YEAR 13 CHEMISTRY

MAGHULL HIGH SCHOOL – CURRICULUM MAP

Unit: **Inorganic Chemistry** **LESSONS**	1. Classification 2. Physical properties of Period 3 elements 3. Group 2 alkaline earth metals 4. Group 7 the halogens 5. Group 7 trends in properties 6. Use of chlorine and chlorate	7. Required practical 4 8. Properties of period 3 elements and their oxides 9. General properties of transition metals 10. Substitution reactions	11. Shapes of complex ions 12. Formation of coloured ions 13. Variable oxidation states 14. Catalysts 15. Reactions of ions in aqueous solutions 16. Required practical 11
Knowledge & Skills Development	• Explain the trends in atomic radius and first ionisation energy for each group • Explain the melting point of the elements in terms of their structure and bonding for each group • Explain why $BaCl_2$ solution I used to test for sulfate ions and why it is acidified. • Describe and explain uses of compounds of group 2 elements • Explain the trend in electronegativity of the halogens • Explain why silver nitrate solution is used to identify halide ions • Explain why the silver nitrate solution is acidified • Explain why ammonia solution is added. • Describe reactions of chlorine and chlorate with water • Uses of chlorine • Carry out simple test-tube reactions to identify: cations – Group 2, NH_4^+ anions – Group 7 (halide ions), OH^-, CO_3^{2-}, SO_4^{2-} • Explain the trend in the melting point of the oxides of the elements Na–S in terms of their structure and bonding • Explain the trends in the reactions of the oxides with water in terms of the type of bonding present in each oxide • Write equations for the reactions that occur between the oxides of the elements Na–S and given acids and bases. • Explain the characteristics of elements Ti-Cu • Explain the chelate effect, in terms of the balance between the entropy and enthalpy change in these reactions.		• Understand and draw the shape of complex ions. • Draw cis–trans and optical isomers. • Describe the types of stereoisomerism shown by molecules/complexes. • Determine the concentration of a solution from a graph of absorption versus concentration • Determine the concentration of a coloured complex ion by colorimetry. • Titrations of Fe^{2+} and $C_2O_4^{2-}$ with MnO_4^- and perform calculations for these titrations and similar redox reactions. • Explain the importance of variable oxidation states in catalysis • Explain, with the aid of equations, how V_2O_5 acts as a catalyst in the Contact process • Explain, with the aid of equations, how Fe^{2+} ions catalyse the reaction between I^- and $S_2O_8^{2-}$ • Explain, with the aid of equations, how Mn^{2+} ions autocatalyse the reaction between $C_2O_4^{2-}$ and MnO_4^- • Explain, in terms of the charge/size ratio of the metal ion, why the acidity of $[M(H_2O)_6]^{3+}$ is greater than that of $[M(H_2O)_6]^{2+}$ • Describe and explain the simple test-tube reactions of: M^{2+} (aq) ions, limited to M = Fe and Cu, and of M^{3+}(aq) ions, limited to M = Al and Fe, with the bases OH^-, NH_3 and CO_3^{2-} • Carry out simple test-tube reactions to identify transition metal ions in aqueous solution.
Assessment /	**Formative Assessment**		**Summative assessment**

Feedback Opportunities	Teacher questioning Quizzes Exam style questions	End of topic assessment Exam questions in future end of topic assessments to assess recall
Key Vocabulary	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	Chemical Engineering, Drug Development, Pharmacy, Forensic Scientist, Food Scientist, Environmental Consultant	