

Meden School Curriculum Planning							
Subject	Chemistry	Year Group	12	Sequence No.		Topic	3.1.5 Kinetics

Retrieval	Core Knowledge	Student Thinking
What do teachers need to retrieve from students before they start teaching new content ?	What specific ambitious knowledge do teachers need to teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'
GCSE AQA C6 Rates of reactions	<p>3.1.5.1 Collison Theory Reactions can only occur when collisions take place between particles having sufficient energy. This energy is called the activation energy. Students should be able to:</p> <ul style="list-style-type: none"> • define the term activation energy • explain why most collisions do not lead to a reaction. <p>3.1.5.2 Maxwell-Boltzmann Distribution</p> <ul style="list-style-type: none"> ▪ Maxwell–Boltzmann distribution of molecular energies in gases and is a graph of number of particles against molecular energy. ▪ No particle has zero energy ▪ Most particles have intermediate energies (displayed around the peak of the curve) ▪ Few particles have very high energies (displayed on the right-hand side of the curve) ▪ The average energy is not the same as the most probable energy ▪ The peak of the graph, is the most common amount of molecules which are at an average speed of movement ▪ Increasing the temperature shifts the peak to the right but flattens the curve, the area under the graph remains the same as it represents the total number of particles. 	

	<p>Students should be able to draw and interpret distribution curves for different temperatures.</p> <p>3.1.5.3 Effect of temperature on Reaction Rate Meaning of the term rate of reaction. Rate of disappearance of a reactant or rate of appearance of a product. Rate = amount of product /time or amount of reactant/time The qualitative effect of temperature changes on the rate of reaction. On average an increase of 10°C doubles the rate. Adding the E_a to a Maxwell-Boltzmann graph, only particles to the right of the E_a have sufficient energy to react. Students should be able to use the Maxwell–Boltzmann distribution to explain why a small temperature increase can lead to a large increase in rate.</p> <p>Required practical 3 Investigation of how the rate of a reaction changes with temperature. Students could investigate the effect of temperature on the rate of reaction of sodium thiosulfate and hydrochloric acid by an initial rate method.</p> <p>3.1.5.5 Catalysts A catalyst is a substance that increases the rate of a chemical reaction without being changed in chemical composition or amount. Catalysts work by providing an alternative reaction route of lower activation energy. Students should be able to use a Maxwell–Boltzmann distribution to help explain how a catalyst increases the rate of a reaction involving a gas.</p>	<p>Research opportunity Students could investigate how knowledge and understanding of the factors that affect the rate of chemical reaction have changed methods of storage and cooking of food.</p>
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