

Subject	Year 9 Chemistry Threshold Concepts – Summer Term	• How to support students' learning
Rates of reaction	<p>Calculating rates of reaction</p> <ul style="list-style-type: none"> • Calculate the mean rate of reaction from given information about the quantity of a reactant used or the quantity of a product formed and the time taken • Draw, and interpret graphs showing the quantity of product formed or quantity of reactant used up against time • Draw tangents to the curves of these graphs and use the slope of the tangent as a measure of the rate of reaction <p><i>•HT ONLY Calculate the gradient of a tangent to the curve on these graphs as a measure of rate of reaction at a specific time</i></p> <p>Factors which affect the rates of chemical reactions</p> <ul style="list-style-type: none"> • Recall how changing these factors affects the rate of chemical reactions. <p>Collision theory and activation energy</p> <ul style="list-style-type: none"> • Predict and explain using collision theory the effects of changing conditions of concentration, pressure and temperature on the rate of a reaction 	<ul style="list-style-type: none"> • How to support students' learning • Encourage your child to watch this video on how to calculate the rate of a reaction using a graph GCSE Chemistry - How to Calculate the Rate of Reaction - Measuring Rate of Reaction #48 - YouTube • Encourage your child to visit BBC bitesize to learn about the factors that can affect the rate of a chemical reaction Rate of reaction - Rates of reaction - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize

	<ul style="list-style-type: none"> • Predict and explain the effects of changes in the size of pieces of a reacting solid in terms of surface area to volume ratio • Use simple ideas about proportionality when using collision theory to explain the effect of a factor on the rate of a reaction. <p>Catalysts</p> <ul style="list-style-type: none"> • Identify catalysts in reactions from their effect on the rate of reaction and because they are not included in the chemical equation for the reaction. • Explain catalytic action in terms of activation energy. 	<ul style="list-style-type: none"> • Encourage your child to read about a catalyst and what a catalyst can do to a reaction Catalysts - Rates of reaction - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize
Chemistry of the atmosphere	<p>The proportions of different gases in the atmosphere</p> <ul style="list-style-type: none"> • Recall the proportions of different gases in the atmosphere <p>The Earth's early atmosphere</p> <ul style="list-style-type: none"> • Interpret evidence and evaluate different theories about the Earth's early atmosphere <p>How oxygen increased</p>	<ul style="list-style-type: none"> • • Encourage your child to watch this video on how Earth's atmosphere has changed over time GCSE Chemistry - Evolution of the Atmosphere #67 - YouTube

- Describe the processes that lead to an increase in oxygen in the atmosphere

How carbon dioxide decreased

- Describe the main changes in the atmosphere over time and some of the likely causes of these changes
- Describe and explain the formation of deposits of limestone, coal, crude oil and natural gas

Greenhouse gases

- Describe the greenhouse effect in terms of the interaction of short and long wavelength radiation with matter

Human activities which contribute to an increase in greenhouse gases in the atmosphere

- Recall two human activities that increase the amounts of each of the greenhouse gases carbon dioxide and methane
- Evaluate the quality of evidence in a report about global climate change given appropriate information
- Describe uncertainties in the evidence base

- Encourage your child to visit the Centre for Science education website to read about the gases in the atmosphere and atmospheric pollution [What's In the Air? | Center for Science Education \(ucar.edu\)](http://www.ucar.edu/education/what-in-the-air)

- Encourage your child to visit BBC bitesize to learn about combustion and burning fuels [What is combustion? - BBC Bitesize](http://www.bbc.com/bitesize/chemistry/combustion)

- Recognise the importance of peer review of results and of communicating results to a wide range of audiences

Global climate change

- Describe briefly four potential effects of global climate change
- Discuss the scale, risk and environmental implications of global climate change

The carbon footprint and its reduction

- Describe actions to reduce emissions of carbon dioxide and methane
- Give reasons why actions may be limited

Atmospheric pollutants from fuels

- Describe how carbon monoxide, soot (carbon particles), sulfur dioxide and oxides of nitrogen are produced by burning fuels
- Predict the products of combustion of a fuel given appropriate

- Encourage your child to watch this video on air pollution [Air Pollution | Video for Kids | Causes, Effects & Solution - YouTube](#)

information about the composition of the fuel and the conditions in which it is used

Properties and effects of atmospheric pollutants

- Describe and explain the problems caused by increased amounts of these pollutants in the air