

**Solutions**

**A SOLUTION is a mixture that is homogeneous at the molecular level.**

OR—a solution is a mixture that is so well mixed that is the same throughout, even down to the molecules. And those molecules can be separated physically.



18K gold is a mixture of silver and gold

A mixture of two metals is called an **alloy**.

Some Common Solutions:

Bottled water; salt water; air; carbonated water; rubbing alcohol; 14 or 18-karat gold.

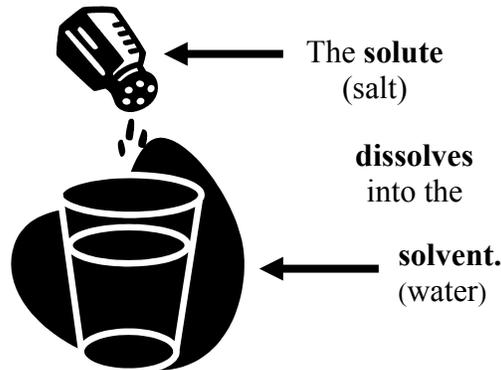


Air is a solution, but not an alloy.

These are all homogeneous and can be separated physically.

When something goes into solution we say it **dissolves**.

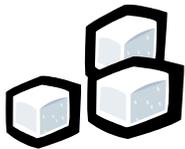
Salt dissolves into water to make salt water—a solution.



One part of the solution is always bigger in amount. This is the **solvent** (what is dissolving). The smaller part is the **solute** (what is being dissolved).

**The solvent dissolves the solute.**

**Solute - smaller word, smaller amount**  
**Solvent - larger word, larger amount**



Sugar is **soluble** in water.

**Soluble**— something that can be dissolved into a solution. Salt is soluble in water.

**Insoluble**— something that cannot be dissolved. Oil is insoluble in water (or oil is not water soluble).



Oil is **insoluble** in water.

**Saturated**—When a solution cannot dissolve more solute (it's full).

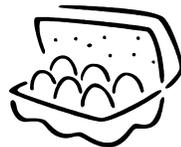
**Unsaturated**—When a solution can hold more solute (not full yet).

**Supersaturated**— When a solution has more solute than it can hold (over full). The solute will fall out of a supersaturated solution.

**Mixtures that are not Solutions**

**Suspensions**—a temporary mixture in which the particles eventually settle.

Silt in water is a common suspension.



and they don't settle (like in suspensions).

**Colloids**—a mixture that has larger particles, like milk, mayonnaise, egg whites. The particles come in clusters, not single molecules (like in solutions)

Can tell a colloid by the **Tyndall effect**.

**Tyndall effect** —scattering of light.

Mixture	Particle size	Scatters Light?	Settles?	Separated by filtering?
Solutions	Molecular (smallest)	No	No	No
Colloids	Slightly larger in clusters	Yes	No	No
Suspensions	Larger particles (often visible)	Yes	Yes	Yes

Name: \_\_\_\_\_

Period: \_\_\_\_\_

<p><i>Soluble or insoluble in water:</i></p> <p>Cooking oil _____</p> <p>Sugar _____</p> <p>Soap _____</p> <p>Dirt _____</p> <p>Salt _____</p>	<p><i>Circle the <u>solute</u> and underline the solvent.</i></p> <p>Salt water</p> <p>Sugar water</p> <p>A solution of 20% HCl and 80% water.</p> <p>Chocolate milk</p> <p>Rubbing alcohol: 60% alcohol; 40% water.</p>	<p><i>Solution (So), suspension (Sp), or colloid (C)?</i></p> <p>It settles _____</p> <p>Doesn't settle or scatter light _____</p> <p>Scatters light, but doesn't settle _____</p> <p>Homogeneous at molecular level _____</p> <p>Particles sometimes visible _____</p>
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<p>1. Solution</p> <p>2. Alloy</p> <p>3. Dissolve</p> <p>4. Suspension</p> <p>5. Colloid</p> <p>6. Insoluble</p>	<p>A. When a substance cannot be dissolved into a solution.</p> <p>B. A mixture of two metals.</p> <p>C. A mixture that is homogeneous at the molecular level.</p> <p>D. When something seems to disappear into a solution.</p> <p>E. A mixture that scatters light and the particles do not settle out.</p> <p>F. A temporary mixture; the particles will eventually settle.</p>	<p>1. Supersaturated</p> <p>2. Saturated</p> <p>3. Tyndall Effect</p> <p>4. Unsaturated</p> <p>5. Solute</p> <p>6. Solvent</p>	<p>A. When a solution can hold more solute.</p> <p>B. When a solution can't hold more solute.</p> <p>C. When a solution has more solute than it can hold.</p> <p>D. The part of a solution that is biggest. (The water in salt water.)</p> <p>E. The scattering of light in a colloid.</p> <p>F. The part of a solution that is smallest. (The salt is salt water.)</p>
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Across:

- 1. When a solution has more solute than it can hold.
- 3. When a solution can hold more solute.
- 4. When a substance cannot be dissolved into a solution.
- 6. A temporary mixture; the particles will eventually settle.
- 7. When a solution can't hold more solute.
- 10. A mixture that is homogeneous at the molecular level.
- 11. The part of a solution that is smallest (The salt in salt water).

Down

- 2. The scattering of light in a colloid.
- 5. When something seems to disappear in a solution.
- 8. A mixture of two metals.
- 9. A mixture that scatters light and the particles do not settle out.
- 10. The part of a solution that is biggest. (The water in salt water).

