

KS3 Chemistry – Chemical Reactions – Learning Objectives

NB. Some areas of this topic may be omitted due to time constraints.

	Beginning	Developing	Secure	Embedding	Extending	Excelling
Energy Changes	Describe the ways in which energy can be given out during a chemical reaction.	Explain the differences between an exothermic reaction and an endothermic reaction. Recall that a chemical reaction stops when one of the reactants has run out, and that no more energy is transferred from this point.		Discuss some practical applications of exothermic and endothermic reactions	Discuss exothermic and endothermic reactions in terms of energy applied to break chemical bonds and energy released in order to form new bonds.	
Gases and Atmosphere	Name the four most abundant gases in our atmosphere, and give the proportions of each gas.	Recall some of the uses of the most abundant gases in our atmosphere.	Describe and perform the laboratory tests for the presence of hydrogen, oxygen and carbon dioxide. Describe some experiments that prove that approx. one-fifth of our atmosphere is oxygen.		-	-
Combustion	Recall that oxygen is required for burning.	Recognise the reasons for burning fuels. Explain the similarities and differences between oxidation and combustion (burning).	Describe how oxides form. Write word equations (and simple symbol equations) for the oxidation / combustion of metals and hydrocarbons. Explain the differences between complete and incomplete combustion of fuels.		Construct balanced symbol equations for the combustion of metals and hydrocarbons. Discuss the consequences of the products of complete and incomplete combustion of fuels.	
Fire Safety	Recall the three items found in the 'fire triangle'.	Explain that the removal of one side of the fire triangle will stop a fire, and suggest some ways in which this can be done.	Recognise the different types of fire extinguisher, and explain how they (and fire blankets) can be used to extinguish a fire.	Explain how a fire extinguisher may not be suitable for every type of fire, and discuss the consequences of using the incorrect type of extinguisher.	-	-
Other Types Of Reaction	-	In simple terms, explain what happens in a reduction reaction and a (thermal) decomposition reaction. Describe how to recognise if a precipitate has been formed.	Perform some laboratory experiments to demonstrate reduction, decomposition and precipitation reactions. Write the word (and symbol) equations for each of the chemical reactions, including the use of state symbols.		Discuss some real-world examples of reduction and decomposition reactions.	
Reaction Rates	-	Describe some of the variables that may affect the rate of a chemical reaction (eg. concentration, temperature, surface area), and suggest the effect of that variable. Explain why the rate of reaction decreases towards the end of a reaction. Explain the function of a catalyst in a chemical reaction.	Explain how a given variable affects the rate of a chemical reaction in terms of collision theory and activation energy.		-	

* Objectives covering more than one grade are assessed based on the level of scientific detail and language used by the learner.