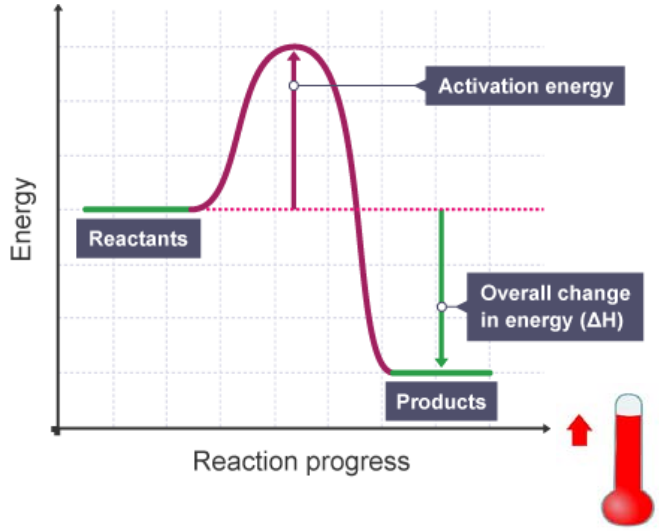
Chemistry Crib Sheet: Topic 5

In a reaction breaking bonds takes in energy.
In a reaction making new bonds releases energy.

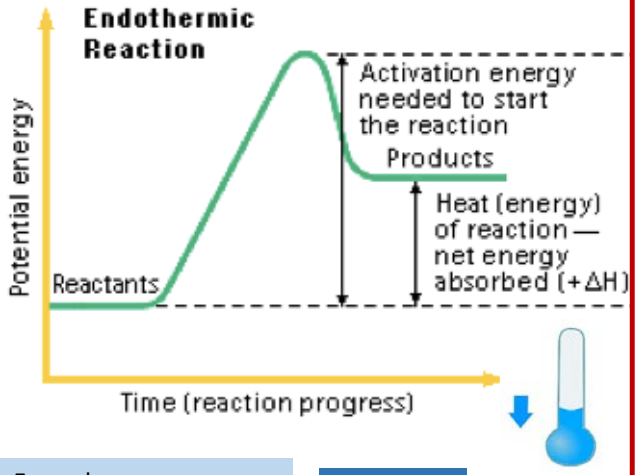
EXOthermic reactions release more energy forming new bonds than is taken in when old bonds are broken so overall give out energy.



Examples:
- Combustion
- Neutralisation
- Oxidation

Uses:
- **Hand warmers**
- **Self heating cans**

ENDOthermic reactions release less energy forming new bonds than is taken in when old bonds are broken so overall take in energy.



Examples:
- Thermal decomposition
- Reaction between citric acid + sodium hydrogencarbonate

Uses:
- **Sports injury packs**

Bond energies
Every bond has a different **energy** associated with it – e.g. you need 436kJ to break the bond between 2 hydrogen atoms (H-H). You can use these to calculate the **overall energy change** for a reaction

Core practical: How does the concentration of hydrochloric acid affect the amount of energy released when it is neutralised?
1. Add 25cm^3 of 0.25M HCl to 1 beaker and 25cm^3 of NaOH to another
2. Put them in a 25°C water bath
3. Mix the liquids
4. Take the temp every 30s using a thermometer
5. Record the highest temp
6. Repeat using different acid concentrations (e.g. 0.5M, 1.0M)

Use the apparatus shown below to prevent energy loss to the surroundings