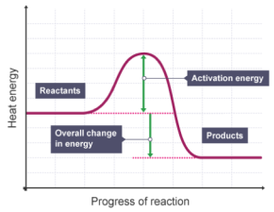
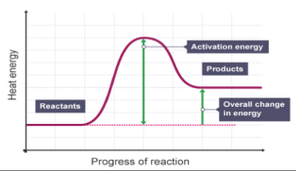
The de Ferrers Trust

CHEMISTRY – YEAR 9 – Energy Changes HIGHER

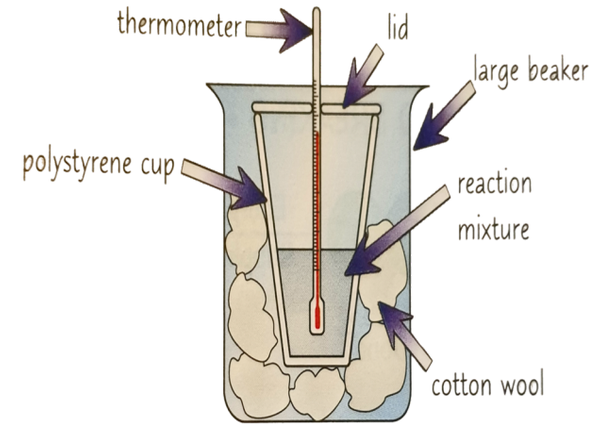
A Exothermic reactions

1	Conservation of energy	All energy is conserved in a reaction, In Exothermic reactions, energy is transferred to the surrounding, so the products must have less energy than the reactants.
2	Exothermic reaction (Hot)	Transfers energy to the surroundings. The temperature of surroundings increases. Uses of these reactions include hand warmers. Example: combustion reactions.
3	Exothermic reaction profile	
4	Endothermic reaction (Cold)	Absorbs energy from the surroundings. Temperature of surroundings decreases. Uses include sport injury cold packs. Example: thermal decomposition.
5	Endothermic reaction profile	
6	Activation energy	Minimum amount of energy needed to start a reaction.

C Energy changes of reactions

1	Breaking bonds	Energy is absorbed (endothermic)
2	Making bonds	Energy is released (exothermic)
3	Overall energy change =	= energy absorbed – energy released (LEFT- RIGHT)
4	How to explain the overall energy change	EXOTHERMIC: If more energy is released when new bonds are formed, than the energy absorbed to break bonds in the reactant molecules, the reaction is exothermic. ENDOTHERMIC: If more energy is absorbed in bond breaking than is released when new bonds are formed in the products, the reaction is endothermic.

B Measuring energy changes

1	Measuring Energy Changes practical	 <u>Measuring the energy change when salt is dissolved in water.</u> Lid is used because; - Exothermic: to minimise heat escaping the system - Endothermic: to minimise heat entering the system. Polystyrene cup acts as an insulator. **Independent variable** (what you are changing), e.g. mass of salt **Dependant variable** (What you are measuring), e.g. temperature change (difference between start and end temperature). **Control variables** (What needs to be kept the same for a fair test), e.g. volume of water.