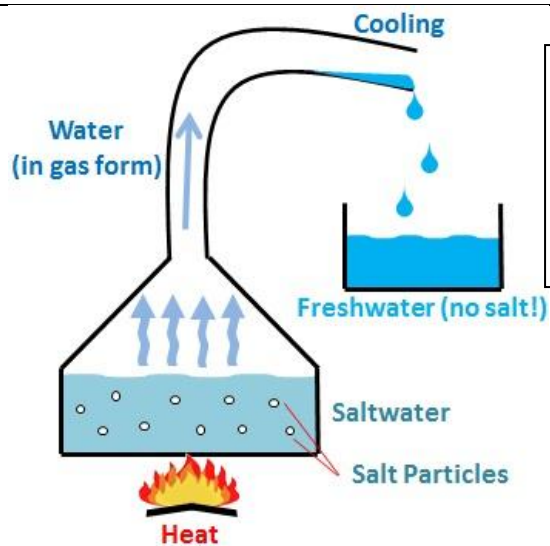


Properties and Changes of Materials

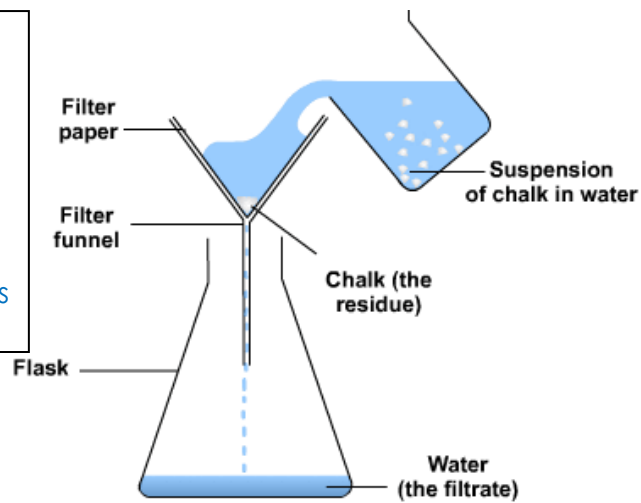
A material is any substance that has a name. For example: chalk, paper, wood, iron, air, water, clay, plastic, rubber, stone, leather, wax. Everything is made up of materials. When we want to make something, we need to choose the best material for the job. This unit will be focusing on the properties of materials and how their state can be changed by: heat or cold; reacting or mixing with another material; along with if they can be changed back afterwards.

Key facts	Key Vocabulary	
The property of a material is something about it that we can measure, see or feel and helps us decide whether or not it is the best material.	Burning	An irreversible chemical reaction between heat, fuel and oxygen.
Most materials have more than one property and can be natural, man-made, strong, weak, heavy, light in weight, rough, smooth, shiny, dull, hard, soft, flexible, brittle, magnetic, non-magnetic, transparent, opaque, electrical conductor, electrical insulator, conductor of heat, thermal (heat) insulator, burns when heated, does not burn, melt easily or not melt easily.	Condensation	The process of water vapor turning into liquid water.
	Conductivity	How well a material allows heat (thermal conductivity) or electricity (electrical conductivity) to pass along it or through it.
Materials exist in three states: a solid, a liquid or a gas. Materials can sometimes be changed from one state to another, perhaps by heating them – for example, ice is a solid which becomes a liquid when it's heated.	Dissolve	To become absorbed in a liquid solution, or make a solid do this.
Some materials can be changed. They can be mixed with other materials (for example when the ingredients are mixed together to make a cake) and then changed again by heating. Because this change cannot be 'undone' we say that it is irreversible. Some changes, though, are reversible. For example, when ice is heated it melts and becomes water, but this change can be reversed by re-freezing the water into ice.	Evaporation	The process of a liquid turning into a gas.
	Flexibility	The ability to bend or be bent repeatedly without damage or injury.
<p style="text-align: center;">Changes of state:</p>	Freezing	The process of a liquid turning into a solid.
	Hardness	Resistance to scratching or pressure. Hardwood does not mark as easily as softwood.
	Insoluble	Unable to dissolve.
	Irreversible	Impossible to reverse or undo.
	Man-made	Made by human beings and not occurring naturally
	Melting	The process of a solid turning into a liquid.
	Natural	Present in or produced by nature, not artificial or synthetic (e.g. wood)
	Reversible	Able to be changed or undone.
	Solution	A substance consisting of two or more materials mixed together.
	Transparency	How easy it is to see through a material.



When a material has dissolved into water, you can separate the solution by heating up the water until it evaporates, leaving the material behind.

When an insoluble material is mixed into water, you can separate the mixture by pouring the solution through a filter of an appropriate size. This is called filtration.



For something to combust (burn), there are 3 things required: A fuel source (what is being burnt), oxygen, and heat. When all of these are readily available, then the material will combust and produce a flame.

Burning is an irreversible reaction, as the original material cannot be returned to its previous state.

