YEAR 12 CHEMISTRY

MAGHULL HIGH SCHOOL – CURRICULUM MAP

Unit: **Kinetics** **LESSONS**	1. Collision theory 2. Maxwell-Boltzmann distribution	3. Effect on temperature on reaction rate 4. Effect of concentration and pressure	5. Catalysts
Knowledge & Skills Development	• Know reactions can only occur when collisions take place between particles having sufficient energy. • Define activation energy. • Explain why most collisions do not lead to a reaction • Draw and interpret Maxwell–Boltzmann distribution curves of molecular energies in gases • Describe the meaning of the term rate of reaction. • Describe the qualitative effect of temperature changes on the rate of reaction. • Use the Maxwell–Boltzmann distribution to explain why a small temperature increase can lead to a large increase in rate. • **Required practical 3** Investigation of how the rate of a reaction changes with temperature. • Investigate the effect of temperature on the rate of reaction of sodium thiosulfate and hydrochloric acid by an initial rate method. • Investigate how knowledge and understanding of the factors that affect the rate of chemical reaction have changed methods of storage and cooking of food.	• Describe the qualitative effect of changes in concentration on collision frequency. • Describe the qualitative effect of a change in the pressure of a gas on collision frequency. • Explain how a change in concentration or a change in pressure influences the rate of a reaction. • Investigate the effect of changing the concentration of acid on the rate of a reaction of calcium carbonate and hydrochloric acid by a continuous monitoring method. • Know a catalyst is a substance that increases the rate of a chemical reaction without being changed in chemical composition or amount. • Describe that catalysts work by providing an alternative reaction route of lower activation energy. • Ua Maxwell–Boltzmann distribution to help explain how a catalyst increases the rate of a reaction involving a gas.	
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	Collision, Maxwell-Boltzmann, activation energy, continuous monitoring, initial rate, catalyst, frequency, 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 technician, brewmaster, clinical chemist