# AQA A Level Chemistry Pre-Reading List

## 1. Atomic Structure

* Goals:
* Understand the structure of the atom, mass spectrometry, and electron configuration.
* Key Concepts:
* Relative atomic mass and isotopes
* Time of flight (TOF) mass spectrometry
* Electronic structure (s, p, d orbitals)
* Resources:
* Chemguide: Atomic Structure – <https://www.chemguide.co.uk/atoms/properties/atomstruct.html>
* YouTube: MaChemGuy – Atomic Structure <https://www.youtube.com/watch?v=c4Evj1ZngJ0>

## 2. Amount of Substance

* Goals:
* Master mole calculations and chemical equations.
* Key Concepts:
* The mole, molar mass, Avogadro’s constant
* Empirical and molecular formulae
* Ideal gas equation and titration calculations
* Resources:
* Isaac Chemistry: Mole Calculations Practice – <https://isaacchemistry.org>
* Chemguide: Moles and Equations – <https://www.chemguide.co.uk/physical/basicstoich/index.html>

## 3. Bonding

* Goals:
* Understand ionic, covalent, and metallic bonding, and molecular shapes.
* Key Concepts:
* Electronegativity and polarity
* Intermolecular forces (van der Waals, hydrogen bonding)
* Shapes of molecules (VSEPR theory)
* Resources:
* Chemguide: Bonding – <https://www.chemguide.co.uk/atoms/bondingmenu.html>
* Allergy Chemistry Youtube – Bonding - <https://www.youtube.com/watch?v=Mx8Gb5xewYI>

## 4. Energetics

* Goals:
* Understand enthalpy changes and Hess’s Law.
* Key Concepts:
* Exothermic and endothermic reactions
* Standard enthalpy changes (formation, combustion)
* Bond enthalpies and Hess cycles
* Resources:
* Chemguide: Enthalpy Changes – <https://www.chemguide.co.uk/physical/energetics/menu.html>
* YouTube: Allery Chemistry – Energetics <https://www.youtube.com/watch?v=3CausYwwrFo>

## 5. Kinetics

* Goals:
* Learn about reaction rates and collision theory.
* Key Concepts:
* Factors affecting rate (temperature, concentration, surface area, catalysts)
* Maxwell-Boltzmann distribution
* Activation energy
* Resources:
* Allery chemistry – Youtube – Kinetics <https://www.youtube.com/watch?v=BgvqafJplTE&list=PLX4e2DxFRGQKmHRsqKUim-3TQ77kYP6Kc&index=5>
* Chemguide: Kinetics – <https://www.chemguide.co.uk/physical/basicrates/menu.html>

## 6. Chemical Equilibria

* Goals:
* Understand dynamic equilibrium and Le Chatelier’s Principle.
* Key Concepts:
* Reversible reactions
* Position of equilibrium
* Equilibrium constant (Kc)
* Resources:
* Chemguide: Equilibria – <https://www.chemguide.co.uk/physical/equilibria/menu.html>
* Allery chemistry – Equilibria - <https://www.youtube.com/watch?v=mHnQypDGBzQ&list=PLX4e2DxFRGQKmHRsqKUim-3TQ77kYP6Kc&index=6>

## 7. Introduction to Organic Chemistry

* Goals:
* Learn basic organic chemistry principles and nomenclature.
* Key Concepts:
* Naming alkanes, alkenes, alcohols, halogenoalkanes
* Isomerism (structural and stereoisomerism)
* Functional groups and homologous series
* Resources:
* Chemguide: Organic Chemistry – <https://www.chemguide.co.uk/orgmenu.html>
* Allery chemistry – Introduction into Organic Chemistry - <https://www.youtube.com/watch?v=PwqRBrAK9RM&list=PLX4e2DxFRGQKmHRsqKUim-3TQ77kYP6Kc&index=11>