



Hazel Wood
High School

Part of the

Oak



Learning Partnership

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Science
Curriculum Overview
**Hazel Wood
High School**



Our Curriculum Content:

The study of Science at Hazelwood will provide students with the foundations of understanding the world around them through the teaching of Biology, Chemistry and Physics. The course will enable students to question real life reactions in the home and around them and to question why these things happen and understand the in-depth Science that causes these phenomena. Students will be encouraged to question, predict and explain both familiar and unfamiliar contexts through the course to allow in-depth knowledge and understanding of Science; this will stimulate the student's natural curiosity teaching them core methods of enquiry and investigation skills to find out the answer on their own. Our aim is to instil the love of learning through a practical hand on experience which allows students to become inquisitive young scientist who aspire to further develop their Science knowledge as they leave us.

Qualification Title			
Year 7	Term 1	Term 2	Term 3
Unit Title	Big Idea 1: Forces, Big Idea 3: Energy, Big Idea 5: Matter, Big Idea 6: Reactions	Big Idea 9: Ecosystems, Big Idea 8: Organisms, Big Idea 2: Electricity	Big Idea 7: Earth, Big Idea 10: Genes, Big Idea 4: Waves
Key knowledge and understanding that enables skill building.	<p>Lesson Objectives in our Medium Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • How forces cause changes and movement to objects with real world examples. • What energy stores are and examples of these. • The particle model of solids, liquids and gases and how this affects properties. • What a chemical reaction is. • How to apply scientific knowledge to new contexts. • How to use scientific analysis to compare the amount of energy in different foods. • How to conduct chemical reactions safely using knowledge of hazard symbols. • How to represent chemical reactions in word and symbol equations 	<p>Lesson Objectives in our Medium Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • How organisms interact within a food web. • How organisms are organized. • How to build a simple electrical circuit. • How to apply scientific knowledge to these contexts. • How to carry out safe practical work, using new equipment, including the preparation and use of microscopes to observe cells. • How to carry out scientific analysis to compare and contrast cells and organisms. • How to use electrical equipment to produce a simple circuit. 	<p>Lesson Objectives in our Medium Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • What materials the Earth is made of. • How organisms reproduce. • How to build a simple electrical circuit. • What different objects make up our solar system and universe. • How waves create our hearing and vision. • How to apply scientific knowledge to these contexts. • How to produce different types of sounds.



Vocabulary	<p>All lessons, throughout the course, introduce key terminology at the start, to ensure that students know key words and subject specific terminology. In addition to this, the key terminology for the course is recalled and retrieved through fortnightly homework and there is a full subject glossary at the back of every student's book.</p> <p>In this subject, students also utilise a personal glossary where they are provided with tier 3 vocabulary and students record words that are new to them. Periodically, these glossaries are used by the teacher to test whether students have learnt and know new words.</p>
Assessment	<p>Throughout this unit, and throughout the year, students will be formatively assessed on their knowledge and practical skills to ensure that teaching is bespoke to each of their development needs. They are given personalised feedback following homework, and assessed practicals, that help them to move on with success.</p> <p>Students are expected to complete weekly Homework assessments, that test their increasing knowledge base in relation to the Big Idea they are studying. These are in the form of paper-based retrieval questions. Where questions are consistently incorrect with many pupils responding incorrectly, these are addressed in the 'Homework review' tasks in subsequent lessons.</p> <p>In lessons, there are regular 'low-stakes' quizzes to ensure that students' knowledge base is developing and to help them to retrieve, and commit to memory, key learning points.</p> <p>Baseline assessments are completed to assess prior learning and identify areas for further exploration.</p> <p>Mid-point assessments are completed with a focus on writing like a scientist or applying their knowledge in a variety of tasks/activities.</p> <p>An end of half term assessment is completed following the completion of Big Ideas to provide summative assessment of learning and provide students with bespoke feedback to provide next steps for progress. All Mid-point and End-point assessments are assessed using the 'Assess to progress' (ATOP) targets. Students will use feedback to make improvements to their work.</p>

Year 8	Term 1	Term 2	Term 3
Unit Title	Big Idea 4: Waves, Big Idea 3: Energy, Big Idea 7.3: Climate Change, Big Idea 10.3: Genes, Big Idea 5.3: Matter	Big Idea 6: Reactions, Big Idea 7.4: Earth, Big Idea 9: Ecosystems, Big Idea 8.3: Organisms	Big Idea 8.4: Organisms, Big Idea 10.4: Genes, Big Idea 5.4: Matter, Big Idea 1: Forces, Big Idea 2: Electromagnets
Key knowledge and understanding that enables skill building.	<p>Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • What waves exist that we cannot see and what they are used for, and how human activity is impacting the Earth via global warming. • How heat energy can be transferred. • How elements are arranged on the periodic table. 	<p>Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • How organisms release energy via respiration and why different reactions create temperature changes. • How we obtain useful metals from the rocks in the Earth. • What organs are involved in breathing and how we get oxygen into our blood. 	<p>Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • What constitutes a balanced diet and how our bodies digest food. • How our DNA affects our characteristics. • What pressure is and how it is created by liquids and gases. • How different types of magnets work. • How to apply scientific knowledge to these contexts.



	<ul style="list-style-type: none"> • How to apply scientific knowledge to these contexts. • How to carry out safe practical work using new equipment including the separation of a variety of different mixtures. 	<ul style="list-style-type: none"> • How to apply scientific knowledge to these contexts. • How to conduct chemical reactions safely using knowledge of hazard symbols. • How to represent chemical reactions in word and symbol equations. 	<ul style="list-style-type: none"> • How to carry out safe practical work using new equipment including the building and operation of electrical circuits safely. • How to use probability to predict the inherited characteristics of offspring.
Vocabulary	<p>All lessons, throughout the course, introduce key terminology at the start, to ensure that students know key words and subject specific terminology. In addition to this, the key terminology for the course is recalled and retrieved through fortnightly homework and there is a full subject glossary at the back of every student's book.</p> <p>In this subject, students also utilise a personal glossary where they are provided with tier 3 vocabulary and students record words that are new to them. Periodically, these glossaries are used by the teacher to test whether students have learnt and know new words.</p>		
Assessment	<p>Throughout this unit, and throughout the year, students will be formatively assessed on their knowledge and practical skills to ensure that teaching is bespoke to each of their development needs. They are given personalised feedback following homework, and assessed practicals, that help them to move on with success.</p> <p>Students are expected to complete weekly Homework assessments, that test their increasing knowledge base in relation to the Big Idea they are studying. These are in the form of paper-based retrieval questions. Where questions are consistently incorrect with many pupils responding incorrectly, these are addressed in the 'Homework review' tasks in subsequent lessons.</p> <p>In lessons, there are regular 'low-stakes' quizzes to ensure that students' knowledge base is developing and to help them to retrieve, and commit to memory, key learning points.</p> <p>Baseline assessments are completed to assess prior learning and identify areas for further exploration.</p> <p>Mid-point assessments are completed with a focus on writing like a scientist or applying their knowledge in a variety of tasks/activities.</p> <p>An end of half term assessment is completed following the completion of Big Ideas to provide summative assessment of learning and provide students with bespoke feedback to provide next steps for progress. All Mid-point and End-point assessments are assessed using the 'Assess to progress' (ATOP) targets. Students will use feedback to make improvements to their work.</p>		

Year 9	Term 1	Term 2	Term 3
Unit Title	Big Idea 1: Forces, Big Idea 3: Energy, Big Idea 4: Waves, Big Idea 2: Electricity, Big Idea 5: Matter, Big Idea 6: Reactions	Big Idea 7: Earth, Big Idea 8: Organisms, Big Idea 9: Ecosystems, Big Idea 10: Genes	Biology: B1: Cell structure and transport, B5: Communicable diseases, B6: Preventing and treating diseases, B7: Non-Communicable diseases.
Key Knowledge and Understanding that, where	Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:	Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:	Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:



<p>necessary, enables skill building.</p>	<ul style="list-style-type: none">• How to calculate resultant force and energy efficiency using the correct units and converting values into the appropriate magnitude.• How changing the wavelength of different waves affects their properties and uses.• What electrical circuits are including how to measure current and how heat energy can be transferred.• What the periodic table is and how it is arranged including examples of chemical reactions.• How to apply scientific knowledge to these contexts.• How to carry out safe practical work using new equipment including the building and operation electrical circuits safely.• How to represent chemical reactions in word and symbol equations.• How to conduct chemical reactions safely using knowledge of hazard symbols	<ul style="list-style-type: none">• What useful materials can be obtained from the Earth and the method used for extraction.• The importance of the processes of respiration.• How changes to DNA can lead to the evolution of species• How to make links between human activities and the reduction in biodiversity on the planet.• How to apply scientific knowledge to these contexts.• How to accurately use microscopes.• How to predict the impact of changes in populations of food webs.• How to use probability to predict the inherited characteristics of offspring.	<ul style="list-style-type: none">• The structure and function of plant and animal cells.• The transport of material in and out of a cell and give examples of where this takes place in the animal and plant cells. Students should be able to describe the prevention and treatment of diseases and the process used in drug development.• How to develop Scientific thinking, in which students are able to understand scientific methods and processes; and how these develop over time.• How to use experimental skills, so that students can ask questions based on observations, make predictions using key vocabulary and knowledge learnt throughout the unit of study.• How to carry out investigations through a series of required practical's and make and record measurements and evaluate methods.• How to use analytical skills and strategies in which our students competently apply mathematical concepts and calculate results, present and interpret data using tables and graphs, draw conclusions and evaluate data.• How to use numeracy skills in which students calculate results and manipulate data using scientific formulae, SI units and chemical nomenclature where possible.
<p>Vocabulary</p>	<p>All lessons, throughout the course, introduce key terminology at the start, to ensure that students know key words and subject specific terminology. In addition to this, the key terminology for the course is recalled and retrieved through fortnightly homework and there is a full subject glossary at the back of every student's book.</p> <p>In this subject, students also utilise a personal glossary where they are provided with tier 3 vocabulary and students record words that are new to them. Periodically, these glossaries are used by the teacher to test whether students have learnt and know new words.</p>		



Assessment	<p>Throughout this unit, and throughout the year, students will be formatively assessed on their knowledge and practical skills to ensure that teaching is bespoke to each of their development needs. They are given personalised feedback following homework, and assessed practicals, that help them to move on with success.</p> <p>Students are expected to complete weekly Homework assessments, that test their increasing knowledge base in relation to the Big Idea they are studying. These are in the form of paper-based retrieval questions. Where questions are consistently incorrect with many pupils responding incorrectly, these are addressed in the 'Homework review' tasks in subsequent lessons.</p> <p>In lessons, there are regular 'low-stakes' quizzes to ensure that students' knowledge base is developing and to help them to retrieve, and commit to memory, key learning points.</p> <p>Baseline assessments are completed to assessed prior learning and identify areas for further exploration.</p> <p>Mid-point assessments are completed with a focus on writing like a scientist or applying their knowledge in a variety of tasks/activities.</p> <p>An end of half term assessment is completed following the completion of Big Ideas to provide summative assessment of learning and provide students with bespoke feedback to provide next steps for progress. All Mid-point and End-point assessments are assessed using the 'Assess to progress' (ATOP) targets. Students will use feedback to make improvements to their work.</p>
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Year 10	Term 1	Term 2	Term 3
Unit Title	<p>Biology: B1: Cell structure and transport, B3: Organisation and the digestive system, B5: Communicable diseases, B6: Preventing and treating diseases, B7: Non-Communicable diseases.</p> <p>Physics: P8: Forces in balance, P9: Motion, P10: Force and motion.</p>	<p>Biology: B4: Organising animals and plants, B8: Respiration, P9: Photosynthesis.</p> <p>Chemistry: C5: Chemical Changes, C7: Energy changes, C8: Rates and equilibrium, C10: Chemical analysis.</p> <p>Physics: P2: Energy transfer by heating, P6: Molecules and Matter.</p>	<p>Biology: B15: Adaptations, interdependence, and competition, B16: Organising an ecosystem, B17: Biodiversity and ecosystems.</p>
Key Knowledge and Understanding that, where necessary, enables skill building.	<p>Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> The structure and function of plant and animal cells. The transport of material in and out of a cell and give examples of where this takes place in the animal and plant cells. Students should be able to describe the prevention and 	<p>Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> The detailed structure of the heart and the respiratory system and how systems work together to maintain life. The difference between aerobic and anaerobic respiration. 	<p>Lesson Objectives in our Medium-Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> The ecosystem different organisms live in and the relationships between different communities in the ecosystem. What deforestation is and suggest solutions to prevent this and reduce the amount of carbon dioxide in the atmosphere.



	<p>treatment of diseases and the process used in drug development.</p> <ul style="list-style-type: none">• The role of the digestive system and how enzymes catalyse these reactions.• Determine the behaviour of objects and application of Newtons first law of motion as well as Newtons second law of motion.• Analyse graphs representing motion using velocity-time graphs.	<ul style="list-style-type: none">• The importance of photosynthesis and how plants are adapted to maximise the rate.• How the modern periodic table was developed from early observations and predictions.• Exothermic and endothermic reactions with examples.• Factors that affect the rate of reaction and explain why this happens.• How to apply knowledge of the states of matter to extend knowledge, in order to explore internal energy.	<ul style="list-style-type: none">• Examples of energy stores and what dissipation of energy is.•
	<p>Our curriculum is designed to develop the following key skills for all students:</p> <ul style="list-style-type: none">• Scientific thinking in which they are able to understand scientific methods and processes and how these develop over time.• Experimental skills, so that students can ask questions based on observations, make predictions using key vocabulary and knowledge learnt throughout the unit of study. Carry out investigations through a series of required practical's and make and record measurements and evaluate methods.• Analytical skills and strategies in which our students competently apply mathematical concepts and calculate results, present and interpret data using tables and graphs, draw conclusions and evaluate data.• Numeracy skills in which students calculate results and manipulate data using scientific formulae, SI units and chemical nomenclature where possible.		
Vocabulary	<p>All lessons, throughout the course, introduce key terminology at the start, to ensure that students know key words and subject terminology. In addition to this, the key terminology for the course is recalled and retrieved through fortnightly homework and there is a full subject glossary at the back of every student's book.</p> <p>In this subject, students also utilise a personal glossary where they are provided with tier 3 vocabulary and allows students to record words that are new to them. These glossaries are used by the teacher to test whether students have learnt and know new words.</p>		
Assessment	<p>Throughout this unit, and throughout the year, students will be formatively assessed on their knowledge and practical skills to ensure that teaching is bespoke to each of their development needs. They are given personalised feedback following homeworks and assessed practicals that helps them to move on with success.</p>		



Students are expected to complete weekly Homework assessments, that test their increasing knowledge base in relation to the unit they have previously studied. Where questions are consistently incorrect with many pupils responding incorrectly, these are addressed in the 'Homework review' tasks in subsequent lessons.

In lessons, there are regular 'low-stakes' quizzes to ensure that students' knowledge base is developing and to help them to retrieve, and commit to memory, key learning points.

Baseline assessments are completed to assess prior learning and identify areas for further exploration.

Mid-point assessments are completed with a focus on writing like a Scientist or applying their knowledge in a variety of tasks/activities.

An end of half term assessment is completed following the completion of GCSE units to provide summative assessment of learning and provide students with bespoke feedback to provide next steps for progress. Students will complete a full round of 3 mock exam papers, one biology paper, one chemistry paper and one physics paper. These papers will be either higher or foundation tier. Higher level

Year 11	Term 1	Term 2	Term 3
Unit Title	<p>Biology: B2: Cell division, B12: Reproduction, B13: Variation and evolution, B14: Genetics and evolution.</p> <p>Chemistry: C4: Chemical Calculations.</p> <p>Physics: P2: Energy transfer by heating, P6: Molecules and Matter, P7: Radioactivity.</p>	<p>Biology: B10: The human nervous system, B11: Hormonal Coordination.</p> <p>Chemistry: C9: Crude oil and fuels, C11: The Earth's atmosphere, C12: The Earth's resources.</p> <p>Physics: P11: Wave properties, P12: Electromagnetic waves, P13: Electromagnetism</p>	<p>Students will be using this time to complete walking talking mocks as well as exam practice, in readiness for the terminal GCSE examinations. Our results from assessments will mean that students and classes may be completing bespoke activities to support individual and groups of students in achieving their best outcome in their GCSEs.</p>
Key Knowledge and Understanding that, where necessary, enables skill building.	<p>Lesson Objectives in our Medium Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • The process of meiosis in producing reproductive cells to produce variation. • How DNA was discovered and how it creates variation within species. • How natural selection has driven evolution and know how different organisms are classified. • Use knowledge of dominant and recessive alleles to predict the probability of inheritance. 	<p>Lesson Objectives in our Medium Term Plans are sequenced to ensure that students know and understand the following:</p> <ul style="list-style-type: none"> • The nervous system responses and how important the reflex system is to the body, in order to keep us safe. • What homeostasis is and how to describe changes that the body will undergo so it can function as normal. For example, during the summertime, we sweat to help cool our body down and during the winter time, our body will shiver to help generate heat to keep us warm. 	



	<ul style="list-style-type: none">• How we can calculate the amounts of different elements in a compound and predict the mass of reactants and products in reactions using moles.• What different types of nuclear radiation are, how they are harmful and what they can be used for.	<ul style="list-style-type: none">• How fossil fuels are formed, refined and made useful.• How natural and human activities have changed our atmosphere over the last 4.5 billion years.• What properties transverse and longitudinal waves have and how to compare them.• How different wavelengths create different properties and uses in the electromagnetic spectrum.• How magnets, electromagnets and motors are produced and how they are used in everyday life.	
	<p>The key skills that we are introducing are</p> <ul style="list-style-type: none">• Scientific thinking in which they are able to understand scientific methods and processes and how these develop over time.• Experimental skills so that students can ask questions based on observations, make predictions using key vocabulary and knowledge learnt throughout the unit of study. Carry out investigations through a series of required practical's and make and record measurements and evaluate methods.• Analytical skills and strategies in which our students competently apply mathematical concepts and calculate results, present and interpret data using tables and graphs, draw conclusions and evaluate data. <p>Numeracy skills in which students calculate results and manipulate data using scientific formulae, SI units and chemical nomenclature where possible.</p>		
Vocabulary	<p>All lessons, throughout the course, introduce key terminology at the start, to ensure that students know key words and subject terminology. In addition to this, the key terminology for the course is recalled and retrieved through fortnightly homework and there is a full subject glossary at the back of every student's book.</p> <p>In this subject, students also utilise a personal glossary where they are provided with tier 3 vocabulary and allows students to record words that are new to them. These glossaries are used by the teacher to test whether students have learnt and know new words.</p>		
Assessment	<p>Throughout this unit, and throughout the year, students will be formatively assessed on their knowledge and practical skills to ensure that teaching is bespoke to each of their development needs. They are given personalised feedback following homeworks and assessed practicals that helps them to move on with success.</p>		



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In lessons, there are regular 'low-stakes' quizzes to ensure that students' knowledge base is developing and to help them to retrieve, and commit to memory, key learning points.

Baseline assessments are completed to assess prior learning and identify areas for further exploration.

Mid-point assessments are completed with a focus on writing like a Scientist or applying their knowledge in a variety of tasks/activities.

An end of half term assessment is completed following the completion of GCSE units to provide summative assessment of learning and provide students with bespoke feedback to provide next steps for progress. Students will complete a full round of 6 mock exam papers, two biology papers, two chemistry papers and two physics papers. These papers will be either higher or foundation tier.

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