Acid base reactions:

- neutralisation reactions; but not always.
- reactant/product pairs differ by H+
- Common acid base reaction types:
- acid + base = water + salt;
    - H2SO4(aq) + KOH (aq) = H2O (l) + K+LSO4 (aq)
- acid + carbonate = water + carbon dioxide + salt
    - think of 2 step process (looks like single step)
    - 2HCl(aq) + K2CO3 (aq) = ~~H2CO3(aq)~~ (**H2O(l) + CO2(g))** + 2KCl(aq)

Oxidation-reduction (redox) reactions:

- historical names:
    - oxidation: combination of an element with oxygen
    - reduction: reduce oxygen content
    - modern definition:
        - oxidation: **O**xidation **I**s **L**oss of electrons
        - reduction: **R**eduction **I**s **G**ain of electrons (**OIL RIG)**
- reducing agent: a reactant that causes a reduction in another reactant by giving up electron to it
    - undergoes oxidisation
    - caused reduction
    - loses one or more electrons
    - becomes more positive (less negative)
    - (may gain oxygen atoms)
    - the charge of the reducing agent increases during the reaction
- oxidising agent: a reactant that causes an oxidation by taking electrons from another reactant
        - undergoes reduction
        - gains one or more electrons
        - causes oxidation
        - becomes more negative (less positive)
        - (may lose oxygen atoms)
        - the charge of the oxidising agent decreases during the reaction
    - *increased charge = oxidised*
    - *decreased/reduced charge = reduction*
- recognising redox reactions:
    - oxidation number:
        - compare the oxidation number of an atom before and after a reaction
        - method of counting electrons: indicated whether the atom is neutral, electron-rich or electron poor
        - note; oxidation numbers do not necessarily imply ionic charges
    - oxidation number rules:
        - an atom in its elemental state has an oxidation number of zero (0)
        - a monatomic ion has an oxidation number equal to its charge
            - oxidation number +1 —> Na+

        - oxidation number +2 —> Ca2+
        - oxidation number -1 —> Cl-
        - oxidation number -2 —> O2-
    - in a molecular compound, an atom usually has the same oxidation number it could have if it were a monatomic ion
    - the sum of the oxidation numbers in a neutral compound is zero (0)

Net Ionic Equations:

- molecular equations:
    - molecular formulas
        - H2SO4 (aq) + KOH (aq) = H2O (l) + KHSO4 (aq)
    - ionic equation
        - ionic species shows an ions
        - spectator ions uncharged in reaction
        - net ionic equations remove spectator ions