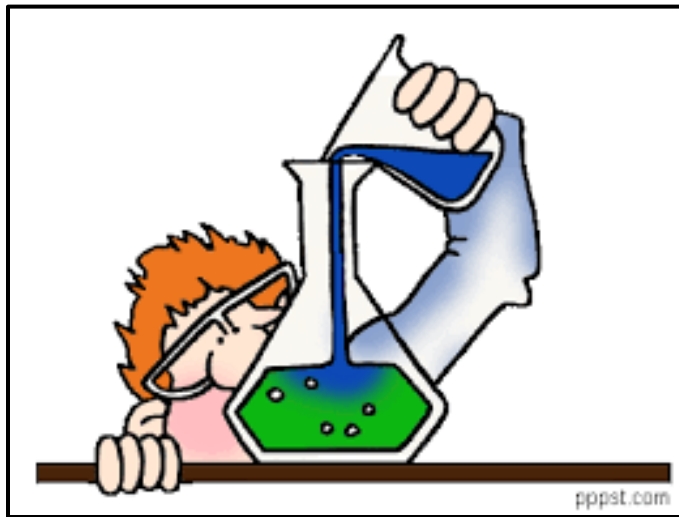


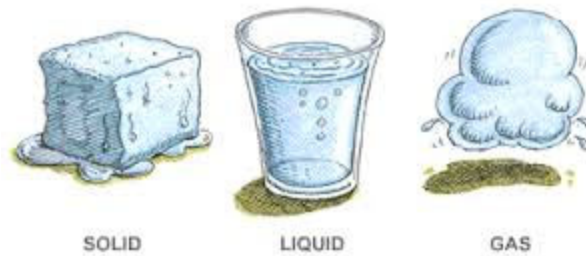
# Part 3

# Mixtures.



## All about States of Matter

You've likely heard about the three states of matter – gases, solids and liquids. But did you know there are actually six forms of matter? In laboratories, scientists can create plasmas, Bose-Einstein condensates and fermionic condensates, according to NASA. But, for our discussion, we'll focus on the first three because those are the states of matter you're likely to interact with.



## Fun Facts about States of Matter for Kids

- Liquids, like water, oil and soda, shift to fit inside the container they're in. If you look at them under a microscope, you'll see that they have particles that are close together, but have no rhyme or reason. The molecules move around.
- Gases, including air, steam and helium, are free-flowing. You can easily put your hand through them. Gases shift to fit their container and can even fill it. Their molecules are spaced far apart and wiggle and jiggle.
- Solids, like your desk, your backpack and your pants, are firm and stable. Their molecules are grouped together in organized patterns. The molecules might vibrate slightly, but they don't move around.

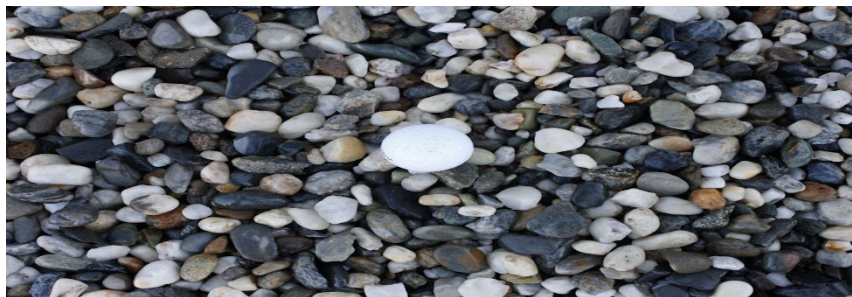
## What is a pure substance?

A **pure substance** is defined as **substance** that is made of only one type of atom or molecule.

[illegible]

## What is a Mixture

A mixture is formed of little bits of one or more substances mixed together. Usually, the parts can be separated from each other by physical means, because it does not involve any chemical reactions or bonds.



## Types of Mixtures

A **mixture** can involve two or more substances of the same phase or different phases. For example, you can mix water and sand (liquid and solid), sugar and salt (solid and solid), water and oil (liquid and liquid) or nitrogen and oxygen (gas and gas).

## SOLUTIONS (dilute, concentrated, saturated)

A **solution** is a mixture involving a **solute** and a **solvent** that is the same throughout the whole mixture.

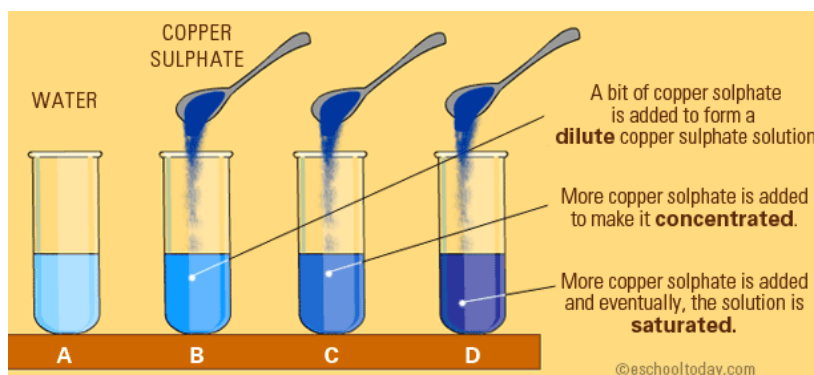
The solute is the substance that gets dissolved and the solvent is the liquid in which the solute **dissolves**. The solute (may be liquid or solid) is broken down completely into individual ions or **molecules** in a way that can no longer be seen.

A material is said to be **soluble** if it dissolves completely in a solvent.

*For example:* If you dissolve salt (solute) in water (solvent), the salt is broken down into Sodium and Chlorine ions within the solvent. This mixture will look and taste the same everywhere in the cup, and would have salt and water in the same proportions. In this example, salt is a soluble material.

### How can you identify a solution from other mixtures?

1. No particles will be visible.
2. It will have a clear look.
3. Nothing will settle at the bottom of the bottle holding it.
4. It cannot be filtered.



### What is a saturated solution?

If you keep adding a solute to a solvent, it gets **concentrated**. If you keep adding, eventually, no more solute can be dissolved with temperature remaining constant.