



MAGHULL HIGH SCHOOL – CURRICULUM MAP

Unit: Atomic Structure	1. Fundamental particles	2. Mass number and isotopes	3. Electron configuration
LESSONS			
Knowledge & Skills Development	<ul style="list-style-type: none"> • Appreciate that knowledge and understanding of atomic structure has evolved over time. • Describe protons, neutrons and electrons in terms of relative charge and relative mass. • Know that an atom consists of a nucleus containing protons and neutrons surrounded by electrons. • Refer to mass number as (A) and atomic (proton) number as (Z). • Determine the number of fundamental particles in atoms and ions using mass number, atomic number and charge • Explain the existence of isotopes. • Describe the principles of a simple time of flight (TOF) mass spectrometer, limited to ionisation, acceleration to give all ions constant kinetic energy, ion drift, ion detection, data analysis. • Know that a mass spectrometer gives accurate information about relative isotopic mass and also about the relative abundance of isotopes. 		<ul style="list-style-type: none"> • Know that mass spectrometry can be used to identify elements. • Know that mass spectrometry can be used to determine relative molecular mass. • Interpret simple mass spectra of elements • Calculate relative atomic mass from isotopic abundance, limited to mononuclear ions. • Write electron configurations of atoms and ions up to Z = 36 in terms of shells and sub-shells (orbitals) s, p and d. • Know what ionisation energies are. • Define first ionisation energy • Write equations for first and successive ionisation energies • Explain how first and successive ionisation energies in Period 3 (Na–Ar) and in Group 2 (Be–Ba) give evidence for electron configuration in sub-shells and in shells.
Assessment / Feedback Opportunities	Formative Assessment Teacher questioning Quizzes Exam style questions		Summative assessment End of topic assessment Exam questions in future end of topic assessments to assess recall
Key Vocabulary	Proton, Neutron, Electron, Atomic number, Molecular number, Isotope, Spectrometry, Electron configuration, Ionisation energy, Sub shell, Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest, Absolute, Uncertainty, Error		

Literacy/Reading Opportunities	Subject specific vocabulary introduced before reading of related texts Word etymology from Latin and Greek roots Reading of simple and complex sentences, paragraphs, articles Scientific writing including structuring methods, comparisons and evaluations
Cross Curricular Themes	Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators, significant figures
Personal Development (Including British Values, RSE, Citizenship)	None
Career Opportunities	Materials scientist, nuclear scientist, atomic engineering, software developer (mass spec), service engineer (mass spec), forensic scientist