C5 Energy Changes Learning Journey

What have I done previously in my learning journey?	
Previously….	**You have learnt previously about chemical reactions. This has involved learning about:** • Chemical reactions as the rearrangement of atoms. • Representing chemical reactions using formulae and using equations • Combustion, thermal decomposition, oxidation and displacement reactions • Defining acids and alkalis in terms of neutralisation reactions **You have also learnt previously about energetics. This has involved learning about:** • Energy changes on changes of state (qualitative) • Exothermic and endothermic chemical reactions (qualitative).
In this topic…	You will learn that energy changes are an important part of chemical reactions. The interaction of particles often involves transfers of energy due to the breaking and formation of bonds. Reactions in which energy is released to the surroundings are exothermic reactions, while those that take in thermal energy are endothermic.

We will develop our learning by studying the following each lesson:	RAG	Skills in Science checklist
C5.01 Exothermic and Endothermic Reactions • Describe the transfer of energy in exothermic and endothermic reactions • State examples and describe everyday uses of exothermic and endothermic reactions • Distinguish between exothermic and endothermic reactions based on the temperature change of the surroundings		☐ Scientific methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
C5.02 Temperature Changes (RP) • Investigate the variables that affect temperature changes in reacting solutions		☐ Scientific methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
C5.03 Reaction Profiles • Define the term 'activation energy' • Explain what must happen to the reacting particles in order for a chemical reaction to occur • Draw simple reaction profiles for exothermic and endothermic reactions • Use reaction profiles to identify reactions as exothermic or endothermic		☐ Scientific methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
C5.04 Bond Energies (HT Only) • Calculate the energy needed to break bonds and the energy released when bonds are formed using bond energies supplied • Calculate the overall energy change of a reaction • Describe how the energy released from forming new bonds compares to the energy needed to break existing bonds in exothermic and endothermic reactions		☐ Scientific methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication

Key Vocabulary

Exothermic	**Endothermic**	**Reaction profile**	**Activation energy**	**Bond energy**				

Future Learning	Studies for AS-level and A-level Chemistry involve a topic on 'Energetics'. This involves learning about: • Enthalpy changes, including standard enthalpy changes of reaction, formation and combustion. Average bond enthalpies • Use of Hess's law to calculate enthalpy changes • Use of energetics, including entropy, to predict the feasibility of reactions
In careers	Exothermic and endothermic chemical reactions can produce heating or cooling effects that are used in a range of everyday applications. Some interactions between ions in an electrolyte result in the production of electricity. Cells and batteries use these chemical reactions to provide electricity. These chemical reactions have led to developments in the car industry to further increase the numbers of electric cars in the road. Electricity can also be used to decompose ionic substances and is a useful means of producing elements that are too expensive to extract any other way. Chemical engineer - £35,771

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