



# Heat - Solid and Liquid

When heat is applied to a material changes occur—some of them can be reversed (changed back) some of them are irreversible.

e.g.  $\text{ice} \xrightarrow[\text{(melting)}]{\text{heat}} \text{water} \xrightarrow[\text{(evaporation)}]{\text{heat}} \text{steam} \xrightarrow[\text{(condensation)}]{\text{cool}} \text{water} \xrightarrow[\text{(freeze)}]{\text{cool}} \text{ice}$

As you can see this is a reversible change.

BUT:  $\text{paper} \xrightarrow{\text{heat}} \text{paper ash}$

$\text{wax (candle)} \xrightarrow{\text{heat}} \text{melted/liquid wax}$

If burning takes place the change is ALWAYS irreversible.

Many solid materials take in (conduct) a lot of heat before any change takes place. They conduct heat at different rates. E.g. Most metals are good conductors of heat—if warmed they get hot quickly. A hot pan of soup is better stirred with a wooden, rather than a metal spoon, because although the wooden spoon soon becomes warmer, the metal spoon soon becomes too hot to hold.

i.e. Metals are better conductors of heat than wood.

The effect of heating and cooling can be seen in nature with the water cycle.

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