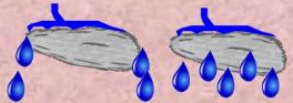


Properties and Changes of Materials- Knowledge Organiser


Vocabulary	Definition
Materials	The substance that something is made out of, e.g. wood, plastic, metal.
Solids	One of the three states of matter. Solid particles are very close together, meaning solids, such as wood and glass, hold their shape.
Liquids	This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.
Gases	One of the three states of matter. Gas particles are further apart than solid or liquid particles and they are free to move around. A gas fills its container, taking both the shape and the volume of the container. Examples of gases are oxygen and helium.
Melting	The process of heating a solid until it changes into a liquid.
Freezing	When a liquid cools and turns into a solid.
Evaporating	When a liquid turns into a gas or vapour.
Condensing	When a gas, such as water vapour, cools and turns into a liquid.
Conductor	A conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (they conduct heat) and electrical conductors (they conduct electricity).
Insulator	An insulator is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical insulators.
Transparency	A transparent object lets light through so the object can be looked through, for example glass or some plastics.

Properties of Materials

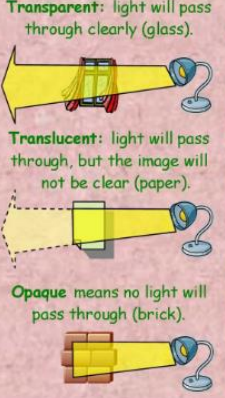
There are lots of words we can use to describe a material, here are just a few...




Impermeable: liquid cannot pass through.
Permeable: liquid can pass through.




Conductor: to let something pass.
Insulator: to stop something passing.
For example heat (thermal) or electrical conductivity.




Transparent: light will pass through clearly (glass).
Translucent: light will pass through, but the image will not be clear (paper).
Opaque: means no light will pass through (brick).



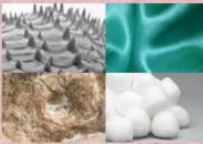
Heavy **Light**




Brittle **Strong**



Malleable (bendy/flexible)
Rigid (stiff)




Rough **Smooth**



Hard **Soft**

Changing Materials




The candle wax is **reversible** as it can change between solid and liquid depending on the heat. The wick (string) is **irreversible** as when it burns, it cannot change.

There are 3 states: solid, liquid or gas. Some materials can change between these states. For water:

Solid → Liquid = **melt** Liquid → Gas = **evaporate**
Gas → Liquid = **condense** Liquid → Solid = **freeze**

Reversible change: when materials can change state, then back again, for example, candle wax.
Irreversible change: when materials can change state, but cannot change back, for example, burning wood.



Ice → **Water**

Evaporation: Liquid to Gas
Condensation: Gas to Liquid
Melting: Solid to Liquid
Freezing: Liquid to Solid
Vapour

Heat is often the cause of changing state.
Different materials have different temperatures when they turn from solids to liquids, to gases, and back.