YEAR 13 CHEMISTRY

MAGHULL HIGH SCHOOL – CURRICULUM MAP

Unit: **Electrochemical Cells and Acids and Bases** **LESSONS**	1. Electrode potentials and cells 2. Required practical 8 3. Commercial applications of electrochemical cells	4. Bronsted-Lowry acid-base equilibria in aqueous solution 5. pH 6. The ionic product of water, K_w	7. Weak acids and bases K_a for weak acids 8. pH curves, titrations and indicators 9. Required practical 9 10. Buffer action
Knowledge & Skills Development	• IUPAC convention for writing half-equations for electrode reactions. • use $E^{\ominus}$ values to predict the direction of simple redox reactions • Calculate the EMF of a cell • Write and apply the conventional representation of a cell • Measuring the EMF of an electrochemical cell • Use given electrode data to deduce the reactions occurring in non-rechargeable and rechargeable cells • Deduce the EMF of a cell • Explain how the electrode reactions can be used to generate an electric current. • Acid–base equilibria involve the transfer of protons. • Convert concentration of hydrogen ions into pH and vice versa	• Calculate the pH of a solution of a strong acid from its concentration. • Use KW to calculate the pH of a strong base from its concentration. • Construct an expression for Ka • Perform calculations relating the pH of a weak acid to the concentration of the acid and the dissociation constant, Ka • Convert Ka into pKa and vice versa. • Sketch and explain the shapes of typical pH curves • Use pH curves to select an appropriate indicator • Investigate how pH changes when a weak acid reacts with a strong base and when a strong acid reacts with a weak base. • Explain qualitatively the action of acidic and basic buffers • Calculate the pH of acidic buffer solutions.	
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	Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest, Absolute, Uncertainty, Error Electrodes, half-cell, electromotive force, hydrogen fuel cell, electro potential, rechargeable, redox, oxidation, reduction, neutralisation, pH, logarithm, titration		
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, logarithms
Personal Development (Including British Values, RSE, Citizenship)	None
Career Opportunities	Chemical Engineering, Drug Development, Pharmacy, Forensic Scientist, Food Scientist, Environmental Consultant