

CNCS

Year 11 Science: Curriculum Overview (Chemistry and Physics)

Rationale: In Year 11, students will build on prior knowledge from KS3 and KS4. After completing their Biology exam in Year 10 students will continue their development on their key foundation concepts in Chemistry and Physics. Students will continue to establish their required practical skills from the past years then apply it to GCSE questions. Students will revisit and be introduced to a range of specific subject terminology, learning how to identify and discuss this appropriately. Furthermore, students will be given opportunities to develop their own personal responses to scientific problems and consider how to apply their knowledge to them.

A learner in Year 11 will know/ have studied:

- **In Year 7,**
- **Chemistry:** C1: Atomic structure and the periodic table, C2: Bonding, structure and properties, C4: Chemical changes, C5: Energy changes;
- **Physics:** P1: Energy, P2: Electricity, P3: Particle model of matter.
- **In Year 8,**
- **Chemistry:** C6: Rates of reaction, C7: Organic Chemistry, C8: Chemical Analysis, C9 Chemistry of the atmosphere, C10 Using resources;
- **Physics:** P5: Forces, P6: Waves, P7: Magnets and P8 Space Physics
- **In Year 9**
- **Chemistry:** C1: Atomic Structure, C2: Bonding, C4: Chemical Changes, C5: Energy Changes, C6: Rate of reaction, C8: Chemical Analysis, C10: Using Resources
- **Physics:** P1: Energy, P3: Particle model of matter, P4: Atomic Structure, P6: Waves, P7; Magnetism, P8: Space Physics
- **In Year 10**
- **Biology:** B1: Cell Biology, B2: Organisation, B3: Infection and Response, B4: Bioenergetics, B5: Homeostasis, B6: Inheritance, B7: Ecology

A learner in Year 11 will be able to:

- Develop GCSE knowledge and practical skills in Chemistry and physics topics.
- Question, understand and apply the chemistry/ physics knowledge to real life problems and scenarios.
- Work safely in a lab and carry out investigations

Term	Outline	Assessment	Home Learning	Key Skills/ End Point
1	<p><u>C4 Chemical changes</u></p> <ul style="list-style-type: none"> - Describe how metal oxides are formed and when metals react with acids - Describe how the reactivity series are arranged - Describe when acid reacts with alkali (neutralisation) - Investigate how to produce soluble salt - Describe the pH scale and <i>strong/weak acids (HT only)</i> 	<p><u>1.1 & 1.2 Pit stops</u></p> <p>C4 Chemical changes (HA & LA) pit stop 1 C4 Chemical changes (HA & LA) pit stop 2 P2 Electricity (HA & LA) pit stop 1 P2 Electricity (HA & LA) pit stop 1 C3 Quantitative Chemistry (HA & LA) pit stop 1</p>	<p>Set once per week via homework knowledge recall booklets</p>	<p>Students are able to recall key knowledge and apply this knowledge to exam questions from different areas.</p> <p>Students will interpret and then describe and explain what graphs show with reference to the data collected for a range of contexts.</p>

	<p>- Carry out titrations using strong acids/alkalis Describe electrolysis with molten and aqueous solution</p> <p><u>P2 Electricity</u> Students will investigate the fundamental property of electric charge and will analyse the principles behind modern circuits. Students will also discover the inner workings of the national grid and how electricity is distributed to homes and factories.</p> <p><u>C3 Quantitative Chemistry</u> Students will use quantitative analysis skills to determine the purity of chemical samples. These observations will allow students to classify these reactions based on patterns and predictions on their behaviour</p> <p><u>P5 Forces</u> Students will analyse forces in a variety of machines and instruments. They will be able to describe how these machines are used in modern life.</p>	<p>P5 Forces (HA & LA) pit stop 1</p> <p>Mock assessment 1 to focus on topics taught in year 9</p>		<p>Students are able to analyse information given to them, and apply their knowledge gained through the course to evaluate data provided</p>
<p>2</p>	<p><u>C10 Using resources</u> Student will be able to:</p> <ul style="list-style-type: none"> - Describe what sustainable development is - Describe the difference between potable and pure water - Investigate ways to purify water and analyse the results - Discuss how we obtain potable water from waster/ground and salt water 	<p><u>2.1 & 2.2 Pit stops</u></p> <p>P5 Forces (HA & LA) pit stop 2 C10 Using resources (HA & LA) pit stop 1 P7 Magnets & Electromagnets (HA & LA) pit stop 1 P8 Space Physics (HA & LA) pit stop 1 C9 Chemistry of the atmosphere (HA & LA) pit stop 1 C6 Rates of reaction (HA & LA) pit stop 1</p>	<p>Set once per week via homework knowledge recall booklets</p>	<p>Students are able to recall key knowledge and apply this knowledge to exam questions from different areas.</p> <p>Students will interpret and then describe and explain what graphs show with reference to the data collected for a range of contexts.</p>

<ul style="list-style-type: none"> - Evaluate alternative methods of metal extraction (HT only) - Understand the stage so life cycle assessments. - Evaluate ways of reducing the use of limited resources - Investigate the conditions for rusting - Evaluate the composition and uses of alloy - Compare the differences between thermosoftening and thermosetting polymers - Describe the Haber process (HT and LT) and apply equilibrium to Haber process (HT only) - Compare the industrial production of fertilisers (NPK) in compounds <p><u>P7 Magnetism and electromagnetism</u> Students will be able to:</p> <ul style="list-style-type: none"> - Describe how a magnet works and interact - Explain what a solenoid is and how they work - Describe how the magnetic effect of a current can be demonstrated and draw a magnetic field pattern - Apply Fleming’s left-hand rule (HT only) - Explain what is the motor effect (HT only) - Describe the generator effect (HT only) <p>Describe how a transformer works (HT only)</p> <p><u>P8 Space Physics; covered on “Space day”</u> Students will be able to:</p> <ul style="list-style-type: none"> - Describe the life cycle of a star - Explain how objects orbit - Explain Red shift and use as evidence for the Big Bang Theory <p><u>C9 Chemistry of the atmosphere covered on “Atmosphere day”</u></p>	<p>C7 Organic Chemistry (HA & LA) pit stop 1</p> <p>Mock assessment 2 to focus on paper 1</p> <p>Mock assessment 3 to focus on paper 2</p>		<p>Students are able to analyse information given to them, and apply their knowledge gained through the course to evaluate data provided.</p>
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	<p>Students will discover Earth's atmosphere and how it is forever changing. Students will study the complex problems we face and the possible solutions to them.</p> <p><u>C6 Rate of reaction</u></p> <p>Students will be able to:</p> <ul style="list-style-type: none"> - Calculate the rate of reaction - Understand the factors that affect rate of reaction and explain using collision theory, activation energy and catalyst - Investigate the effect of concentration on the rate of reaction - Describe reversible reactions and energy changes <p>Understand the rules of equilibrium and predict the effects on given reactions. (HT only)</p> <p><u>C7 Organic Chemistry</u></p> <p>Students will investigate the variety of carbon compounds. This will branch into organic compounds studying compounds that are living, or once living.</p>			
3	<p>Students will have now finished their GCSE content and will begin revision, starting with Year 9 content.</p>	<p>3.1 & 3.2 Pit stops Bespoke to the needs of the class</p> <p>3.2 End Assessment External GCSE assessment</p>		