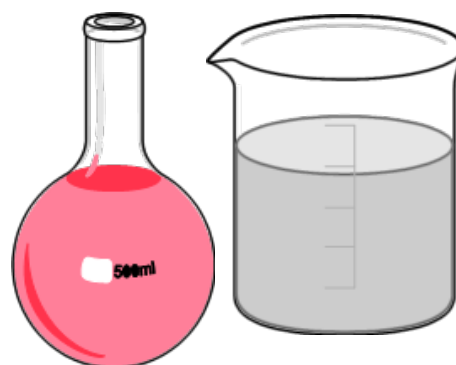


## Chapter 5 Solutions

Use The Internet and define the following terms

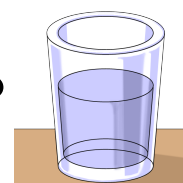


Terms: dissolving, solute, solvent, soluble, insoluble.

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## What Makes Materials Dissolve?



We can form solutions by mixing one or more materials together (like sugar and water). This is dissolving.

Not all mixtures form solutions.

**What other things get dissolved?**

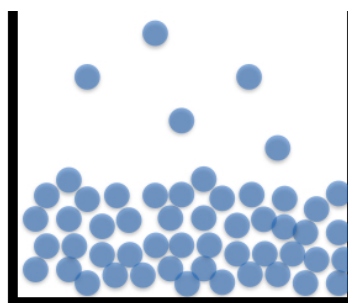
## The Attraction of Particles when Dissolving can be explained by the Particle Theory

### Particles stay together because

i) they are attracted to each other. Sometimes particles can become attracted to other particles (like sugar and water).

ii) Particles are always moving.

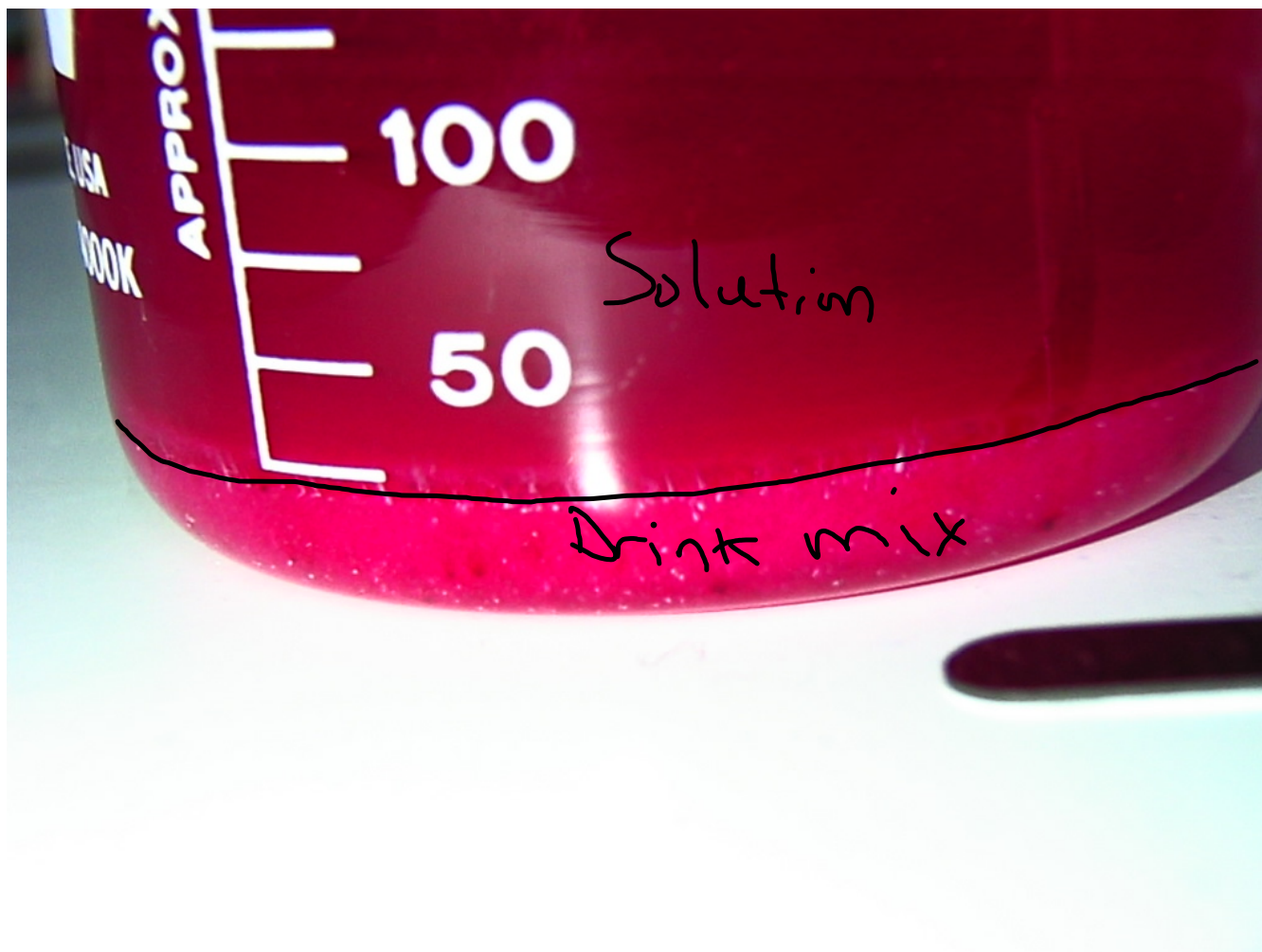
From your textbook



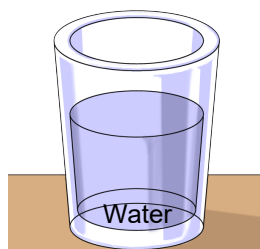
A drop of water of water evaporates into gas.

The particles are always moving, however, and some are always on the outside of the drop. These outside particles occasionally jump off into the air. Overtime, all the particles jump off. They still exist, but they are independent and free to move about as gas.





## Why Do Some Materials NOT Dissolve?



Solvent



Solute

There is usually less solute than solvent in a solution (more solvent than solute.)

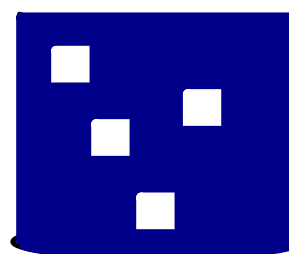
**Solute** - is the substance that dissolves in a solvent to form a solution

**Solvent** - is the substance that dissolves a solute to form a solution

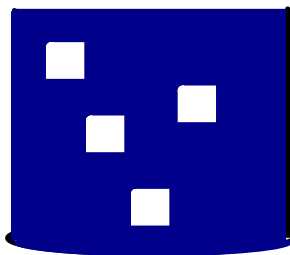


Water  
**Solvent**

Sugar Cube  
**Solute**



Sugar Water  
**Solution**



**Sugar Dissolves in Water**

**or**

**Sugar is Soluble in Water**

**Soluble** - means able to be dissolved in a particular solvent

**Insoluble** - means not able to be dissolved in a particular solvent

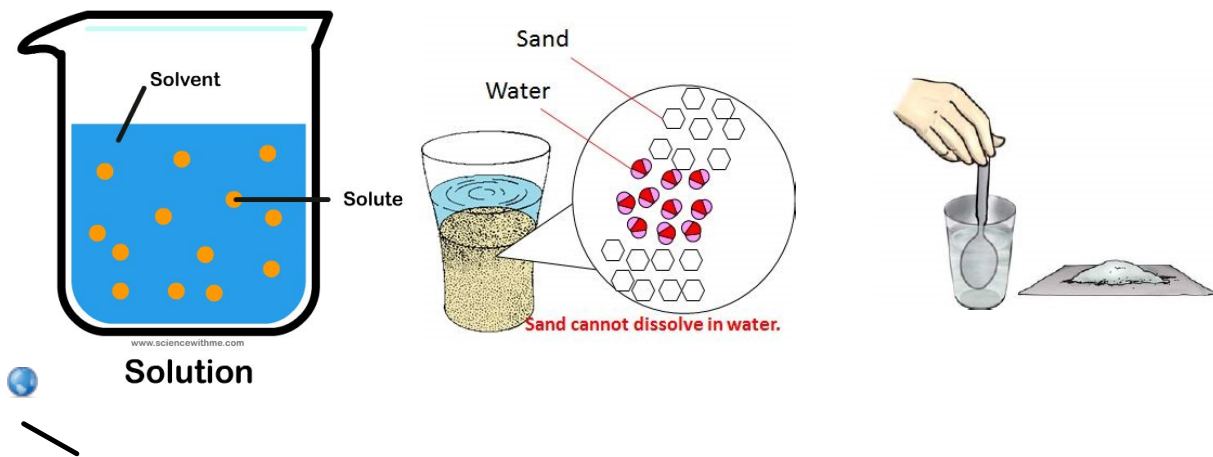
## Solubility

- The ability of a particular substance to dissolve.



When something is insoluble that means it will not dissolved in a solvent.

In order for materials to dissolve that have to be more attracted to solvent than other particles.





## Why is it so hard to get Grass Stains out of your pants?

1. Because of the Attraction that the Chlorophyll particles have to each other
2. Because Water is not soluble (Insoluble) to Chlorophyll
3. Grass Stains actually need a solvent different then water to remove the stain.

### REMEMBER

In order for particles to dissolve those particles NEED to more attracted to the water than attracted to their other particles.

Got any ideas of what can take the stains out?

Try these questions

1) **I am the Substance that dissolves a solute?**

A. Solution



B. Solvent



C. Solubility



**2) I am a mixture of two or more materials that merge to form one set of Properties?**

A. Solution



B. Solvent



C. Solubility





3) **The ability of a substance to dissolve?**

A. Solution



B. Solvent



C. Soluble

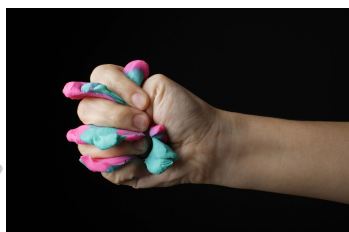


## Solutions to previous Multiple choice

1)B      2) A      3) C

## Changes in Mixtures and Solutions

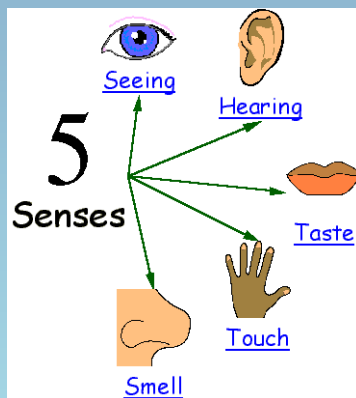
**Physical Change:** Changes that do not alter the chemical nature of the substances involved. It can involve changing the size, color, shape, texture and volume. These changes are reversible.



## Physical Properties

One of the physical properties of matter is its state.

Another way to describe physical properties is using our senses.

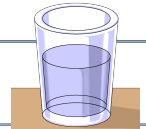


What could we observe from each of the 5 senses?

- i) Sight: color, bright, dull
- ii) Hearing: Bubbling, crackling, snapping
- iii) Taste: sweet, salty, bitter
- iv) Touch: Rough, soft, slimy,
- v) Smell: Sweet, rotten,



## Water in the Environment



Water is the "Universal Solvent" because it dissolves so many solutes than any other solvent.



Your Blood is composed of 50% water



The Ocean contains 97% of Earth's Water

Polar Ice Caps make up 2% of Earth's Water

Only 1% of water on Earth is Fresh (Useable)

All substances are not soluble in water.

The usability of water depends on what is mixed with it.

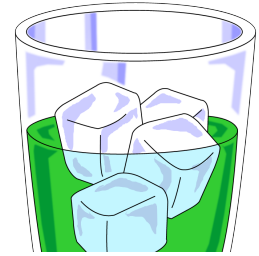
## **Materials That Can be Mixed with Water in The Environment**

Dissolved Salts

Undissolved Solids

Other Dissolved Solids

Dissolved Gases



## Concentration or Concentrated Solution

The **concentration** of a solution is the proportion of the solute to solvent. If there is a lot of solute in a solution, then it is "**concentrated**".

If there is a low amount of solute, then the solution is said to be "**diluted**."



Think about your frozen concentrated juice. If you pit 3 cups of water vs putting 2 cups of water, what happens to the taste?

## Dissolved Salts

Basically it refers to Salt Water or seawater  
(Not all bodies of water has the same amount of  
salt to water ratio)

Body of water	salt %
Arabian sea	3.7
Atlantic and Pacific	3.2 - 3.7
Baltic Sea	1 or less
Dead Sea	27
Great Salt Lake, Utah	5 - 27
Red Sea	4.1

This table indicates salt concentration in  
body's of water around the world

Too salty to drink or use it for watering plants.



## **Dissolved Salts**

It is easy to extract the solute from the mixture. Just allow the mixture to sit and the water will evaporate  
- leaving the salt



Extracting the Solvent (water) is more difficult -  
Distillation is required

Use the Internet to find the following terms.  
and videos and examples

Distillation, Desalination, Hard Water, Soft Water,  
Settling.

