

## Walthamstow Academy – Science Curriculum Journey

Half Term	Curriculum Content	Assessment(s) (assessment title, duration and approx date)	Extra-Curricular Options (Places to visit; wider reading; clubs to join)
<p><b>Year 7 Science Curriculum Overview:</b>  <i>In Year 7, students start their KS3 curriculum journey by studying the big ideas of science. The focus of KS3 science is to develop a deeper understanding of a range of scientific ideas in all three sciences. Year 7 begins by understanding the key blocks of knowledge and concepts to progress to the next stages in Y8 and Y9 and eventually building upon these concepts at KS4. There is also a large focus on working scientifically and objectively and developing their scientific vocabulary. The topics studied in Year 7 are: 7.01 Particles, 7.02 Fundamentals of Physics, 7.03 Cells &amp; Organisation, 7.04 Chemical Changes, 7.05 Organ Systems, 7.06 Sound and Light, 7.07 Materials and 7.08 Life Cycles</i></p> <p><b>Wider Reading:</b>  <a href="https://www.sciencejournalforkids.org/">https://www.sciencejournalforkids.org/</a>            Wow science <a href="https://wowscience.co.uk/">https://wowscience.co.uk/</a>  <a href="https://www.youtube.com/@bbcteach">https://www.youtube.com/@bbcteach</a>            One Zoo Three Series            Read articles in The Day or in New Scientistist</p>			
Year 7 HT1	<p><b>Particles</b> - Students will be introduced to working scientifically and how to work safely in a secondary science lab. Additionally, they will investigate how particles are the building blocks of our world.</p> <ul style="list-style-type: none"> <li>• Particle model of matter</li> <li>• Elements, compounds, and mixtures</li> <li>• Pure substances and mixtures</li> <li>• Solutions</li> <li>• Separating mixtures</li> </ul>	TOPIC TEST – 30 MINS	<p>Grow your own crystal e.g. salt  <a href="http://www.sciencekids.co.nz/projects/saltcrystals.html">http://www.sciencekids.co.nz/projects/saltcrystals.html</a></p>
Year 7 HT1/2	<p><b>Fundamentals of Physics</b> – Students will explore motion and the forces that alter it. They will then describe these as transfers of energy from different stores by work done by forces.</p> <ul style="list-style-type: none"> <li>• Describing forces</li> <li>• Describing friction</li> <li>• Energy stores</li> <li>• Energy transfers</li> <li>• Energy analysis</li> </ul>	TOPIC TEST – 30 MINS	<p>Visit the science museum and check out their energy hall.</p> <p>Go the Technicians: The Davud Dainsbury at the science museum to learn about being a wind turbine technician.</p> <p>London Transport Museum</p>
HT2	<p><b>Cells and Organisation</b> - Students will learn how to prepare slides, use microscopes and explain the differences between different types of living organisms.</p>	TOPIC TEST – 30 MINS	<p><a href="#">Visit the Medicine: The Wellcome Galleries at the Science Museum</a></p>

	<ul style="list-style-type: none"> <li>Life processes of organisms</li> <li>Cells, tissues, organs and systems</li> <li>Features of plant and animal cells</li> <li>Unicellular organisms</li> </ul>		
<b>HT3</b>	<p><b>Chemical Changes</b> – Students will learn the importance of chemical reactions, how these are used in industry and everyday life to benefit us.</p> <ul style="list-style-type: none"> <li>Chemical symbols and formulae</li> <li>Representing atom rearrangement</li> <li>Properties of elements</li> <li>Chemical change</li> <li>Observing chemical reactions</li> <li>Reactants and products</li> <li>Categorising reactions</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	Subscribe to the Whizz Pop Bang magazine; a new monthly children’s science magazine. <a href="https://www.whizzpopbang.com">https://www.whizzpopbang.com</a>
<p><b>PPE 1 will be 1 paper. Students will be assessed on the following:</b></p> <p><b>7.01 Particles</b></p> <p><b>7.02 Fundamentals of Physics</b></p> <p><b>7.03 Cells &amp; Organisation</b></p> <p><b>Revision resources can be found on Satchel One</b></p>			
<b>Year 7 HT3/4</b>	<p><b>Organ systems</b> – Students will study the parts, function and connections between the main organ systems in the body</p> <ul style="list-style-type: none"> <li>Gas exchange system in humans</li> <li>Digestive system in humans</li> <li>Circulatory system in humans</li> <li>Musculoskeletal system in humans</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	Natural History Museum
<b>Year 7 HT4</b>	<p><b>Sound and Light Waves</b> - The unit describes light and sound as waves that transfer energy, what happens when they meet different surfaces and how they can be observed.</p> <ul style="list-style-type: none"> <li>Observing sound</li> <li>Observing light</li> <li>General principles of radiation</li> <li>Sound as radiation</li> <li>Energy transfer by sound</li> <li>Light as radiation</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	<p>Visit the Exploring Space exhibition and the engineers exhibition at the Science Museum</p> <p>Visit the Royal Observatory in Greenwich!</p>

	<ul style="list-style-type: none"> <li>• Coloured light</li> <li>• Refraction of light</li> <li>• Hearing</li> <li>• Seeing</li> </ul>		
<b>Year 7 HT5</b>	<p><b>Materials</b>– Students explore the properties of some of the materials made from earth’s resources.</p> <ul style="list-style-type: none"> <li>• Composite materials</li> <li>• Properties of metals and non-metals</li> <li>• Ceramics</li> <li>• Polymers</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	Jobs that use Science <a href="https://www.bbc.co.uk/bitesize/groups/ce8q155gnd3t">https://www.bbc.co.uk/bitesize/groups/ce8q155gnd3t</a>
<b>Year 7 HT5</b>	<p><b>Life Cycles</b> - They will understand the changes that our bodies undergo and how the reproductive system works in plants and animals as well as how we inherit our characteristics.</p> <ul style="list-style-type: none"> <li>• Heredity and the genome</li> <li>• Growth and development</li> <li>• Sexual reproduction</li> <li>• Sexual reproduction in humans</li> <li>• Sexual reproduction in plants</li> <li>• Asexual reproduction</li> <li>• Variation</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	Visit Chessington or London Zoo to improve your knowledge of animals and their environments. <a href="https://www.zsl.org/zsl-london-zoo">https://www.zsl.org/zsl-london-zoo</a>
<b>Year 7 HT6</b>	<p><b>Plants their processes</b> -Students exploring the structure and function of roots, leaves and stems. Pupils then progress on to the process of photosynthesis and its importance</p> <ul style="list-style-type: none"> <li>• Plant Roots</li> <li>• Photosynthesis</li> <li>• Testing for starch</li> <li>• Adaptations of leaves</li> <li>• Transport in plants</li> <li>• Plants and atmosphere</li> <li>• Plants as producers</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	Check out all the amazing plants you can see at Kew Gardens!

**PPE 2 consists of 3 papers. Students will be assessed on the following:**

Biology: 7.03 Cells & Organisation, 7.05 Organ Systems

Chemistry: 7.01 Particles, 7.04 Chemical Changes

Physics: 7.02 Fundamentals of Physics, 7.06 Sound & Light

Term	Curriculum Content	Assessment(s) (assessment title, duration and approx date)	Extra-Curricular Options (Places to visit; wider reading; clubs to join)
<p><b>Year 8 Curriculum Overview:</b>  <i>In Year 8 students continue to go through the KS3 schemes of work, now building upon their basic knowledge and concepts and further deepening their understanding of science in the world. Students continue to develop their experimental and investigative skills. The topics studied in Year 8 are: 8.01 Heating and Cooling, 8.02 Earth &amp; the Atmosphere, 8.03 Forces &amp; Motion, 8.04 Plants &amp; their processes, 8.05 Electricity, 8.06 Interactions and Interdependence, 8.07 Forces &amp; Work, 8.08 Acids &amp; Alkalis, 8.09 Nutrition &amp; digestion, 8.10 Space</i></p> <p><b>Wider Reading:</b>  <a href="https://www.sciencejournalforkids.org/">https://www.sciencejournalforkids.org/</a>  Wow science <a href="https://wowscience.co.uk/">https://wowscience.co.uk/</a>  <a href="https://www.youtube.com/@bbcteach">https://www.youtube.com/@bbcteach</a>  One Zoo Three Series  Read articles in The Day or in New Scientist</p>			
<p><b>Year 8 HT1</b></p>	<p><b>Heating and Cooling</b> - In this unit, students use ideas about the particle model and energy transfer to describe and explain temperature and the cause of any change to it.</p> <ul style="list-style-type: none"> <li>• Temperature</li> <li>• Changing Energy</li> <li>• Conduction</li> <li>• Density</li> <li>• Convection</li> <li>• Radiation</li> </ul>	<p><b>TOPIC TEST – 30 MINS</b></p>	<p><i>“How Things Work: The Physics of Everyday Life”</i> by Louis A. Bloomfield  <i>“The Magic School Bus Gets Cold Feet”</i> by Joanna Cole  <i>“Energy Island: How One Community Harnessed the Wind and Changed Their World”</i> by Allan Drummond</p> <p>Science Museum London – Energy Revolution gallery  Natural History Museum – Climate and environment exhibits</p>
<p><b>Year 8 HT1</b></p>	<p><b>Earth and the atmosphere</b> - Students will begin by examining the internal structure of the Earth and the theory of continental drift before investigating the formation and characteristics of igneous, sedimentary and metamorphic rocks.</p> <ul style="list-style-type: none"> <li>• Earths atmosphere</li> <li>• Composition of the earth</li> <li>• Global Warming</li> <li>• Weathering</li> <li>• Rock formation</li> </ul>	<p><b>TOPIC TEST – 30 MINS</b></p>	<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• National Geographic Kids articles on climate and geology</li> <li>• <i>“Earth: Our Planet in Space”</i> by Seymour Simon</li> </ul> <p><b>Extra-Curricular Activities:</b></p> <ul style="list-style-type: none"> <li>• Natural History Museum Earth science exhibits <ul style="list-style-type: none"> <li>• London Wildlife Trust nature walks and conservation projects</li> <li>• Gardening club at WA</li> </ul> </li> </ul>

<p><b>Year 8 HT2</b></p>	<p><b>Forces and Motion</b> – In this unit, students develop their understanding of how forces affect the motion of objects. They learn to describe, measure, and predict the effects of forces, using key concepts such as balanced and unbalanced forces, speed, and acceleration.</p> <ul style="list-style-type: none"> <li>• Forces and their effects</li> <li>• Balanced and unbalanced forces</li> <li>• Speed and motion graphs</li> <li>• Gravity and weight</li> <li>• Friction, air resistance, and drag</li> </ul>	<p><b>TOPIC TEST – 30 MINS</b></p>	<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• <i>“Forces and Motion”</i> by Christopher Gordon</li> <li>• <i>“The Way Things Work Now”</i> by David Macaulay</li> </ul> <p><b>Extra-Curricular Activities:</b></p> <ul style="list-style-type: none"> <li>• Science Museum interactive exhibits on forces and machines <ul style="list-style-type: none"> <li>• STEM club at WA</li> </ul> </li> <li>• Building simple machines or bridges projects</li> </ul>
<p><b>PPE 1 is 1 paper. Students will be assessed on the following: (including Y7 topics)</b>  <b>8.01 Heating and Cooling, 8.02 Earth and the atmosphere, 8.03 Forces &amp; Motion</b>  <b>Revision resources posted on Satchel One and Seneca</b></p>			
<p><b>Year 8 HT2</b></p>	<p><b>Plants and Their Processes</b> – In this unit, students explore the structure and function of plants and how they carry out essential life processes. They gain an understanding of their vital role in ecosystems and food chains.</p> <ul style="list-style-type: none"> <li>• Parts and functions of a plant</li> <li>• Photosynthesis</li> <li>• Pollination and fertilisation</li> <li>• Seed dispersal and germination</li> <li>• Water and nutrient transport</li> <li>• The role of plants in ecosystems</li> </ul>	<p><b>TOPIC TEST – 30 MINS</b></p>	<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• <i>“The Hidden Life of Trees”</i> by Peter Wohlleben</li> <li>• Royal Botanic Gardens, Kew website articles</li> </ul> <p><b>Extra-Curricular Activities:</b></p> <ul style="list-style-type: none"> <li>• Visit Kew Gardens and London Wetland Centre <ul style="list-style-type: none"> <li>• Gardening club</li> </ul> </li> </ul>
<p><b>Year 8 HT3</b></p>	<p><b>Electricity</b> – In this unit, students develop their understanding of current electricity, circuits, and energy transfer. They explore how components behave in series and parallel circuits, learn how to represent circuits using symbols, and use equations to calculate current, potential difference, and resistance.</p> <ul style="list-style-type: none"> <li>• Electric current and charge</li> <li>• Circuit components and symbols</li> <li>• Series and parallel circuits</li> <li>• Potential difference and resistance</li> <li>• Energy transfer in electrical appliances</li> <li>• Electricity generation and sustainability</li> </ul>	<p><b>TOPIC TEST – 30 MINS</b></p>	<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• <i>“Electricity and Magnetism”</i> by DK Eyewitness</li> <li>• <i>“The Boy Who Harnessed the Wind”</i> by William Kamkwamba</li> </ul> <p><b>Extra-Curricular Activities:</b></p> <ul style="list-style-type: none"> <li>• Science Museum electricity exhibits and workshops <ul style="list-style-type: none"> <li>• STEM</li> </ul> </li> </ul>
<p><b>Year 8 HT3</b></p>	<p><b>Interactions and Interdependence</b> – In this unit, students explore the relationships between organisms and how they depend on each other and their environments for</p>		<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• <i>“Food Chains and Webs”</i> by Anita Ganeri</li> </ul>

	<p>survival. They study food chains and webs, competition, adaptation, and the impact of environmental changes on ecosystems</p> <ul style="list-style-type: none"> <li>• Food chains and food webs</li> <li>• Competition and adaptation</li> <li>• Predator–prey relationships</li> <li>• Environmental changes</li> <li>• Ecosystem balance and disruption</li> <li>• Biodiversity and sustainability</li> </ul>	<b>TOPIC TEST – 30 MINS</b>	<ul style="list-style-type: none"> <li>• <i>“The Secret Life of Trees”</i> by Colin Tudge</li> </ul> <p><b>Extra-Curricular Activities:</b></p> <ul style="list-style-type: none"> <li>• Natural History Museum ecology exhibits</li> <li>• London Wildlife Trust conservation activities <ul style="list-style-type: none"> <li>• London Zoo</li> <li>• Whipsnade safari park</li> </ul> </li> </ul>
<b>Year 8 HT4</b>	<p><b>Forces and Work</b> – In this unit, students investigate how forces cause changes in motion and how work is done when a force moves an object. They explore concepts such as resultant forces, work done, energy transfer, and the relationship between force, distance, and energy. Students also study simple machines and their practical applications.</p> <ul style="list-style-type: none"> <li>• Forces and motion</li> <li>• Resultant forces</li> <li>• Work done and energy transfer</li> <li>• Force, distance, and energy</li> <li>• Simple machines and levers</li> </ul>		<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• <i>“Forces and Motion”</i> by Christopher Gordon</li> <li>• <i>“The Way Things Work Now”</i> by David Macaulay</li> </ul>
<b>Year 8 HT4</b>	<p><b>Acids and Alkalis</b> – This unit focuses on the properties and reactions of acids and alkalis. Students learn to identify acids, alkalis, and neutral substances using indicators, explore neutralisation reactions, and investigate the pH scale. The unit also covers the uses of acids and alkalis in everyday life and industrial processes.</p> <ul style="list-style-type: none"> <li>• Properties of acids and alkalis</li> <li>• pH scale and indicators</li> <li>• Neutralisation reactions</li> <li>• Everyday and industrial uses</li> <li>• Safety when handling acids and alkalis</li> </ul>		<p><b>Wider Reading:</b></p> <ul style="list-style-type: none"> <li>• <i>“Acids, Bases and Salts”</i> by Roy Watson</li> <li>• <i>“The Chemistry of Everyday Things”</i> by Joe Schwarcz</li> </ul> <p><b>Extra-Curricular Activities:</b></p> <ul style="list-style-type: none"> <li>• Science Museum chemistry demonstrations <ul style="list-style-type: none"> <li>• Chemistry clubs and science fairs</li> <li>• Baking a cake!</li> </ul> </li> </ul>

**PPE 2 consists of 3 papers. Students will be assessed on the following (including Y7 content)**

**Biology:** 8.04 Plants and their Processes, 8.06 Interactions and Interdependence

**Chemistry:** 8.02 Earth and the atmosphere, 8.08 Acids & Alkalis

**Physics:** 8.01 Heating & Cooling, 8.03 Forces in Motion, 8.05 Electricity

Revision resources can be found on Satchel One and Seneca

<b>Year 8</b> <b>HT5</b>	<b>Nutrition and Digestion</b> – In this unit, students study the importance of nutrition and the processes involved in digestion. They learn about the different nutrients required by the body, the structure and function of the digestive system, and how nutrients are absorbed and transported. The unit highlights the importance of a balanced diet for health. <ul style="list-style-type: none"> <li>• Nutrients and their functions</li> <li>• Digestive system structure</li> <li>• Processes of digestion and absorption</li> <li>• Transport of nutrients</li> <li>• Balanced diet and health</li> </ul>		<b>Wider Reading:</b> <ul style="list-style-type: none"> <li>• “Why Do We Eat?” by Christine Berrie</li> <li>• “The Human Body” by DK Eyewitness</li> </ul>
<b>Year 8</b> <b>HT6</b>	<b>Space</b> – This unit introduces students to the Earth’s place in the universe. Topics include the solar system, phases of the moon, day and night, and the movement of planets. Students explore concepts of gravity and orbit, and the role of space exploration in advancing scientific knowledge. <ul style="list-style-type: none"> <li>• Solar system and planets</li> <li>• Phases of the moon</li> <li>• Earth’s rotation and day/night</li> <li>• Gravity and orbits</li> <li>• Space exploration and technology</li> </ul>	<b>TOPIC TEST</b> <b>30 MINS</b>	<b>Wider Reading:</b> <ul style="list-style-type: none"> <li>• “Cosmos” by Carl Sagan</li> <li>• “National Geographic Kids: Space Encyclopedia”</li> </ul> <b>Extra-Curricular Activities:</b> <ul style="list-style-type: none"> <li>• Royal Observatory Greenwich planetarium <ul style="list-style-type: none"> <li>• London Planetarium show</li> <li>• Natural History Museum</li> <li>• Science Museum</li> </ul> </li> </ul>

<b>Term</b>	<b>Curriculum Content</b>	<b>Assessment(s)</b> <i>(assessment title, duration and approx date)</i>	<b>Extra-Curricular Options</b> <i>(Places to visit; wider reading; clubs to join)</i>
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**Year 9 Curriculum Overview:**  
*Students finalize their KS3 journeys by looking at more difficult concepts such as reactivity, energetics, and sound and continue to develop their experimental and investigative skills. Students begin KS4 content during the summer term with the foundational chemistry and biology. Topics taught are: 9PM Matter, 9CR Reactivity, 9CE Energetics and Rates, 9BB Biological Systems and processes, 9PS Sound, B1: Cell Biology, C1: Atomic Structure and the Periodic Table*

**Wider Reading:**  
<https://www.sciencejournalforkids.org/>  
Wow science <https://wowscience.co.uk/>  
<https://www.youtube.com/@bbcteach>  
One Zoo Three Series  
Read articles in The Day or in New Scientist

Year 9 HT1	<p><b>Matter</b> – Students will review the particle model and then explore how particle interactions cause pressure, floating and diffusion.</p> <ul style="list-style-type: none"> <li>• Density</li> <li>• Diffusion and Brownian motion</li> <li>• Pressure in a liquid</li> <li>• Upthrust, floating and sinking</li> </ul> <p>Atmospheric Pressure</p>	9CM TOPIC TEST – 35 MINS	Try out one of these cool at home experiments on density: <a href="https://www.sciencebuddies.org/blog/density-experiments">https://www.sciencebuddies.org/blog/density-experiments</a>
Year 9 HT1	<p><b>Reactivity</b> - We will begin a recap of basic atomic structure and then move onto calculations on atomic mass and formula mass. Then we will explore the reactivity of metals, acids and alkalis.</p> <ol style="list-style-type: none"> <li>1. Atomic Structure</li> <li>2. Reactions and bonding</li> <li>3. Ar, Mr and balancing equations</li> <li>4. Metals and acids</li> <li>5. Metal oxides and acids</li> <li>6. Metal Carbonates and acids</li> <li>7. Acids and Alkalis</li> <li>8. Salt preparation</li> <li>9. Reactivity series</li> <li>10. Extraction of metal</li> <li>11. Displacement reactions</li> </ol>	9CR TOPIC TEST	Check out this cool video of Alkali metal reactions! <a href="https://www.youtube.com/watch?v=eaChisV5uR0">https://www.youtube.com/watch?v=eaChisV5uR0</a>
Year 9 HT3	<p><b>9CE Energetics + Rates</b></p> <p>This topic will introduce the idea of rates and factors that affect rates for the first time. The ideas of surface area and catalysts are introduced.</p> <p>The lessons in this unit are as follows:</p> <ol style="list-style-type: none"> <li>1. Measuring rates and particle theory</li> <li>2. RP: Effect of concentration</li> <li>3. Surface area</li> <li>4. Catalysts</li> <li>5. Endothermic and Exothermic</li> <li>6. Combustion</li> <li>7. Thermal combustion</li> </ol>	9CE TOPIC TEST	Read more about chemical energy in this article: <a href="https://sciencenotes.org/what-is-chemical-energy-definition-and-examples/">https://sciencenotes.org/what-is-chemical-energy-definition-and-examples/</a>

**Assessment week 2 - MID-YEAR PPE – 60 MINS**

**Topics: 9BP Photosynthesis • 9CR Reactivity • 9CE Energetics • 9PM Matter • 9PF Forces in Action**

Knowledge from any year 7 & 8 units may be assessed  
**Chemistry:** Particle Theory, Chemical reactions, Separation techniques , Periodic Table, Materials and the Earth  
**Biology:** Reproduction, Cells, tissues and organs, Ecology, Digestion  
**Physics:** Energy, Forces , Light and Space, Electricity and magnetism  
**Revision resources posted on Satchel One and Seneca**

<p><b>Year 9 HT4</b></p>	<p><b>9BB Biological Systems and Processes</b>  This unit of work begins with a recap of organisational hierarchy, with students recalling the function of different organ systems. Students will then focus on the skeletal and muscular systems, considering how these two interact to produce movement and locomotion.  The lessons in this unit are as follows:</p> <ol style="list-style-type: none"> <li>1. Recap of levels of organisational</li> <li>2. Skeletal system</li> <li>3. Muscles</li> <li>4. Respiratory system</li> <li>5. Breathing and Lung volume</li> <li>6. Aerobic and anaerobic respiration</li> <li>7. The effects of exercise</li> <li>8. Smoking</li> <li>9. The effect of drugs and alcohols</li> <li>10. Discovery of DNA</li> <li>11. Building a DNA model <ul style="list-style-type: none"> <li>• Inheritance</li> </ul> </li> </ol>	<p><b>9BB TOPIC TEST</b></p>	<p>Visit Chessington or London Zoo to improve your knowledge of animals and their environments.  <a href="https://www.zsl.org/zsl-london-zoo">https://www.zsl.org/zsl-london-zoo</a></p> <p>•Visit the Grant Museum of Zoology</p>
<p><b>Year 9 HT5</b></p>	<p><b>Sound</b> -This unit builds on light waves and begins by reviewing waves. Waves in matter are explored and how we observe them.</p> <ul style="list-style-type: none"> <li>• Sound Waves</li> <li>• Speed of sound</li> <li>• Hearing</li> <li>• Ultrasound</li> <li>• Sound devices</li> </ul>	<p><b>9PS TOPIC TEST – 35 MINS</b></p>	<p>Check out a concert at the Southbank Centre or National Theatre!!</p> <p>Check out the Making the Modern World exhibition at the Science Museum</p>

**Assessment Week 4**  
3 exams - Biology, chemistry, physics – each 40 minutes and 40 marks  
Knowledge from any KS3 unit may be assessed

<b>Chemistry:</b> Reactivity , Energetics, Particle Theory, Chemical reactions, Separation techniques , Periodic Table, Materials and the Earth <b>Biology:</b> Photosynthesis, Biological Systems and Processes, Reproduction, Cells, tissues and organs, Ecology, Digestion <b>Physics:</b> Forces in Action, Matter , Sound , Energy, Forces , Light and Space, Electricity and magnetism Revision resources can be found on Google Classroom and Oak Academy website - <a href="https://continuityoak.org.uk/Lessons#">https://continuityoak.org.uk/Lessons#</a>			
Term	Year 10 Curriculum Content	Assessment(s)	Extra-Curricular Options
Year 9 HT6	<p><b>GCSE Periodic Table</b> – Students will study the periodic table which provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties.</p> <ul style="list-style-type: none"> <li>• Elements and Compounds</li> <li>• Mixtures and separation</li> <li>• Separation by distillation and by chromatography</li> <li>• Atomic Structure</li> <li>• Development of the atomic model</li> <li>• Isotopes</li> <li>• Electron configuration</li> <li>• Periodic Table development</li> <li>• Why elements react</li> <li>• Group 1 and 7 elements and displacement</li> </ul>	CHEM 1 TEST – 45 MINS	<p>Read more about all the interesting elements on this interactive periodic table  <a href="https://www.rsc.org/periodic-table/">https://www.rsc.org/periodic-table/</a></p>
Year 9 HT6	<p><b>GCSE Cell Biology</b> -Students will begin their GCSE journey by learning about cells which are the basic unit of all forms of life. Cells are controlled by genes and students will study how cells transfer key chemicals.</p> <ul style="list-style-type: none"> <li>• Different Types of cells</li> <li>• Microscopes</li> <li>• RP : Plant cells and animal cells</li> <li>• Specialised cells</li> <li>• Diffusion</li> <li>• Internal surfaces</li> <li>• Osmosis</li> <li>• Active transport</li> <li>• Genes DNA and Cell cycle</li> <li>• Stem cells</li> </ul>	No assessment	<p>Visit Chessington or London Zoo to improve your knowledge of animals and their environments.  <a href="https://www.zsl.org/zsl-london-zoo">https://www.zsl.org/zsl-london-zoo</a></p> <p>Visit the Grant Museum of Zoology</p>

(assessment title, duration and approx date)

(Places to visit; wider reading; clubs to join)

<p><b>Year 10 Curriculum Overview:</b>          Students will develop scientific knowledge in biology, chemistry, and physics, understand the nature of science, and apply observational, practical, and problem-solving skills. They will build on their skills through the year to critically analyse scientific claims and evaluate methodology, evidence, and conclusions.          Topics include:  <b>Biology topics 2–4:</b> Organisation; Infection and response; and Bioenergetics.  <b>Physics topics 1 - 4:</b> Energy; Electricity; Particle model of matter; and Atomic structure.  <b>Chemistry topics 2-5:</b> Bonding, structure, and the properties of matter; Quantitative chemistry; Chemical changes; and Energy changes.  <b>Triple Science</b> students will cover all of the topics that combined students will cover, they will also cover extra topics that are only found on the Triple Science specification.</p>			<ul style="list-style-type: none"> <li>· CGP revision guide</li> <li>· CGP Student books for biology, chemistry, and physics</li> <li>· Oxford Revise revision guide</li> </ul>
<p><b>HT1</b></p>	<p><b>Energy</b> - Energy is a fundamental principle in physics that allows for the accomplishment of work. It exists in different forms or “stores” and can be transferred, dissipated, or stored in various ways.          Energy transfers          Kinetic, Elastic and Gravitational Potential energy          Work done and Power          Specific Heat Capacity RP          Reducing Unwanted Energy Transfers          Using energy resources          Triple only :          Thermal insulators          Multistep calculations          Gas pressure          Pressure Volume</p>	<p>Topic test- 30 to 50 marks</p>	<p>Visit the science museum and check out their energy hall.          Go the Technicians: The Davud Dainsbury at the science museum to learn about being a wind turbine technician.</p>
<p><b>HT1</b></p>	<p><b>Organisation</b> In this section we will learn about the human digestive system which provides the body with nutrients and</p>	<p>Topic test- 30 to 50 marks</p>	<p>Visit the Natural History Museum in South Kensington, London, on weekends and during the holidays. Check out the latest exhibitions and attractions online at: <a href="http://www.nhm.ac.uk/visit.html">www.nhm.ac.uk/visit.html</a>.</p>

	<p>the respiratory system that provides it with oxygen and removes carbon dioxide.</p> <ol style="list-style-type: none"> <li>1. Food tests</li> <li>2. Digestive enzymes</li> <li>3. Digestion and Absorption</li> <li>4. Required practical on enzymes</li> <li>5. The Lungs</li> <li>6. Blood and blood vessels</li> <li>7. Heart and Heart Disease</li> <li>8. Lifestyle and disease including Cancer</li> <li>9. Plant tissues and organs</li> <li>10. Transpiration and Translocation</li> </ol> <p><b>Triple students will also cover:</b>  The Eye  Using the Eye  Eye Defects  The Brain  Growing Microorganisms and Testing Antibiotics</p>		<p>Check out the Being Human exhibition at the Wellcome trust</p>
<p>HT2</p>	<p><b>Bonding, structure, and the properties of matter</b> - Chemists use theories of structure and bonding to explain the physical and chemical properties of materials. Students will study the theories of bonding to explain how atoms are held together.</p> <ol style="list-style-type: none"> <li>1. Ionic Bonding and their Properties</li> <li>2. Covalent bonding and the various types</li> <li>3. Polymers</li> <li>4. The structure and bonding of Carbon</li> <li>5. Metallic bonding</li> <li>6. Solids, liquids and gases</li> </ol> <p><b>Triple only</b>  1.17 Reaction trends  1.18 Transition metals  2.15 Nanoparticles</p>	<p>Topic test- 30 to 50 marks</p>	<p>Grow your own crystal e.g. salt  <a href="http://www.sciencekids.co.nz/projects/saltcrystals.html">http://www.sciencekids.co.nz/projects/saltcrystals.html</a></p>

<p style="text-align: center;"><b>HT2</b></p>	<p><b>Electricity</b>- Students will study how electric charge is a fundamental property of matter everywhere and how this is used to design components and build electric circuits.</p> <ol style="list-style-type: none"> <li>1. Current and charge</li> <li>2. Ohm's law</li> <li>3. Required practical resistance in a wire</li> <li>4. Resistance in series circuits and parallel circuits</li> <li>6. Required practical IV Characteristics</li> <li>9. Light dependant resistors</li> <li>10. Thermistor</li> <li>11. Electricity in the home</li> <li>12. Appliances: power and energy</li> <li>14. National grid</li> </ol> <p>Triple Only Static electricity Electric fields</p>	<p>Topic test- 30 to 50 marks</p>	<p style="text-align: center;">Visit the science museum and check out their energy hall. Go the Technicians: The Davud Dainsbury at the science museum to learn about being a wind turbine technician.</p>
<p style="text-align: center;"><b>HT2</b></p>	<p><b>Infection and response</b> - They learn how pathogens are microorganisms that cause infectious diseases, explore how we can avoid diseases, and how the body uses barriers against pathogens.</p> <ol style="list-style-type: none"> <li>1. Infectious disease</li> <li>2. Viral bacterial disease</li> <li>3. Fungal protist disease</li> <li>4. Immune response</li> <li>5. Vaccines</li> <li>6. Medication to treat disease</li> <li>7. Drug development</li> </ol> <p>Triple Only Monoclonal antibodies Plant disease and defences</p>	<p>Topic test- 30 to 50 marks</p>	<p>Visit Chessington or London Zoo to improve your knowledge of animals and their environments. <a href="https://www.zsl.org/zsl-london-zoo">https://www.zsl.org/zsl-london-zoo</a> Go the Technicians: The Davud Dainsbury at the science museum to learn about being a lighting technicain.</p>
<p><b>AW2PPE 1</b> 1 paper x 75 mins that assesses the following topics Biology: Cell biology, Organisation Chemistry: Atomic structure and the periodic table, Bonding Physics: Energy, Electricity</p>			

Revision resources can be found on google classroom			
<b>HT3</b>	<p><b>Quantitative Chemistry</b> – Students study how chemists use quantitative analysis to determine the formulae of compounds and the equations for reactions.</p> <ol style="list-style-type: none"> <li>Atomic and formula mass</li> <li>Moles and Avogadro's (Higher)</li> <li>Balancing equations</li> <li>Reacting masses</li> <li>Solutions</li> <li>Limiting reactants (Higher)</li> <li>Moles and gases</li> </ol> <p><b>Triple only</b>            Atom Economy            Percentage Yield            Titrations Introductions            Using volumes of gases</p>	Topic test- 30 to 50 marks	
<b>HT4</b>	<p><b>Particle model of matter</b> – Students will study the particle model to predict the behaviour of solids, liquids, and gases in everyday life.</p> <ol style="list-style-type: none"> <li>Particle model</li> <li>Density solids</li> <li>Density liquids</li> <li>Internal energy</li> <li>Specific latent heat</li> <li>Gas pressure</li> </ol> <p><b>Triple only</b>            Particle motion in gasses            Increasing the pressure of a gas            Pressure in Liquids            Atmospheric pressure</p>	Topic test- 30 to 50 marks	Subscribe to the Whizz Pop Bang magazine; a new monthly children's science magazine. <a href="https://www.whizzpopbang.com">https://www.whizzpopbang.com</a>
<b>HT4 Triple only</b>	<p><b>Space (Triple Only)</b> - Students will explore how the various bodies in our solar system and universe have formed and the main evidence we have for the creation of the universe.            The Solar System</p>	Topic test- 30 to 50 marks	Visit the Exploring Space exhibition and the engineers exhibition at the Science Museum  Visit the Royal Observatory in Greenwich!

	<p>Orbits  Life Cycle of Stars  Element Synthesis  Origins of the Universe  CMBR</p>		
HT4	<p><b>Chemical Changes</b> – Students study common chemical reactions and their applications. Students will use these ideas to predict what substances could form and understand the extraction of important resources from the earth.</p> <ol style="list-style-type: none"> <li>Oxidation and reduction</li> <li>Metals, metal oxides, metal carbonates and acids reactions</li> <li>Displacement reactions</li> <li>Making salts</li> <li>Acid-alkali reaction and</li> <li>Strong and weak acids (Higher)</li> <li>Binary compound electrolysis</li> <li>Electrolysis of solutions and required practical</li> </ol> <p>Triple only  RP: Titration  Fuel Cells  Hydrogen Fuel Cells</p>	<p>Topic test- 30 to 50 marks</p>	<p>Subscribe to the BBC Focus Magazine. <a href="http://www.sciencefocus.com/">http://www.sciencefocus.com/</a></p>
HT4	<p><b>Bioenergetics</b> - In this section we will explore how plants harness the Sun's energy in photosynthesis to make food and oxygen. Both animals and plants use this oxygen to oxidise food in a process called aerobic respiration.</p> <ol style="list-style-type: none"> <li>Photosynthesis</li> <li>Required practical rate of photosynthesis</li> <li>Required practical rate and limiting factor</li> <li>Respiration and exercise</li> <li>Anaerobic respiration</li> <li>Metabolism</li> </ol> <p><b>Triple only</b>  Biomass and Energy Transfer</p>	<p>Topic test- 30 to 50 marks</p>	<p><a href="#">Vist the Medicine: The Wellcome Galleries at the Science Museum</a></p>

	Food security and Farming RP Decay		
<b>HT5</b>	<p><b>Atomic Structure</b> Students will understand how ionising radiation is hazardous but can be very useful and how it is made.</p> <ol style="list-style-type: none"> <li>1. Atoms and isotopes</li> <li>2. Development of atomic model</li> <li>3. Radiation</li> <li>4. Half life</li> <li>5. Using radiation</li> <li>6. Irradiation</li> </ol> <p>Triple only Nuclear fission and fusion</p>	Topic test- 30 to 50 marks	Read: Marie Curie and Her Daughters: The Private Lives of Science's First Family
<b>HT5</b>	<p><b>Energy Changes</b> - Students study the interaction of particles often involves transfers of energy due to the breaking and formation of bonds. These interactions between particles can produce heating or cooling effects that are used in a range of everyday applications.</p> <ol style="list-style-type: none"> <li>1. Exothermic and endothermic</li> <li>2. Required practical energy changes</li> <li>4. energy level diagrams</li> <li>5. Bond energies (higher)</li> </ol> <p>Triple only – Reactions of alkenes alcohols Combustion of alcohols</p>	Topic test- 30 to 50 marks	See the effects of this at the London Transport Museum
<b>HT5/6</b>	<p><b>Ecology</b> – Students learn to understand the interconnectedness of ecosystems and the services they provide. Discuss the significance of sustainable practices and actions we can take to protect biodiversity for our well-being and future generations.</p> <ol style="list-style-type: none"> <li>1. Communities</li> <li>2. Biotic and Abiotic factors</li> <li>3. Adaptations</li> </ol>	Topic test- 30 to 50 marks	Visit Chessington or London Zoo to improve your knowledge of animals and their environments. <a href="https://www.zsl.org/zsl-london-zoo">https://www.zsl.org/zsl-london-zoo</a>

	4. Estimating populations RP 5. Nutrient cycles 6. Global warming 7. Biodiversity		
<b>AW4 PPE 2</b> 3 papers x 75 mins Triple 3 papers x 105 minutes Biology 1 – Cell biology, Organisation, Infection and Response, Bioenergetics Chemistry 1 – Atomic structure and periodic table, Bonding, Quantitative Chemistry, Chemical changes Physics 1 – Energy, Electricity, Particle model of matter, Atomic Structure Revision resources can be found on Google Classroom			
<b>Year 10</b>	<b>Rates</b> – Students learn methods to measure the rate of chemical reaction and investigate how different factors affect these rates. <ol style="list-style-type: none"> <li>Measuring rates and Required practical</li> <li>The effect of temperature</li> <li>The effect of surface area</li> <li>Pressure in gaseous reactions</li> <li>The effects of catalysts</li> <li>Reversible reactions</li> <li>Le Chateliers Principle (HIGHER only)</li> <li>Industrial conditions (HIGHER only)</li> </ol> <b>Triple only:</b> Carboxylic acids Synthetic Polymers Natural Polymers	Topic test- 30 to 50 marks	
<b>Term</b>	<b>SCIENCE Curriculum Content</b>	<b>Assessment(s)</b> <i>(assessment title, duration and approx date)</i>	<b>Extra-Curricular Options</b> <i>(Places to visit; wider reading; clubs to join)</i>
<b>Year 11 Curriculum Overview:</b> Biology, chemistry, and physics are studied to develop curiosity about the natural world, insight into how science works, and appreciation of its relevance to their everyday lives. Students will continue the paper 2 content they started in the summer of year 10 and complete all paper 2 content prior to the second mocks. <b>November mocks will cover all year 9 and 10 content</b>			

- Biology paper 1: Cell Biology; Organisation; Infection and response; and Bioenergetics.
- Chemistry paper 1: Atomic structure and the periodic table; Bonding, structure, and the properties of matter; Quantitative chemistry; Chemical changes; and Energy changes.
- Physics paper 1: Energy; Electricity; Particle model of matter; and Atomic structure.

**February mocks will cover all paper 2 content**

- Biology Paper 2: Homeostasis and response; Inheritance, variation and evolution; and Ecology.
- Chemistry Paper 2: The rate and extent of chemical change; Organic chemistry; Chemical analysis; Chemistry of the atmosphere; and Using resources.
- Physics Paper 2: Forces; Waves; and Magnetism and electromagnetism

HT1	<p><b>Chemical Analysis</b> Understand how to detect and analyse chemicals using qualitative tests and instrumental techniques.</p> <ul style="list-style-type: none"> <li>• Pure substances and formulations</li> <li>• RP - Chromatography</li> <li>• Gas Tests</li> </ul> <p>Triple only RP – Testing for positive ions RP - Testing for negative ions Identifying unknowns Flame emission spectroscopy</p>	Topic test 30 to 50 marks	<p>Watch this video on forensic science! <a href="https://youtu.be/h3-Pj-zbEq8?feature=shared">https://youtu.be/h3-Pj-zbEq8?feature=shared</a></p> <p>An Intro to Forensics: The Science of Crime</p>
HT1	<p><b>Earths early atmosphere</b> Understand how our atmosphere has changed over time and how humans are impacting it now.</p> <ul style="list-style-type: none"> <li>• Greenhouse gases</li> <li>• atmospheric pollutants</li> <li>• Climate change</li> <li>• carbon footprint</li> </ul>	Topic test 30 to 50 marks	Visit the Exploring Space exhibition at the Science Museum
HT1	<p><b>Use of Earth's resources</b> Understand how industries collect and use resources and their environmental impact</p> <ul style="list-style-type: none"> <li>• LCA and recycling</li> <li>• Alternative metal extraction (HIGHER)</li> <li>• RP - Potable Water</li> <li>• Waste water treatment</li> </ul> <p>Triple only:</p>	Topic test 30 to 50 marks	<p>Engineers' exhibition at the Science Museum</p> <p>Visit the Brunel Museum</p>

	<p>Corrosion prevention Alloys Ceramics, polymers and composites Haber process NPK fertilisers NPK fertilisers 2</p>		
HT2	<p><b>Forces</b> Understand and describe how forces interact with different objects and cause different motions</p> <ul style="list-style-type: none"> <li>• Forces and interactions</li> <li>• <math>W=mg</math></li> <li>• Resultant forces</li> <li>• Forces and work</li> <li>• Forces and elasticity</li> <li>• RP - Hooke's Law</li> <li>• Speed, distance, time</li> <li>• Acceleration</li> <li>• Velocity and acceleration</li> <li>• Terminal Velocity</li> <li>• RP - Acceleration</li> <li>• Forces and Braking</li> <li>• Momentum (HIGHER ONLY)</li> </ul> <p>Triple only Moments and Levers Moments and Gears Car safety</p>	<p>PPE 1 - Biology Paper 1, Chemistry Paper 1 and Physics Paper 1 - Each 75 minutes, 75 marks</p> <p>Topic test 30 to 50 marks</p>	<p>Check out the Making the Modern World exhibition at the Science Museum</p>
<p><b>AW2 PPE 1</b> 3 papers x 75 mins Triple 3 papers x 105 minutes Biology 1 – Cell biology, Organisation, Infection and Response, Bioenergetics Chemistry 1 – Atomic structure and periodic table, Bonding, Quantitative Chemistry, Chemical changes Physics 1 – Energy, Electricity, Particle model of matter, Atomic Structure Revision resources can be found on Google Classroom</p>			
HT2	<p><b>Homeostasis and response</b> – Students develop and understanding of how humans react to stimuli in the endocrine and nervous systems.</p> <ul style="list-style-type: none"> <li>• Nervous System</li> </ul>	<p>Topic test 30 to 50 marks</p>	<p><a href="#">Vist the Medicine: The Wellcome Galleries at the Science Museum</a></p>

	<ul style="list-style-type: none"> <li>• Reflex Actions</li> <li>• Reaction Times</li> <li>• Hormonal Responses</li> <li>• Homeostasis</li> <li>• Blood Glucose Control</li> <li>• Diabetes and Treatment</li> <li>• Reproductive Hormones</li> <li>• Fertility Treatment (HIGHER ONLY)</li> <li>• Contraception</li> </ul>		
<b>HT2</b>	<p><b>Inheritance, variation and evolution</b> Understand how genes are inherited over time and combine to produce different characteristics</p> <ul style="list-style-type: none"> <li>• Variation and Natural selection</li> <li>• Evolution and Extinction</li> <li>• Evidence for Evolution (I)</li> <li>• Selective breeding</li> <li>• Genetic engineering</li> <li>• Classification</li> </ul> <p><b>Triple only</b> Sexual and Asexual reproduction Protein synthesis Mendel Darwin and Wallace Speciation Cloning</p>	Topic test 30 to 50 marks	Visit the Jurassic Coast whilst holidaying in Dorset and East Devon. Visit the museums, visitor centres and attractions, take the 'walk through time' and hunt for fossils. <a href="http://jurassiccoast.org">http://jurassiccoast.org</a> .
<b>HT3</b>	<p><b>Organic Chemistry</b> Understand the chemistry of carbon compounds that are found in living and once-living materials, like plants and animals, including fossil fuels.</p> <ul style="list-style-type: none"> <li>• Crude oil and alkanes</li> <li>• Fractional distillation</li> <li>• Cracking</li> <li>• Using crude oil products</li> </ul>	Topic test 30 to 50 marks	Check out how plastic which is a product of hydrocarbons can be used at the Design Museum!
<b>HT3</b>	<p><b>Waves</b> Understand how waves carry energy and information and how different types of waves can be used for different technologies</p> <ul style="list-style-type: none"> <li>• Waves</li> <li>• Wave calculation</li> </ul>	Topic test 30 to 50 marks	Go the Technicians exhibition at the science museum to learn about being a lighting technician.

	<ul style="list-style-type: none"> <li>• Sound in air</li> <li>• RP - Wave speed in liquids + solids</li> <li>• Waves at boundaries (COMBINED ONLY)</li> <li>• Properties and uses of EM waves</li> <li>• RP - Infrared radiation</li> </ul> <p>Triple only  RP - Reflection  RP – Refraction  Sound waves  Using waves to detect and explore  Dangers of EM radiation  Lenses  Visible light  Black body radiation</p>		
<b>HT3</b>	<p><b>Magnetism and electromagnetism Understand</b> electromagnetic effects used in a wide variety of devices from including motors.</p> <ul style="list-style-type: none"> <li>• Magnetism + magnetic fields</li> <li>• Electromagnetism</li> <li>• Motor effect</li> <li>• Motors</li> </ul> <p>Triple only  EM Induction and Generators  Electromagnetic Devices  Transformers  Transformers Equations</p>	Topic test 30 to 50 marks	<p><b>Visit the London transport Museum</b></p> <p><b>Visit the Energy Hall in the Science Museum</b></p>
<p><b>PPE 2 - Biology Paper 2, Chemistry Paper 2 and Physics Paper 2 - Each 75 minutes, 75 marks</b></p> <ul style="list-style-type: none"> <li>• Biology Paper 2: Homeostasis and response; Inheritance, variation and evolution; and Ecology.</li> <li>• Chemistry Paper 2: The rate and extent of chemical change; Organic chemistry; Chemical analysis; Chemistry of the atmosphere; and Using resources.</li> <li>• Physics Paper 2: Forces; Waves; and Magnetism and electromagnetism</li> </ul>			
<p><b>Year 11 HT5</b>  <b>Revision and Exam prep</b></p>			

Term	PHYSICS Curriculum Content	Assessment(s) (assessment title, duration and approx date)	Extra-Curricular Options (Places to visit; wider reading; clubs to join)
<p><b>Year 12 Physics Curriculum Overview:</b>  <i>In Y12, students study the core topics of physics of particles and radiation, waves and optics, mechanics and martials, and electricity. These topics build on the KS4 curriculum studied in Y10 and Y11, refining knowledge and skills as students study the topics with greater depth and breadth. Students also develop their working scientifically skills through 6 core practicals over the course of the year.</i></p>			
<p><b>Year 12 HT1</b></p>	<p><b>Particles</b>            Particles introduces students both to the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena. We begin with this topic to provide a new interest and knowledge dimension beyond GCSE. Through a study of these topics, students become aware of the way ideas develop and evolve in physics. They will appreciate the importance of international collaboration in the development of new experiments and theories in this area of fundamental research.            Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Constituents of the atom</li> <li>• Stable and unstable nuclei</li> <li>• Particles, antiparticles and photons</li> <li>• Particle interactions and classification of particles</li> <li>• Quarks and antiquarks</li> <li>• Applications of conservation laws</li> </ul> <p><b>Mechanics - Moments</b>            Vectors and their treatment are introduced followed by development of the student's knowledge and understanding of forces, energy and momentum.            Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Scalars and vectors</li> <li>• Moments</li> </ul>	<p><b>Ch.1 Particles assessment</b></p> <p><b>Ch.2 Quarks and leptons assessment</b></p> <p><b>Ch. 6 Forces in equilibrium assessment</b></p>	<p><b>Richard Feynman's 6 easy pieces of physics</b></p> <p><b>Join the institute of physics (IoP)</b></p>
<p><b>Year 12 HT2</b></p>	<p><b>Quantum Physics</b>            Building on particle physics, to electromagnetic radiation and quantum phenomena. This culminates in the study of wave-particle duality to have a full understanding of the particle and wave like nature of physics.</p>	<p><b>Ch.3 Quantum Physics assessment</b></p> <p><b>Ch.7 on the move assessment</b></p>	

	<p>Students will learn about</p> <ul style="list-style-type: none"> <li>• The photoelectric effect</li> <li>• Collisions of electrons with atoms</li> <li>• Energy levels and photon emission</li> <li>• Wave-particle duality</li> </ul> <p><b>Mechanics - Projectile motion</b>          Vectors and their treatment are introduced followed by development of the student's knowledge and understanding of forces, energy and momentum.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Motion along a straight line</li> <li>• Projectile motion</li> </ul>	<p><b>Ch.8 Newtons law's of motion assessment</b></p> <p><b>PPE 1</b></p>	
<p><b>Year 12 HT3</b></p>	<p><b>Waves and optics</b>          GCSE studies of wave phenomena are extended through a development of knowledge of the characteristics, properties, and applications of travelling waves and stationary waves. Topics treated include refraction, diffraction, superposition and interference.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Progressive waves</li> <li>• Longitudinal and transverse waves</li> <li>• Principle of superposition of waves and formation of stationary waves</li> <li>• Interference</li> <li>• Diffraction</li> <li>• Refraction at a plane surface</li> </ul> <p><b>Mechanics - Newtons Laws of Motion and Energy</b>          Vectors and their treatment are introduced followed by development of the student's knowledge and understanding of forces, energy and momentum.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Newton's laws of motion</li> </ul>	<p><b>PPE 1</b></p> <p><b>Ch.4 Waves assessment</b></p> <p><b>Ch.9 Forces and momentum assessment</b></p> <p><b>Ch.10 Work, energy and power assessment</b></p>	

	<ul style="list-style-type: none"> <li>• Momentum</li> <li>• Work, energy and power</li> <li>• Conservation of energy</li> </ul>		
<p><b>Year 12 HT4</b></p>	<p><b>Electricity:</b> Electricity builds on and develops earlier study of these phenomena from GCSE. It provides opportunities for the development of practical skills at an early stage in the course and lays the groundwork for later study of the many electrical applications that are important to society.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Basics of electricity</li> <li>• Current–voltage characteristics</li> <li>• Resistivity</li> <li>• Circuits</li> <li>• Potential divider</li> <li>• Electromotive force and internal resistance</li> </ul> <p><b>Materials</b> The study of mechanics at Y12 culminates with the study of materials considered in terms of their bulk properties and tensile strength.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Bulk properties of solids</li> <li>• The Young modulus</li> </ul>	<p><b>Ch.5 Optics assessment</b></p> <p><b>Ch.12 Electric current assessment</b></p> <p><b>Ch.11 Materials assessment</b></p> <p><b>PPE 2</b></p>	<p><b>Visit Oxford University's School of Material Science.</b></p>
<p><b>Year 12 HT5</b></p>	<p><b>Further Mechanics:</b> The earlier study of mechanics is further advanced through a consideration of circular motion and simple harmonic motion (the harmonic oscillator).</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Circular motion</li> <li>• Simple harmonic motion (SHM)</li> <li>• Simple harmonic systems</li> </ul>	<p><b>Ch.13 DC circuits assessment</b></p> <p><b>Ch.17 Motion in a circle assessment</b></p> <p><b>Ch.17 Motion in a circle assessment</b></p>	

	<ul style="list-style-type: none"> <li>Forced vibrations and resonance</li> </ul>		
<b>Year 12 HT6</b>	<p><b>Revision</b> Students will revise for their end of year exams covering everything they have learnt in Y12.</p> <p><b>Thermal Physics</b> Building on Y12 mechanics, further mechanics allows the thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory to be studied in depth. Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>Thermal energy transfer</li> </ul>	<p><b>PPE 2 – end of year exams</b></p> <p><b>Ch.19 - Thermal Physics assessment</b></p>	
<b>Term</b>	<b>PHYSICS Curriculum Content</b>	<b>Assessment(s)</b> <i>(assessment title, duration and approx date)</i>	<b>Extra-Curricular Options</b> <i>(Places to visit; wider reading; clubs to join)</i>
<p><b>Year 13 Physics Curriculum Overview:</b> <i>In Y13 Physics students build on their Y12 physics knowledge, practical skills and mathematic skills to develop a complete understanding and fluency of physics. At the end of the course, students are ready to continue their studies in physics or science related degree.</i></p>			
<b>Year 13 HT1</b>	<p><b>Thermal Physics</b> Building on Y12 mechanics, further mechanics allows the thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory to be studied in depth. Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>Thermal energy transfer</li> <li>Ideal gases</li> <li>Molecular kinetic theory model</li> </ul> <p><b>Fields and their consequences – Gravitational fields.</b> The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasise this unification. Many ideas from mechanics and electricity from earlier in the course support</p>	<p><b>Ch.19 - Thermal Physics assessment</b></p> <p><b>Ch.21 - Gravitation fields assessment</b></p>	

	<p>this and are further developed. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Fields</li> <li>• Gravitational fields</li> <li>• Gravitational field strength</li> <li>• Gravitational potential</li> <li>• Orbits of planets and satellites</li> </ul>		
<p><b>Year 13 HT2</b></p>	<p><b>Thermal Physics</b> Building on Y12 mechanics, further mechanics allows the thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory to be studied in depth.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Thermal energy transfer</li> <li>• Ideal gases</li> <li>• Molecular kinetic theory model</li> </ul> <p><b>Fields and their consequences – Electric fields</b> The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasise this unification. Many ideas from mechanics and electricity from earlier in the course support this and are further developed. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Coulomb's law</li> <li>• Electric field strength</li> <li>• Electric potential</li> </ul>	<p><b>Ch.20 - Gasses assessment</b></p> <p><b>Ch.22 - Electric fields</b></p>	
<p><b>Year 13 HT3</b></p>	<p><b>Nuclear Physics – Radioactivity</b> This section builds on the work of Particles and radiation to link the properties of the nucleus to the production of nuclear power through the characteristics of the nucleus,</p>	<p><b>Ch.26 - Radioactivity assessment</b></p> <p><b>Ch.23 - Capacitors assessment</b></p>	

	<p>the properties of unstable nuclei, and the link between energy and mass. Students should become aware of the physics that underpins nuclear energy production and also of the impact that it can have on society</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Rutherford scattering</li> <li>• <math>\alpha</math>, <math>\beta</math> and <math>\gamma</math> radiation</li> <li>• Radioactive decay</li> </ul> <p><b>Fields and their consequences – Capacitance</b></p> <p>The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasise this unification. Many ideas from mechanics and electricity from earlier in the course support this and are further developed. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Capacitance</li> <li>• Parallel plate capacitor</li> <li>• Energy stored by a capacitor</li> <li>• Capacitor charge and discharge</li> </ul>		
<p><b>Year 13 HT4</b></p>	<p><b>Nuclear Physics – Nuclear energy</b></p> <p>This section builds on the work of Particles and radiation to link the properties of the nucleus to the production of nuclear power through the characteristics of the nucleus, the properties of unstable nuclei, and the link between energy and mass. Students should become aware of the physics that underpins nuclear energy production and also of the impact that it can have on society</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Nuclear instability</li> <li>• Nuclear radius</li> <li>• Mass and energy</li> <li>• Induced fission and safety issues</li> </ul>	<p><b>Ch.27 - Nuclear energy assessment</b></p> <p><b>Ch.24 - Magnetic fields assessment</b></p> <p><b>Ch.25 - Electromagnetic induction assessment</b></p>	

	<p><b>Fields and their consequences – Magnetic Fields and Electromagnetic Induction</b></p> <p>The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasise this unification. Many ideas from mechanics and electricity from earlier in the course support this and are further developed. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Magnetic flux density</li> <li>• Moving charges in a magnetic field</li> <li>• Magnetic flux and flux linkage</li> <li>• Electromagnetic induction</li> <li>• Alternating currents</li> <li>• The operation of a transformer</li> </ul>		
<p><b>Year 13 HT5</b></p>	<p><b>Turning points in physics:</b></p> <p>Turning points in physics is intended to enable key concepts and developments in physics to be studied in greater depth than in the core content. Students will be able to appreciate, from historical and conceptual viewpoints, the significance of major paradigm shifts for the subject in the perspectives of experimentation and understanding. Many present-day technological industries are the consequence of these key developments and the topics in the option illustrate how unforeseen technologies can develop from new discoveries.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• The discovery of the electron</li> <li>• Wave-particle duality</li> <li>• Special relativity</li> </ul>	<p><b>Turning points in physics assessment.</b></p>	

Term	CHEMISTRY Curriculum Content	Assessment(s) (assessment title, duration and approx date)	Extra-Curricular Options (Places to visit; wider reading; clubs to join)
	<p><b>Year 12 Chemistry Curriculum Overview:</b>  <i>A-Level Chemistry covers a wide variety of basic concepts such as the structure of the atom; the interaction of matter and energy and how to control reactions; patterns in the periodic table and understanding carbon-based molecules. Students will build upon skills and knowledge learned at GCSE Chemistry. Many topics include mathematics calculations, and students will also be expected to carry out experiments regularly to consolidate class work and to build upon their skills and confidence in completing safe and accurate practical work. In Year 12, students study Year 1 of the 2-year A-Level Chemistry specification. The course is split into two, taught by 2 teachers simultaneously.</i></p> <p><i>The topics we teach in Year 12 are:</i></p> <ul style="list-style-type: none"> <li>- <i>Physical Chemistry – Atomic structure, Amount of substance, Bonding and structure, Redox, Energetics, Kinetics, Equilibria</i></li> <li>- <i>Inorganic Chemistry – Periodicity, Group 2, Group 7</i></li> <li>- <i>Organic Chemistry – Alkanes, Alkenes, Haloalkanes, Alcohols, Organic analysis</i></li> </ul>		<p><b>Royal Society of Chemistry</b></p> <p><b>Chemistry Olympiads</b></p> <p><b>Playerfm/Chemistry podcasts</b></p> <p><b>Oxford Chemistry reading list</b></p>
<p><b>Year 12 HT1</b></p>	<p><b>Atomic structure</b>  Atomic Structure introduces students to the fundamental ideas of chemistry, which are further built upon throughout the specification. Students will appreciate that knowledge and understanding of atomic structure has evolved over time. They will be able to determine the number of fundamental particles in atoms, ions using the periodic table and explain the existence of isotopes in addition to interpreting simple mass spectra of elements and calculating relative atomic mass from isotopic abundance. They should also be able to explain how first ionisation energies give evidence for electron configuration in sub shells.</p> <ul style="list-style-type: none"> <li>• Fundamental Particles</li> <li>• Mass number and isotopes</li> <li>• Electron Configuration</li> </ul> <p><b>Amount of Substance</b>  Amount of Substance introduces students to the maths skills that will be heavily required throughout the course. It builds upon basic maths skills learned at GCSE, and</p>	<p><b>Atomic Structure Test</b></p> <p><b>Amount of Substance Test</b></p> <p><b>Bonding Test</b></p> <p><b>Kinetics Test</b></p>	

gives students a deeper understanding of why these calculations are so important for chemists. In this unit students are also introduced to the first required practical, in which they will be assessed on their experimental and analytical skills.

- Relative atomic mass + Relative molecular mass
- The mole and Avogadro's constant
- The Ideal Gas Equation
- Empirical and molecular formula
- Balanced equations and associated calculations
- RP: Making up a volumetric solution

### **Bonding**

Students build upon bonding knowledge and understand the physical and chemical properties of compounds depend on the ways in which the compounds are held together. They also are introduced to theories of bonding and how to deduce the shape of molecules, this unit of study again builds upon students basic knowledge obtained at GCSE level and is crucial to progressing throughout the 2 years of study.

- Ionic Bonding
- Covalent Bonding
- Metallic Bonding
- Shapes of simple molecules and ions
- Bond Polarity
- Forces between molecules

### **Kinetics**

The study of kinetics enables chemists to determine how a change in conditions affects the speed of a chemical reaction. They also understand and appreciate whilst the reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are variables that can be manipulated to speed them up or slow them down. Students are also taught how to draw and interpret distribution curves for different temperatures, and are also introduced to another CPAC.

- Collision Theory
- Maxwell-Boltzmann distribution
- Effect of temperature on reaction rate
- Effect of concentration and pressure
- Catalysts

	<ul style="list-style-type: none"> <li>RP: Investigation of how rate changes with temperature</li> </ul>		
Year 12 HT2	<p><b>Energetics</b> Students will learn how to define the different types of enthalpy changes and understand reactions can be endothermic or exothermic. They will understand how the enthalpy change in a chemical reaction can be measured accurately and appreciate the importance of this value for chemical reactions, as well as be exposed to the applications of these reactions in everyday life.</p> <ul style="list-style-type: none"> <li>Enthalpy Changes</li> <li>Calorimetry</li> <li>Applications of Hess' Law</li> <li>Bond enthalpies</li> <li>RP: Measurement of an enthalpy change</li> </ul> <p><b>Chemical equilibria, Le Chatelier's principle, and Kc</b> In contrast with kinetics, a study of equilibria indicates how far reactions will go. Students learn how Le Chatelier's principle can be used to predict the effects of changes in temperature, pressure, and concentration on the yield of a reversible reaction; which has important consequences for many industrial processes. The further study of the equilibrium constant <math>K_c</math>, considered how the mathematical expression for the equilibrium constant enables us to calculate how an equilibrium yield will be influenced by the concentration of the reactants and products</p> <ul style="list-style-type: none"> <li>Chemical equilibria and Le Chatelier's principle</li> <li>Equilibrium constant <math>K_c</math> for homogeneous systems</li> </ul> <p><b>Introduction to Organic Chemistry</b> Students are introduced to Organic Chemistry, and will appreciate that there are various structurally diverse compounds in living systems and how organic compounds demonstrate human ingenuity in the vast range of synthetic materials created by chemists. Students will also be taught how organic compounds are named using the IUPAC system and understand how mechanisms are used to explain reactions.</p> <ul style="list-style-type: none"> <li>Nomenclature</li> <li>Reaction mechanisms</li> <li>Isomerism</li> </ul> <p><b>Alkanes</b></p>	<p><b>Energetics Test</b></p> <p><b>Equilibria Test</b></p> <p><b>Intro to Organic Test</b></p> <p><b>Alkanes Test</b></p>	

	<p>Students will learn how alkanes are the main constituent of crude oil, and the importance of this raw material for the chemical industries. They will also understand the uses of them and the environmental consequences of them are considered in this unit.</p> <ul style="list-style-type: none"> <li>• Fractional distillation of crude oil</li> <li>• Modifications of alkanes by cracking</li> <li>• Combustion of alkanes</li> <li>• Chlorination of alkanes</li> </ul>		
<p><b>Year 12 HT3</b></p>	<p><b>Periodicity</b> Students will learn about how the periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties. In addition to appreciating the historical development of the periodic table and models of atomic structure providing good examples of how scientific ideas and explanations develop over time.</p> <ul style="list-style-type: none"> <li>• Classification</li> <li>• Physical properties of Period 3 elements</li> </ul> <p><b>Oxidation, Reduction and Redox Equations</b> Student will be able to work out the oxidation state of a element in a formula or ion and write half equations identifying oxidation, reduction and redox processes; in addition to learning how to combine half equations to give an overall redox equation</p> <p><b>Halogenoalkanes</b> Students will learn how to outline the mechanisms involved for these compounds. They will learn how halogenoalkanes are much more reactive than alkanes and their many uses as solvents and in pharmaceuticals.</p> <ul style="list-style-type: none"> <li>• Nucleophilic Substitution</li> <li>• Elimination</li> <li>• Ozone depletion</li> </ul> <p><b>Alkenes</b> This section covers how the high electron density of the carbon-carbon double bond leads to attach on these molecules by electrophiles. It also covers the mechanism of addition to the double bond and introduces addition polymers, which are commercially important and have many uses in society</p> <ul style="list-style-type: none"> <li>• Structure, bonding and reactivity</li> </ul>	<p><b>PPE 1 (Paper 1)</b></p> <p><b>PPE 1 (Paper 2)</b></p> <p><b>Periodicity and Redox Test</b></p> <p><b>Halogenoalkanes Test</b></p> <p><b>Alkenes Test</b></p>	

	<ul style="list-style-type: none"> <li>• Addition reactions of alkenes</li> <li>• Addition polymers</li> </ul>		
Year 12 HT4	<p><b>Group 2, the alkaline earth metals</b> Students will learn about the elements in group 2, the trends in the solubilities of the hydroxides and sulphates of these elements and how they are linked to their use. They will understand the applications of these in medicine and agriculture.</p> <p><b>Group 7, the halogens</b> Students will learn about the halogens in Group 7. Trends in their physical and chemical properties are examined and explained. And the ability of the halogens to behave as oxidising agents and the halides to behave as reducing agents</p> <ul style="list-style-type: none"> <li>• Trends in properties</li> <li>• Uses of chlorine and chlorate (I)</li> <li>• RP: Carry out simple test-tube reactions to identify ions</li> </ul> <p><b>Alcohols</b> Students will learn how alcohols have many scientific, medicinal, and industrial uses. Students should also be able to outline the mechanisms for the formation of alcohols from alkenes and from fermentation. They will also be taught chemical tests used to distinguish between products of oxidation of alcohols.</p> <ul style="list-style-type: none"> <li>• Alcohol production</li> <li>• Oxidation of alcohols</li> <li>• Elimination</li> <li>• RP: Distillation of a product from a reaction</li> </ul> <p><b>Organic Analysis</b> Students will learn our understanding of organic molecules, their structure, and the way they react, has been enhanced by organic analysis. This unit considers some of the analytical techniques used by chemists, including the test-tube reactions and spectroscopic techniques</p> <ul style="list-style-type: none"> <li>• Identification of functional groups by test-tube reactions</li> <li>• Mass spectrometry</li> <li>• Infrared spectroscopy</li> <li>• RP: Tests for alcohol, aldehyde, alkene, and carboxylic acids</li> </ul>	<p><b>Group 2 + Group 7 Test</b></p> <p><b>Alcohols Test</b></p> <p><b>Organic Analysis Test</b></p>	
Year 12 HT5	Revision	Mock PPE	

	Students will revise for their end of year exams covering everything they have learnt in Y12. This time will also be used to address misconceptions, re-teach topics and catch-up for students to be ready for their End of Year exams/AS exams; and to be ready to begin Year 2 content after these exams.		
<b>Year 12 HT6</b>	<p><b>Thermodynamics (A level)</b> Students will begin Year 2 content by studying thermodynamics which is the further study of energetics and builds upon knowledge and concepts learnt in that unit. It is important in understanding the stability of compounds and why chemical reactions occur. Students will understand how enthalpy change is linked to entropy change enabling the free-energy change to be calculated.</p> <ul style="list-style-type: none"> <li>• Born Haber cycles</li> <li>• Gibbs free energy change and entropy change</li> </ul> <p><b>Optical Isomerism (A level)</b> Students will learn that compounds that contain an asymmetric carbon atom form stereoisomers that differ in their effect on plane polarised light.</p>	<p><b>End of Year PPE 2 (Paper 1)</b> <b>End of Year PPE 2 (Paper 2)</b></p>	
<b>Term</b>	<b>CHEMISTRY Curriculum Content</b>	<b>Assessment(s)</b> <i>(assessment title, duration and approx date)</i>	<b>Extra-Curricular Options</b> <i>(Places to visit; wider reading; clubs to join)</i>
<p><b>Year 13 Chemistry Curriculum Overview:</b> <i>In Y13 Chemistry students build on their Y12 chemistry knowledge, practical skills and mathematic skills to develop a complete understanding and fluency of chemistry. At the end of the course, students are ready to continue their studies in chemistry or science related degree.</i> <i>The topics we teach in Year 13 are:</i></p> <ul style="list-style-type: none"> <li>- <i>Physical Chemistry – Thermodynamics, Acids and Bases, Electrode potentials, Rate equations, Equilibrium constant K<sub>p</sub></i></li> <li>- <i>Inorganic Chemistry – Period 3 Oxides, Transition Metals, Reactions of Aqueous ions in solution</i></li> <li>- <i>Organic Chemistry – Optical Isomerism, Aldehydes, Ketones, Carboxylic Acids, Esters, Amines, Aromatics, Organic Analysis</i></li> </ul>			<p><b>Royal Society of Chemistry</b></p> <p><b>Chemistry Olympiads</b></p> <p><b>Playerfm/Chemistry podcasts</b></p> <p><b>Oxford Chemistry reading list</b></p>
<b>Year 13 HT1</b>	<p><b>Acids and Bases</b> Students will learn how acids and bases are important in domestic, environmental, and industrial contexts. They will understand how acidity in aqueous solutions is caused by hydrogen ions and a logarithmic scale, pH, as been devised to measure acidity. They will appreciate how buffer solutions can be made from partially neutralised weak acids, resist changes in pH and find many important industrial and biological applications.</p> <ul style="list-style-type: none"> <li>• Bronsted-Lowry acid-base equilibria in aqueous solution</li> <li>• Definition and determination of pH</li> </ul>	<p><b>Acids and Bases Test</b></p> <p><b>Equilibrium constant Test</b></p> <p><b>Organic Test</b></p>	

	<ul style="list-style-type: none"> <li>• The ionic product of water, <math>K_w</math></li> <li>• Weak acids and bases, <math>K_a</math> for weak acids</li> <li>• pH curves, titrations and indicators</li> <li>• Buffer action</li> <li>• RP: Investigate how pH changes when a weak acid reacts with a strong base</li> <li>• RP: Investigate how pH changes when a strong acid reacts with a weak base</li> </ul> <p><b>Equilibrium constant, <math>K_p</math> for homogeneous systems</b> Students will further study equilibria and consider how the mathematical expression for the equilibrium constant <math>K_p</math> enables us to calculate how an equilibrium yield will be influenced by the partial pressures of reactants and products and the consequences of this on reactions in industry.</p> <p><b>Aldehydes and Ketones</b> Students learn how to construct mechanisms to show the addition reactions of aldehydes and ketones.</p> <p><b>Carboxylic acids and esters</b> Students learn how carboxylic acids are weak acids, and the reactions of them with alcohols in the presence of an acid catalyst give an ester. Students also learn how to identify esters and the uses of products of reactions of carboxylic acids in industry, food and fuels.</p>		
<p><b>Year 13 HT2</b></p>	<p><b>Electrode Potentials and Electrochemical cells</b> Students will learn redox reactions take place in electrochemical cells where electrons are transferred from the reducing agent to the oxidising agent indirectly via an external circuit. A potential difference is created that can drive an electric current to do work. Students will appreciate the applications of electrochemical cells commercially as a portable supply of electricity to power electronic devices, and on a larger scale to power vehicles</p> <ul style="list-style-type: none"> <li>• Electrode potentials and cells</li> <li>• Commercial applications of electrochemical cells</li> <li>• RP: Measuring the EMF of an electrochemical cell</li> </ul> <p><b>Properties of Period 3 elements and their oxides</b> The reactions of Period 3 elements with oxygen are considered. Students will learn the trends of melting points of the oxides in terms of structure and bonding, in addition to the reactions of these oxides with water and the types of products they produce.</p> <p><b>Acylation</b></p>	<p><b>PPE 1 (Paper 1)</b> <b>PPE 1 (Paper 2)</b> <b>PPE 1 (Paper 3)</b></p> <p><b>Electrode potentials Assessment</b></p> <p><b>Period 3 Oxides Assessment</b></p> <p><b>Acylation and Aromatics Assessment</b></p>	

	<p>Students learn the structures of acid anhydrides, acyl chlorides and amides. As well as the industrial advantages of ethanoic anhydride over ethanoyl chloride in the manufacture of the drug aspirin</p> <ul style="list-style-type: none"> <li>- RP: Preparation of a pure organic solid and test its purity</li> <li>- RP: Preparation of a pure organic liquid</li> </ul> <p><b>Aromatic Chemistry</b> Aromatic Chemistry takes benzene as an example of this type of molecule and students look at the structure of the benzene ring and its substitution reactions. Students should be able to use thermochemical evidence from enthalpies of hydrogenation to account for this extra stability and explain why substitution reactions occur in preference to addition reactions</p> <p><b>Rate equations</b> In rate equations, the mathematical relationship between rate of reaction and concentration gives information about the mechanism of a reaction that may occur in several steps.</p> <ul style="list-style-type: none"> <li>• Rate equations</li> <li>• Determination of rate equation</li> <li>• RP: Measuring the rate of reaction by initial rate method</li> <li>• RP: Measuring the rate of reaction by continuous monitoring method</li> </ul>	<p><b>Rate equations Assessment</b></p>	
<p><b>Year 13 HT3</b></p>	<p><b>Transition metals</b> Students will learn how the 3d block consists of the most useful metals in industry and everyday life. The characteristics of these elements will be studied in much detail and students will be to explain the importance of these properties linked to their usefulness. In addition to understanding and drawing the shape of complex ions and building upon knowledge of stereoisomerism.</p> <ul style="list-style-type: none"> <li>• General properties of transition metals</li> <li>• Substitution reactions</li> <li>• Shapes of complex ions</li> <li>• Formation of coloured ions</li> <li>• Variable oxidation states</li> <li>• Catalysts</li> </ul> <p><b>Electrophilic Substitution</b></p>	<p><b>Transition metals Assessment</b></p> <p><b>Organic Assessment</b></p>	

	<p>Students should be able to outline the electrophilic mechanisms of nitration and acylation reactions. Students will appreciate how nitration is an important step in synthesis.</p> <p><b>Amines</b> Students learn how amines are compounds based on ammonia where hydrogen atoms have been replaced by alkyl or aryl groups. This unit also includes their reactions as nucleophiles</p> <ul style="list-style-type: none"> <li>• Preparation</li> <li>• Base properties</li> <li>• Nucleophilic properties</li> </ul> <p><b>Polymers</b> Students learn the study of polymers is extended to include condensation polymers. The formation of condensation polymers is studied, together with their properties, uses and problems associated with the reuse or disposal of them</p> <ul style="list-style-type: none"> <li>• Condensation Polymers</li> <li>• Biodegradability and disposal of polymers</li> </ul> <p><b>Amino Acids</b> Students learn how amino acids, proteins and DNA are molecules of life. In this unit the structure and bonding in these molecules and the way they interact is studied. This unit has cross-curricular links with A Level Biology.</p> <ul style="list-style-type: none"> <li>• Amino acids</li> <li>• Proteins</li> <li>• Enzymes</li> <li>• DNA</li> <li>• Action of anti-cancer drugs</li> </ul>		
<p><b>Year 13</b> <b>HT4</b></p>	<p><b>Reactions of ions in aqueous solution</b> Students will build upon knowledge obtained in transition metals and now look deeply at the reactions of transition metals in aqueous solution. They will understand how these ions can be identified by test-tube reactions in the laboratory. They will also be able to explain the acidity of the ions produced</p> <ul style="list-style-type: none"> <li>• RP: Carry out simple test-tube reactions to identify transition metal ions in aqueous solution</li> </ul> <p><b>Organic Synthesis</b></p>	<p><b>PPE 2 (Paper 1)</b> <b>PPE 2 (Paper 2)</b> <b>PPE 2 (Paper 3)</b></p> <p><b>Reactions of aqueous solution</b> <b>Assessment</b></p>	

	<p>Students will be able to explain why chemists aim to design processes that do not require a solvent and that use non-hazardous materials; in addition to explain why they aim to design a production with fewer methods and steps to ensure a high percentage atom economy. And to use reactions in this specification to devise a synthesis map for organic compounds; linking everything they have learned in organic chemistry.</p> <p><b>Nuclear magnetic resonance spectroscopy</b> Students will have an appreciation that scientists have developed a range of analytical techniques which together enable the structures of new compounds. In addition to understanding how to use NMR spectra to determine the structure and how chemical shifts depend on the molecular environment and use proton and carbon NMR respectively.</p> <p><b>Chromatography</b> Students will learn how chromatography provides an important method of separating and identifying components in a mixture. Different types of chromatography are used depending on the composition of mixture to be separated</p> <ul style="list-style-type: none"> <li>• RP: Separation of species by thin-layer chromatography</li> </ul>	<p><b>Organic Synthesis Assessment</b></p> <p><b>NMR Assessment</b></p>	
<p><b>Year 13</b> <b>HT5</b></p>	<p><b>Revision</b> Students will use this term to revise and prepare for their A-Level exams</p>	<p><b>A-Level Chemistry Paper 1</b> <b>(2 hours)</b></p> <p><b>A-Level Chemistry Paper 2</b> <b>(2 hours)</b></p> <p><b>A-Level Chemistry Paper 3</b> <b>(90 mins)</b></p>	

<b>Term</b>	<b>BIOLOGY Curriculum Content</b>	<b>Assessment(s)</b> <i>(assessment title, duration and approx date)</i>	<b>Extra-Curricular Options</b> <i>(Places to visit; wider reading; clubs to join)</i>
	<p><b>Year 12 Biology Curriculum Overview:</b> <i>In Y12, students study the core topics of biological molecules, cells, organisms exchange substances with their environment, and genetic information, variation and relationships between organisms. These topics build on the KS4 curriculum studied in Y10 and Y11, refining knowledge and skills as students study the topics with greater depth and breadth. Students also develop their working scientifically skills through core practicals over the course of the year.</i></p>		
<p><b>Year 12</b> <b>HT1</b></p>	<p><b>Biological molecules</b></p>		

Despite their great variety, the cells of all living organisms contain only a few groups of carbonbased compounds that interact in similar ways. Carbohydrates are commonly used by cells as respiratory substrates. They also form structural components in plasma membranes and cell walls. Lipids have many uses, including the bilayer of plasma membranes, certain hormones and as respiratory substrates. Proteins form many cell structures. They are also important as enzymes, chemical messengers and components of the blood. Nucleic acids carry the genetic code for the production of proteins. The genetic code is common to viruses and to all living organisms, providing evidence for evolution. The most common component of cells is water; hence our search for life elsewhere in the universe involves a search for liquid water.

Students will learn about/ develop skills of:

- Carbohydrates- monosaccharides, disaccharides and polysaccharides
- Lipids
- Proteins
- Enzyme action
- Factors affecting enzyme action
- Enzyme inhibition

### **Cells**

All life on Earth exists as cells. These have basic features in common. Differences between cells are due to the addition of extra features. This provides indirect evidence for evolution. All cells arise from other cells, by binary fission in prokaryotic cells and by mitosis and meiosis in eukaryotic cells. All cells have a cell-surface membrane and, in addition, eukaryotic cells have internal membranes. The basic structure of these membranes is the same and enables control of the passage of substances across exchange surfaces by passive or active transport. Cell-surface membranes contain embedded proteins. Some of these are involved in cell signalling – communication between cells. Others act as antigens, allowing recognition of ‘self’ and ‘foreign’ cells by the immune system. Interactions between different types of cell are involved in disease, recovery from disease and prevention of symptoms occurring at a later date if exposed to the same antigen, or antigen-bearing pathogen.

	<p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• The structure of eukaryotic cells</li> <li>• The structure of prokaryotic cells and of viruses</li> <li>• Methods of studying cells</li> <li>• The stages of mitosis</li> <li>• Transport across cell membranes- diffusion, facilitated diffusion, osmosis, active transport, and co-transport</li> <li>• Cell recognition and the immune system</li> </ul>		
<p><b>Year 12 HT2</b></p>	<p><b>Organisms exchange substances with their environment</b></p> <p>The internal environment of a cell or organism is different from its external environment. The exchange of substances between the internal and external environments takes place at exchange surfaces. To truly enter or leave an organism, most substances must cross cell plasma membranes. In large multicellular organisms, the immediate environment of cells is some form of tissue fluid. Most cells are too far away from exchange surfaces, and from each other, for simple diffusion alone to maintain the composition of tissue fluid within a suitable metabolic range. In large organisms, exchange surfaces are associated with mass transport systems that carry substances between the exchange surfaces and the rest of the body and between parts of the body. Mass transport maintains the final diffusion gradients that bring substances to and from the cell membranes of individual cells. It also helps to maintain the relatively stable environment that is tissue fluid.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Exchange between organisms and their environment</li> <li>• Gas exchange in single-celled organisms and insects</li> <li>• Gas exchange in fish</li> <li>• Gas exchange in the leaf of a plant</li> <li>• Limiting water loss</li> <li>• Structure of the human gas-exchange system</li> <li>• Mechanism of breathing</li> <li>• Exchange of gases in the lungs</li> </ul> <p><b>Digestion and absorption</b></p>		

	<p>During digestion, large biological molecules are hydrolysed to smaller molecules that can be absorbed across cell membranes. Digestion in mammals of: • carbohydrates by amylases and membrane-bound disaccharidases • lipids by lipase, including the action of bile salts • proteins by endopeptidases, exopeptidases and membranebound dipeptidases. Mechanisms for the absorption of the products of digestion by cells lining the ileum of mammals, to include: • co-transport mechanisms for the absorption of amino acids and of monosaccharides • the role of micelles in the absorption of lipids.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Enzymes and digestion</li> <li>• Absorption of the products of digestion</li> </ul>		
<p><b>Year 12 HT3</b></p>	<p><b>Mass transport in animals</b></p> <p>The haemoglobins are a group of chemically similar molecules found in many different organisms. Haemoglobin is a protein with a quaternary structure. The role of haemoglobin and red blood cells in the transport of oxygen. The loading, transport and unloading of oxygen in relation to the oxyhaemoglobin dissociation curve. The cooperative nature of oxygen binding to show that the change in shape of haemoglobin caused by binding of the first oxygens makes the binding of further oxygens easier. The effects of carbon dioxide concentration on the dissociation of oxyhaemoglobin (the Bohr effect). Many animals are adapted to their environment by possessing different types of haemoglobin with different oxygen transport properties. The general pattern of blood circulation in a mammal. Names are required only of the coronary arteries and of the blood vessels entering and leaving the heart, lungs and kidneys. The gross structure of the human heart. Pressure and volume changes and associated valve movements during the cardiac cycle that maintain a unidirectional flow of blood. The structure of arteries, arterioles and veins in relation to their function. The structure of capillaries and the importance of capillary beds as exchange surfaces. The formation of tissue fluid and its return to the circulatory system.</p> <p>Students will learn about/ develop skills of:</p>		

	<ul style="list-style-type: none"> <li>• analyse and interpret data relating to pressure and volume changes during the cardiac cycle</li> <li>• • analyse and interpret data associated with specific risk factors and the incidence of cardiovascular disease</li> <li>• • evaluate conflicting evidence associated with risk factors affecting cardiovascular disease</li> <li>• • recognise correlations and causal relationships.</li> </ul> <p><b>Mass transport in plants</b></p> <p>Xylem as the tissue that transports water in the stem and leaves of plants. The cohesion-tension theory of water transport in the xylem. Phloem as the tissue that transports organic substances in plants. The mass flow hypothesis for the mechanism of translocation in plants. The use of tracers and ringing experiments to investigate transport in plants.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• recognise correlations and causal relationships</li> <li>• interpret evidence from tracer and ringing experiments and to evaluate the evidence for and against the mass flow hypothesis.</li> </ul>		
<p><b>Year 12 HT4</b></p>	<p><b>DNA, genes and chromosomes</b></p> <p>In prokaryotic cells, DNA molecules are short, circular and not associated with proteins. In the nucleus of eukaryotic cells, DNA molecules are very long, linear and associated with proteins, called histones. Together a DNA molecule and its associated proteins form a chromosome. The mitochondria and chloroplasts of eukaryotic cells also contain DNA which, like the DNA of prokaryotes, is short, circular and not associated with protein. A gene is a base sequence of DNA that codes for: • the amino acid sequence of a polypeptide • a functional RNA (including ribosomal RNA and tRNAs). A gene occupies a fixed position, called a locus, on a particular DNA molecule. A sequence of three DNA bases, called a triplet, codes for a specific amino acid. The genetic code is universal, non-overlapping and degenerate. In eukaryotes, much of the nuclear DNA does not</p>		

code for polypeptides. There are, for example, non-coding multiple repeats of base sequences between genes. Even within a gene only some sequences, called exons, code for amino acid sequences. Within the gene, these exons are separated by one or more non-coding sequences, called introns.

Students will learn about/ develop skills of:

- Genes and the triplet code
- DNA and chromosomes
- The structure of RNA
- Protein synthesis- transcription and splicing
- Protein synthesis- translation

**Genetic diversity**

Gene mutations involve a change in the base sequence of chromosomes. They can arise spontaneously during DNA replication and include base deletion and base substitution. Due to the degenerate nature of the genetic code, not all base substitutions cause a change in the sequence of encoded amino acids. Mutagenic agents can increase the rate of gene mutation. Mutations in the number of chromosomes can arise spontaneously by chromosome non-disjunction during meiosis. Meiosis produces daughter cells that are genetically different from each other. The process of meiosis only in sufficient detail to show how: • two nuclear divisions result usually in the formation of four haploid daughter cells from a single diploid parent cell • genetically different daughter cells result from the independent segregation of homologous chromosomes • crossing over between homologous chromosomes results in further genetic variation among daughter cells.

Students will learn about/ develop skills of:

- Mutations
- Meiosis and genetic variation
- Genetic diversity and adaptation
- Types of selection

<p><b>Year 12 HT5</b></p>	<p><b>Genetic diversity and adaptation</b> Genetic diversity as the number of different alleles of genes in a population. Genetic diversity is a factor enabling natural selection to occur</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Use unfamiliar information to explain how selection produces changes within a population of a species</li> <li>• Interpret data relating to the effect of selection in producing change within populations</li> <li>• Show understanding that adaptation and selection are major factors in evolution and contribute to the diversity of living organisms.</li> </ul> <p><b>Species and taxonomy</b> Two organisms belong to the same species if they are able to produce fertile offspring. Courtship behaviour as a necessary precursor to successful mating. The role of courtship in species recognition. A phylogenetic classification system attempts to arrange species into groups based on their evolutionary origins and relationships. It uses a hierarchy in which smaller groups are placed within larger groups, with no overlap between groups. Each group is called a taxon (plural taxa). One hierarchy comprises the taxa: domain, kingdom, phylum, class, order, family, genus and species. Each species is universally identified by a binomial consisting of the name of its genus and species, eg, Homo sapiens. Recall of different taxonomic systems, such as the three domain or five kingdom systems, will not be required.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Advances in immunology and genome sequencing that help to clarify evolutionary relationships between organisms.</li> </ul> <p><b>Biodiversity within a community and investigating diversity</b> Biodiversity can relate to a range of habitats, from a small local habitat to the Earth.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Calculating an index of diversity</li> <li>• Recognise the balance between conservation and farming</li> </ul>		
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	<ul style="list-style-type: none"> <li>• Interpret data relating to similarities and differences in the base sequences of DNA and in the amino acid sequences of proteins to suggest relationships between different organisms within a species and between species</li> <li>• Appreciate that gene technology has caused a change in the methods of investigating genetic diversity; inferring DNA differences from measurable or observable characteristics has been replaced by direct investigation of DNA sequences</li> </ul> <p><b>Revision</b> Students will revise for their end of year exams covering everything they have learnt in Y12. This time will also be used to address misconceptions, re-teach topics and catch-up for students to be ready for their End of Year exams/AS exams; and to be ready to begin Year 2 content after these exams.</p>		
<p><b>Year 12 HT6</b></p>	<p><b>Energy transfer in and between organisms- photosynthesis (A-Level)</b> In communities, the biological molecules produced by photosynthesis are consumed by other organisms, including animals, bacteria and fungi. Some of these are used as respiratory substrates by these consumers. Photosynthesis and respiration are not 100% efficient. The transfer of biomass and its stored chemical energy in a community from one organism to a consumer is also not 100% efficient.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• The light-dependent reaction</li> <li>• The light-independent reaction</li> <li>• Identify factors that limit the rate of photosynthesis</li> </ul> <p><b>Respiration</b> Respiration produces ATP.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Glycolysis</li> <li>• Link reaction and Krebs cycle</li> <li>• Oxidative phosphorylation</li> <li>• Anaerobic respiration</li> </ul>	<p><b>End of Year PPE 2 (Paper 1)</b> <b>End of Year PPE 2 (Paper 2)</b></p>	

	<ul style="list-style-type: none"> <li>• <b>Energy and ecosystems</b> In any ecosystem, plants synthesise organic compounds from atmospheric, or aquatic, carbon dioxide. Most of the sugars synthesised by plants are used by the plant as respiratory substrates. The rest are used to make other groups of biological molecules. These biological molecules form the biomass of the plants.</li> </ul> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Food chains and energy transfer</li> <li>• Energy transfer and productivity</li> <li>• Nutrient cycles</li> <li>• Use of natural and artificial fertilisers</li> <li>• Environmental issues concerning use of nitrogen-containing fertilisers</li> </ul>		
Term	BIOLOGY Curriculum Content	Assessment(s) <i>(assessment title, duration and approx date)</i>	Extra-Curricular Options <i>(Places to visit; wider reading; clubs to join)</i>
<p><b>Year 13 Biology Curriculum Overview:</b> <i>In Y13 Biology students build on their Y12 biology knowledge, practical skills and mathematic skills to develop a complete understanding and fluency of biology. At the end of the course, students are ready to continue their studies in biology or science related degree.</i></p>			
Year 13 HT1	<p><b>Organisms respond to changes in their environment- Response to stimuli</b> A stimulus is a change in the internal or external environment. A receptor detects a stimulus. A coordinator formulates a suitable response to a stimulus. An effector produces a response. Receptors are specific to one type of stimulus. Nerve cells pass electrical impulses along their length. A nerve impulse is specific to a target cell only because it releases a chemical messenger directly onto it, producing a response that is usually rapid, short-lived and localised. In contrast, mammalian hormones stimulate their target cells via the blood system. They are specific to the tertiary structure of receptors on their target cells and produce responses that are usually slow, long-lasting and widespread. Plants control their response using hormone-like growth substances</p>		

	<p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Survival and response</li> <li>• Plant growth factors</li> <li>• A reflex arc</li> <li>• Receptors</li> <li>• Control of heart rate</li> <li>• Nervous coordination and muscles</li> </ul> <p><b>Homeostasis</b></p> <p>Homeostasis in mammals involves physiological control systems that maintain the internal environment within restricted limits. The importance of maintaining a stable core temperature and stable blood pH in relation to enzyme activity. The importance of maintaining a stable blood glucose concentration in terms of availability of respiratory substrate and of the water potential of blood. Negative feedback restores systems to their original level. The possession of separate mechanisms involving negative feedback controls departures in different directions from the original state, giving a greater degree of control.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Principles of homeostasis</li> <li>• Feedback mechanisms</li> <li>• Hormones and the regulation of blood glucose concentration</li> <li>• Diabetes and its control</li> <li>• Control of blood water potential</li> <li>• Role of nephron in osmoregulation</li> <li>• Role of hormones in osmoregulation</li> </ul>		
<p><b>Year 13 HT2</b></p>	<p><b>Genetics, populations, evolution and ecosystems- Inherited change</b></p> <p>The theory of evolution underpins modern Biology. All new species arise from an existing species. This results in different species sharing a common ancestry, as represented in phylogenetic classification. Common ancestry can explain the similarities between all living organisms, such as common chemistry (eg all proteins made from the same 20 or so amino acids), physiological pathways (eg anaerobic respiration), cell structure, DNA as the genetic material and a 'universal' genetic code.</p>		

Students will learn about/ develop skills of:

- Inheritance
- Probability and genetic crosses
- Codominance and multiple alleles
- Sex-linkage
- Autosomal linkage
- Epistasis
- The chi-squared test

**Populations and evolution**

Individuals within a population of a species may show a wide range of variation in phenotype. This is due to genetic and environmental factors. The primary source of genetic variation is mutation. Meiosis and the random fertilisation of gametes during sexual reproduction produce further genetic variation.

Students will learn about/ develop skills of:

- Population genetics
- Variation in phenotype
- Natural selection
- Effects of different forms of selection on evolution
- Isolation and speciation

**Populations in ecosystems**

Populations of different species form a community. A community and the non-living components of its environment together form an ecosystem. Ecosystems can range in size from the very small to the very large.

Students will learn about/ develop skills of:

- Populations in ecosystems
- Variation in population size
- Competition
- Predation
- Investigating populations

	<ul style="list-style-type: none"> <li>• Succession</li> <li>• Conservation of habitats</li> </ul>		
<b>Year 13 HT3</b>	<p><b>The control of gene expression</b></p> <p>Cells are able to control their metabolic activities by regulating the transcription and translation of their genome. Although the cells within an organism carry the same coded genetic information, they translate only part of it. In multicellular organisms, this control of translation enables cells to have specialised functions, forming tissues and organs. There are many factors that control the expression of genes and, thus, the phenotype of organisms. Some are external, environmental factors, others are internal factors. The expression of genes is not as simple as once thought, with epigenetic regulation of transcription being increasingly recognised as important. Humans are learning how to control the expression of genes by altering the epigenome, and how to alter genomes and proteomes of organisms. This has many medical and technological applications. Consideration of cellular control mechanisms underpins the content of this section. Students who have studied it should develop an understanding of the ways in which organisms and cells control their activities. This should lead to an appreciation of common ailments resulting from a breakdown of these control mechanisms and the use of DNA technology in the diagnosis and treatment of human diseases.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Gene mutations</li> <li>• Stem cells and totipotency</li> <li>• Regulation of transcription and translation</li> <li>• Epigenetic control of gene expression</li> <li>• Gene expression and cancer</li> <li>• Genome projects</li> </ul>		
<b>Year 13 HT4</b>	<p><b>Recombinant DNA technology</b></p> <p>Recombinant DNA technology involves the transfer of fragments of DNA from one organism, or species, to another. Since the genetic code is universal, as are transcription</p>		

	<p>and translation mechanisms, the transferred DNA can be translated within cells of the recipient (transgenic) organism.</p> <p>Students will learn about/ develop skills of:</p> <ul style="list-style-type: none"> <li>• Producing DNA fragments</li> <li>• Gene cloning- the use of vectors and the polymerase chain reaction</li> <li>• Locating genes, genetic screening, and counselling</li> <li>• Genetic fingerprinting</li> </ul>		
<p><b>Year 13</b> <b>HT5</b></p>	<p><b>Revision</b> Students will use this term to revise and prepare for their A-Level exams</p>	<p><b>A-Level Biology Paper 1</b> <b>(2 hours)</b> <b>A-Level Biology Paper 2</b> <b>(2 hours)</b> <b>A-Level Biology Paper 3</b> <b>(2 hours)</b></p>	