**Year 10 GCSE Chemistry Outline Scheme of Work:** (*AQA Science A, Route 2* course of study)
To earn their GCSE Science A Qualification pupils sit two written module exams each covering topics in Biology, Chemistry and Physics in a single paper. The SCA1 exam is worth 35% of their science GCSE. The SCA2 exam is worth 40% of their science GCSE.
In addition pupils will sit practical exams during normal lesson times. The mark submitted for the practical exam will make up 25% of their overall GCSE grade in science.
The topics covered in their Chemistry lessons are set out below.

| Timings | Topics |
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| Term 1 | **1.1 The Fundamental Ideas in Chemistry**<br>In this topic pupils will learn about the structure of atoms and familiarise themselves with the chemical elements on the periodic table. Students will apply this knowledge to further understand how atoms form chemical bonds and use this to describe what happens during chemical reactions. |
| Term 2 | **1.2 Limestone and Building Materials**<br>In this topic students will learn about the many uses of limestone (calcium carbonate). Students will learn about the limestone cycle and how limestone may be used as a building block as it is a fundamental ingredient in making glass, cement, concrete and mortar. They will also learn about the chemical reactions of carbonates |
| | **1.3 . Metals and their uses**<br>In this topic students will learn about the different methods of extracting metal from ore. In particular, students will discover how iron is extracted by reduction with carbon, aluminium is extracted by electrolysis and copper is extracted by smelting. Students will also find out about new methods of extracting metals such as phytomining and bioleaching and how to alter the properties of metals by making them into alloys. |
| Term 3 | **1.4 Crude Oil and Fuels**<br>In this topic students will discover that crude oil is a mixture of useful hydrocarbons that can be separated by fractional distillation. Students will then find out how the different fractions of hydrocarbons have different properties and that some of them, called alkanes, are used as fuels. They will then learn about the gases produced in combustion of fuels and compare the impact that non-renewable fuels have against renewable fuels on the atmosphere |
| Term 4 | **1.5 Other useful substances from Crude Oil**<br>In this topic students will learn how long hydrocarbon chains may be 'cracked' into smaller molecules of alkanes and alkenes. Students will find out how alkanes may undergo a chemical reaction called polymerisation to form polymers (plastics). They will discover the many useful properties of plastics and evaluate the impact that plastics have on the environment. Students will also compare different methods of manufacturing ethanol. |
| | **1.6 Plant oils and their uses**<br>In this topic students will learn how vegetable oils are extracted and can be used for cooking. Other uses of vegetable oils will be investigated including making them into emulsions or hardening them to form margarine. Students will also learn how biodiesel fuel can be produced from vegetable oils. |
| Term 5 | **1.7 Changes in the Earth and its atmosphere**<br>Students will learn about the layered structure of the Earth. Students will discover how the Earth's surface and atmosphere have changed over time and how they continue to change. Students will learn about the composition of the current atmosphere and how human activities have resulted in further changes in the atmosphere. Students will also find out about the different scientific theories about how life was formed. |
| Term 6 | **AQA GCSE Core Science exams SCA1 and SCA2**<br><br>**N.B. Pupils begin their year 11 course of study following their exam in term 6.** |

# Year 11 Chemistry

Year 11 GCSE Chemistry Outline Scheme of Work: (*AQA Science A, Route 2* course of study)
To earn their GCSE Additional Science Qualification pupils sit two written module exams each covering topics in Biology, Chemistry and Physics in a single paper. The AS1 exam is worth 35% of their science GCSE. The AS2 exam is worth 40% of their science GCSE.
In addition pupils will sit practical exams during normal lesson times. The mark submitted for the practical exam will make up 25% of their overall GCSE grade in science.
The topics covered in their Chemistry lessons are set out below.

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| **Term 1** | **2.1 Chemical bonding**<br>Understanding chemical bonding is fundamental in understanding chemistry. In this topic students will learn about atomic structure and chemical bonding. Simple particle theory is developed in this topic to discover how electrons are arranged in atoms. This knowledge will be used to explain what happens when elements react and how atoms join together to form covalent, ionic and metallic substances. |
| | **2.2 Chemical properties**<br>The type of chemical bonding in a substance determines its properties. In this topic students will learn that substances that have simple molecular, giant ionic and giant covalent structures have very different properties. Students will discover that ionic, covalent and metallic bonds are strong while that the forces between simple covalent molecules are weaker. They will also look at how nanomaterials have new properties because of their very small size. |
| **Term 2** | **2.3 How much?**<br>Balanced chemical equations can be used to determine how much of a chemical you will need or how much will be made during a chemical reaction. In this topic students will use relative masses of atoms to calculate how much to react and how much is produced in a chemical reaction. Students will apply this knowledge to industrial processes and use this to explain why atom economy is important for sustainable development. |
| | **Revision**<br>Students will complete a range of revision activities in lessons. This should be supported with regular revision at home. |
| **Term 3** | **2.4 Rate of reaction**<br>Being able to speed up or slow down chemical reactions is important in everyday life and in industry. In this topic students will find out how changes in temperature, concentration of solutions, surface area of solids and the presence of catalysts all affect the rates of reactions. |
| | **2.5 Energy changes in chemical reactions**<br>Chemical reactions involve energy transfers. In this topic students will learn how in some chemical reactions energy is released (exothermic) while for other reactions to occur, energy must be supplied (endothermic). Students will apply this knowledge to industrial processes and consider the energy requirements and emissions of these processes for economic reasons and for sustainable development. |

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| | **Investigative skills assignment**<br>Students will complete over three lessons in which they will have to draw a table, conduct an experiment, graph their results and sit a test.<br>**25% of Additional science grade** |
| **Term 4** | **2.6 Electrolysis**<br>Ionic compounds have many uses and can provide other substances. In this topic pupils will learn about how electrolysis is used to produce alkalis and elements such as chlorine and hydrogen. Student will also discover that oxidation and reduction reactions do not just involve oxygen but a transfer of electrons. |
| | **2.7 Acids and alkalis**<br>Acids and alkalis may be used to make soluble and insoluble salts. In this topic students will learn about reactions of acids with metals, insoluble bases and alkalis. Students will also discover that in some acid-alkali reactions a precipitate will form. |
| **Term 5** | **Revision**<br>Students will complete a range of revision activities in lessons. This should be supported with regular revision at home. |
| | **AQA GCSE Additional Science exams AS1 and AS2** |