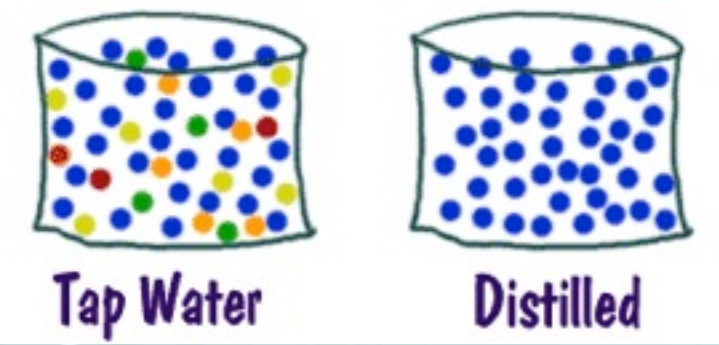
- **Carbon Dioxide CO_2**
  - 1 Carbon
  - 2 Oxygen
- **Carbon Monoxide CO**
  - 1 Carbon
  - 1 Oxygen
- **Calcium Carbonate** (Found in shells, eggshells, antacid) **$CaCO_3$**
  - 1 Calcium
  - 1 Carbon
  - 3 Oxygen

Compound Review

- *A pure compound has the same elements and the same amount of elements all of the time*
- Elements are chemically combined
- Compound properties are different from the properties of the elements
- They cannot be separated physically
- Physical properties such as boiling point or melting point of pure substances are do not change

Mixtures

- A mixture is a combination of two or more substances where there is **no** chemical combination or reaction.



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Mixtures combine physically in no specific proportions. They just mix.

Solids, liquids and gases can be combined to create a mixture.

Mixture Types

- MIXTURES MAY BE HOMOGENEOUS OR HETEROGENEOUS

Homogeneous Mixtures

- Homogeneous Mixtures:
- The prefix: "homo"- indicates the same
- Have the same uniform appearance and composition throughout

Solutions

- SOLUTIONS

are homogeneous mixtures

What is a solution?

- A solution is a mixture of two or more substances.
- At least two substances must be mixed in order to

A solution has two parts

- The substance in the smallest amount and the one that DISSOLVES is called the S

- The substance in the larger amount is called the SOLVENT - it does the dissolving
- IN most common instances water is solvent

Examples of solutions

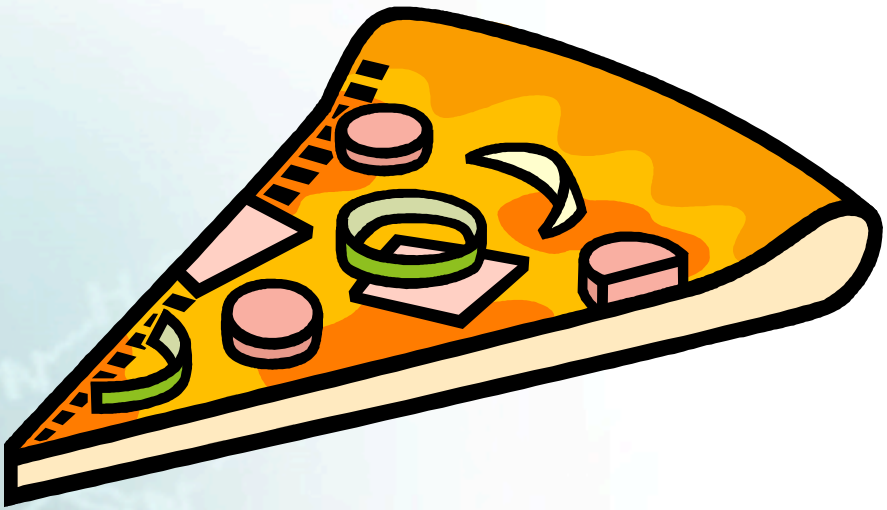
- Salt water
- Clean Air
- Vinegar

Heterogeneous Mixtures:

- The prefix: "hetero"- indicates difference
- A heterogeneous mixture consists of visibly different substances or phases
- Two or more parts can be seen

Examples:

- Pizza
- Sandwich
- Chex Mix



Suspensions

- A SUSPENSION is a heterogeneous mixture of large particles
- These particles are visible and will settle out on standing
- Examples of suspensions are: fine sand or silt in

Compounds vs Mixtures