

# Yr12 Chemistry – Unit 3.1

## MAGHULL HIGH SCHOOL – CURRICULUM MAP



	Sequence				
<b>TOPIC (S)</b>  <b>KINETICS</b>	1. Collision theory 2. Maxwell-Boltzmann distribution		3. Effect on temperature on reaction rate 4. Effect of concentration and pressure		5. Catalysts
<b>Knowledge &amp; Skills development</b>	<ul style="list-style-type: none"> <li>Know reactions can only occur when collisions take place between particles having sufficient energy.</li> <li>Define activation energy.</li> <li>Explain why most collisions do not lead to a reaction</li> <li>Draw and interpret Maxwell–Boltzmann distribution curves of molecular energies in gases</li> <li>Describe the meaning of the term rate of reaction.</li> <li>Describe the qualitative effect of temperature changes on the rate of reaction.</li> <li>Use the Maxwell–Boltzmann distribution to explain why a small temperature increase can lead to a large increase in rate.</li> <li><b>Required practical 3</b> Investigation of how the rate of a reaction changes with temperature.</li> <li>Investigate the effect of temperature on the rate of reaction of sodium thiosulfate and hydrochloric acid by an initial rate method.</li> <li>Investigate how knowledge and understanding of the factors that affect the rate of chemical reaction have changed methods of storage and cooking of food.</li> </ul>			<ul style="list-style-type: none"> <li>Describe the qualitative effect of changes in concentration on collision frequency.</li> <li>Describe the qualitative effect of a change in the pressure of a gas on collision frequency.</li> <li>Explain how a change in concentration or a change in pressure influences the rate of a reaction.</li> <li>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.</li> <li>Know a catalyst is a substance that increases the rate of a chemical reaction without being changed in chemical composition or amount.</li> <li>Describe that catalysts work by providing an alternative reaction route of lower activation energy.</li> <li>Use a Maxwell–Boltzmann distribution to help explain how a catalyst increases the rate of a reaction involving a gas.</li> </ul>	
<b>Assessment / Feedback Opportunities</b>	Exam questions – teacher assessed	Exam questions – self assessed	Extended writing task – teacher assessed	Deep marking of required practical in lab books	Topic assessment
<b>Cultural Capital</b>	<ul style="list-style-type: none"> <li></li> <li></li> </ul>				
<b>SMSC / Promoting British Values</b> (Democracy, Liberty, Rule of Law, Tolerance & Respect)	<ul style="list-style-type: none"> <li>Importance of knowledge of rates of reaction in terms of economics and our environment</li> </ul>				
<b>Reading opportunities</b>	<ul style="list-style-type: none"> <li>Recommended Read: Chemical Reactions, Kristi Lew</li> </ul>				

<b>Key Vocabulary</b>	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
<b>Digital Literacy</b>	The use of a data logger and colorimeter to measure rate MSOffice35 apps including SharePoint
<b>Cross-Curricular Links</b>	Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators
<b>Careers</b>	Chemical technician, brewmaster, clinical chemist