

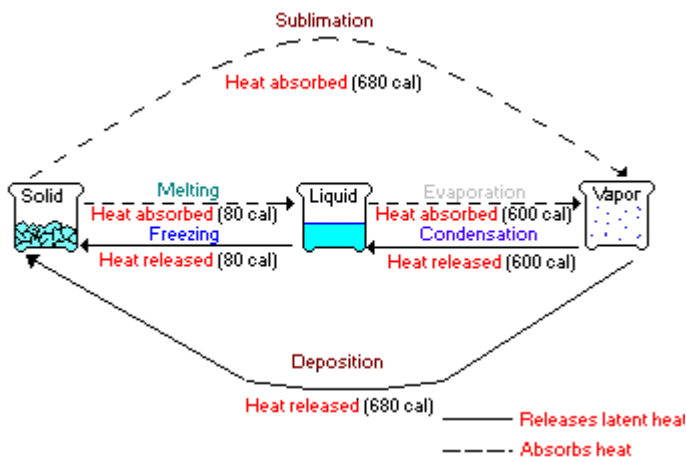
## Topic 2 - Changes In Matter

Matter can change from one form to another, or create new materials.

Every kind of matter has its own distinguishing characteristic properties that can be used to identify the kind of matter it is. **Properties** are characteristics that can be used to describe how a substance behaves substance. These properties can be physical or chemical.

Changes that matter can undergo fall into two classification categories: physical change and chemical change.

A **physical change** occurs when a material changes form but not composition. A change of state is an example of a physical change where energy is used or released.



No new substances are formed. The change is not permanent. Dissolving is also a physical change.

A **chemical change** occurs when two or more substances react and create one or more new substances. It is often permanent, although not always. Combustion is an example.

### Can You Ever Be Sure About Changes?

It is often difficult to decide if a change is physical or chemical, so certain clues will help you decide if a chemical change has occurred.

- Change in colour
- Change in odour
- Formation of a gas (bubbles) in a liquid
- Formation of a solid (precipitate) in a liquid
- Release or absorption of energy (heat)
- Materials you started with are used up
- A new material is formed
- The change is difficult to reverse

The only evidence that will guarantee a chemical change has occurred is that a new substance has been formed.

### Properties: Chemical or Physical?

Any property that can be observed without forming a new substance is a physical property. These can include: color, texture, luster, smell, state, melting point, boiling point, hardness, malleability, ductility, crystal shape, viscosity, solubility, density and conductivity (electrical and heat).

Any property that describes how a substance reacts with another substance when forming a new substance is a chemical property. Chemical properties include: reaction with acids, ability to burn (combustibility), reaction with water, behaviour in air and reaction to heat, toxicity, stability.