

What do you know about elements?

What do you know about compounds?

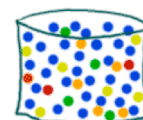
Mixtures

A pizza is a perfect example of a mixture. A mixture is a _____ of two or more substances - that are _____ combined.

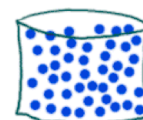
If they react and combine chemically, it will become a _____ instead. The ingredients in a pizza are all mixed together, but you still have separate ingredients. The cheese and sauce haven't combined to make a brand new substance.

Examples of Mixtures

When you see distilled water, it's a pure substance. That means there are just water molecules (H_2O) in the liquid. BUT, your tap water is a mixture of water with other things dissolved inside, maybe salt.



Tap Water



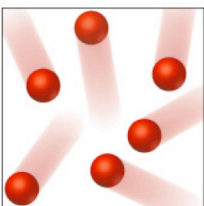
Distilled

Air consists of nitrogen, oxygen and other small amounts of various gases. Seawater is a mixture of water with dissolved chemicals such as sodium chloride. Gasoline is a mixture of hydrocarbons and other additives. People are highly complex mixtures made of mostly organic compounds. Medicine, perfume, the list goes on and on.

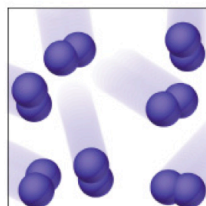
Mixtures don't like change & _____. In other words, because no chemical reactions took place, substances are the same before and after you mix them together. Because of this, it is still possible to _____ the substances from one another. Remember that with compounds, we can only separate them using chemical means (heating and electrolysis). What else makes a compound different from a mixture? In a mixture, the components do not have a definite ratio. In your pizza, you can add as much cheese or as little sauce as your heart desires.

Mixtures Vs. Compounds

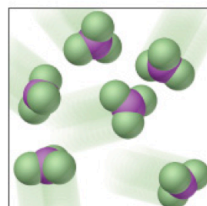
This is where it gets complicated - being able to tell the difference between a mixture and a compound. Think of water, a compound, made up of the elements hydrogen and oxygen. Not only is water totally different from its elements, but you can't easily separate the elements from the water. On the other hand, if you mixed sugar and sand in water, the mixture is both sweet (from the sugar) and gritty (from the sand). This sugar dissolves, but the sand doesn't - which lets you separate them easily.



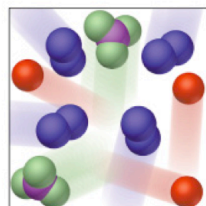
(a) Atoms of an element



(b) Molecules of an element



(c) Molecules of a compound



(d) Mixture of elements and a compound

Mixtures	Compounds
Made of	Made of
Components _____ their original properties	Components _____ their original properties
Separated by _____ means	Separated by _____ means
_____ ratio	_____ ratio

Solutions

A solution is a mixture that appears to be one substance, but is actually made of several things. The particles are _____ REALLY well! Basically, a solution is a mixture, where the particles are so well mixed that the composition is the same throughout and we can't see distinct molecules, even with a microscope.

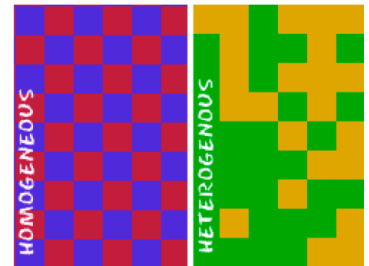
<p>Solutes & Solvents</p> <ul style="list-style-type: none"> • _____ is when substances separate and spread evenly throughout the mixture. • _____ = the dissolved substance. • _____ = the substance the solute dissolves in. • _____ = can dissolve in the solvent (sugar in water) • _____: cannot dissolve in the solvent (rocks in water) 	<p>A Solution: Salt Water</p> <p>Salt is highly soluble in water - that means it dissolves in water.</p> <ul style="list-style-type: none"> • Salt = the _____ • Water = the _____ <p>In fact, water dissolves so many substances, that it is called the universal solvent.</p>
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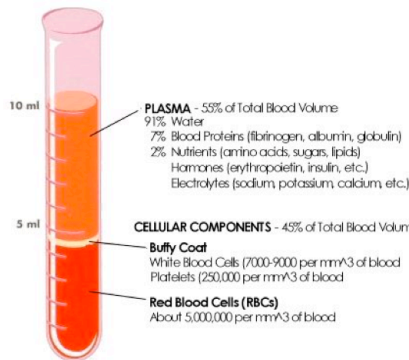
Special Solutions

Not all solutions are liquids. _____ are solid solutions of metals and nonmetals that have dissolved in metals. Brass is an example of an alloy - it is zinc dissolved in copper. Steel is carbon and other elements dissolved in iron. Gases can be solutions too.

Homogenous & Heterogenous Solutions

To understand these words, its best to understand their prefixes. "Homo-" means _____ or like. "Hetero-" means other or _____. Most solutions are _____ because the particles are spread evenly throughout the substance. Also, the particles are super _____ & you can't see them at all. Kool-Aid, steel, air, all are homogenous - you can't see the individual particles. In heterogenous solutions, the particles are larger, so they're clumpy & unevenly spread out. You can see the particles. There are 2 types of heterogenous solutions: 1) _____ and 2) _____



<p>1) Suspensions</p> <p>A suspension is a mixture that:</p> <ul style="list-style-type: none"> • has large particles you can see • can be easily separated by physical means • can block light & create shadows <p>Example: _____</p> <ul style="list-style-type: none"> • The big snow particles are mixed, but do not dissolve. • A light can't always shine through <p>Dirty air is a suspension. Think about dust that floats around in the air, and you can see it when a beam of light falls on it. The dust particles are too big to fully mix and combine with the air/gas particles. Salad dressing is another example.</p>	<p>Blood!! Blood is a special type of suspension. It consists of red and white blood cells and platelets - which are actually suspended in a solution called _____. The solution - surprise surprise - is water. This plasma is 91% water and 9% particles (sugars, vitamins, ions).</p>  <p>PLASMA - 55% of Total Blood Volume</p> <ul style="list-style-type: none"> 91% Water 7% Blood Proteins (fibrinogen, albumin, globulin) 2% Nutrients (amino acids, sugars, lipids) Hormones (erythropoietin, insulin, etc.) Electrolytes (sodium, potassium, calcium, etc.) <p>CELLULAR COMPONENTS - 45% of Total Blood Volume</p> <ul style="list-style-type: none"> Buffy Coat White Blood Cells (7000-9000 per mm³ of blood) Platelets (250,000 per mm³ of blood) Red Blood Cells (RBCs) About 5,000,000 per mm³ of blood
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2) Colloids: A colloid is a mixture that:

- Has small particles (smaller than a suspension, bigger than a solution)
- Difficult to separate because the particles are so small
- Can also block light
- Similar to emulsions

Examples: slime, ice cream, mayonnaise, jello, whipped cream, etc