Science – Chemistry

MAGHULL HIGH SCHOOL – CURRICULUM MAP

	Lessons Sequence					
TOPIC (S) **CHEMICAL CHANGES**	1. The reactivity series 2. Extraction of metals and reduction 3. Oxidation and reduction 4. Reactions of acids with metals and metal compounds 5. Neutralisation 6. Soluble salts		7. Making copper sulphate (required practical) 8. The pH scale **9. Titrations (required practical)** 10. Strong and weak acids 11. The process of electrolysis		12. Electrolysis of molten ionic compounds 13. Electrolysis to extract metals 14. Electrolysis of aqueous solutions (including required practical) 15. Half equations	
Knowledge & Skills development	• Recall the reactions of specific metals to be able to place them in order of reactivity • Describe how metals of different reactivity are extracted from their ores • Describe oxidation and reduction in terms of the gain and loss of oxygen and the gain and loss of electrons • Knowledge of the products formed when metals and metal compounds react with hydrochloric, sulphuric or nitric acid • Understanding of the difference between acids, alkalis and bases • The use of the formulae of common ions to deduce the formulae of salts • Describe how to make pure, dry samples of named soluble salts • Describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution • Use the pH scale to identify acidic or alkaline solutions			• **Describe how to carry out titrations using strong acids and strong alkalis only to find the reacting volumes accurately** • **Calculate the chemical quantities in titrations involving concentrations in mol/dm^3 and in g/dm^3** • Use and explain the terms dilute and concentrated, and weak and strong in relation to acids • Describe the process of separating ionic substances using electrolysis • Predict the products of the electrolysis of binary ionic compounds in the molten state • Explain how aluminium is manufactured using electrolysis and why cryolite is added to the electrolyte • Predict what will be produced at each electrode in the electrolysis of aqueous solutions and links this to the reactivity of the elements involved • Use half equations to represent the reactions in electrolysis • Explain electrolysis in terms of oxidation and reduction	
Assessment / Feedback Opportunities	Targeted questioning throughout topic	Teacher assessment of practical skills during investigation - verbal	Knowledge Recall Quizzes	Deep marking of written task in students books	Topic Test	Targeted exam questions – teacher or self-assessed
Cultural Capital	• Use of acids and alkalis in cleaning products link to Unilever based locally on the Wirral					
SMSC / Promoting British Values **(Democracy, Liberty, Rule of Law, Tolerance & Respect)**	• Listening to others during presentations • Working in groups during practicals or research tasks					

Recommended Reading	• Recommended Read: Recovering Gold & Other Precious Metals from Electronic Scrap (Au Notes) • Recommended Read: All About Chemistry (Big Questions) (Robert Winston)
Key Vocabulary	Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest Reaction, Reactivity, Series, Oxidation, Reduction, Acid, Acidic, Alkali, Alkaline, Base, Basic, Salt, Neutralisation, Soluble, Insoluble, Excess, Filter, Evaporate, Ion, Formulae, Dilute, Concentrated, Electrolysis, Electrolyte, Electrode, Anode, Cathode, Separate
Digital Literacy	SharePoint resources including topic quizzes Possible use of excel to plot graphs and analyse data, powerpoint, word, etc to present information, internet for research
Cross-Curricular Links	Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators
Careers	Mining and metal work, Chemist, Chemical Engineering