



Ansford Academy

Science

Curriculum Booklet for 2024 - 2025

Subject Lead: Mr Haydn Kershaw

Science Curriculum Intent

Science education is one of the keys to social mobility. Science qualifications open the doors to many rewarding and interesting careers, and scientific literacy is critically important to being an informed citizen. Science is the most powerful method humans have for understanding the world.

Sir John Holman

We aim to ensure that our students not only develop a love for learning Science, but acquire the knowledge they need to become active and healthy citizens in modern society, and to enable them to reach their full potential, regardless of their background, able to continue to study Science beyond GCSE should they choose to do so.

At Ansford Academy, we aim to support all learners, regardless of background, to achieve their full potential. Our curriculum is designed to engender high aspirations and to support our students to reach their full potential; we do this by providing them with the resources, support and challenge they need both in lessons and away from the classroom.

Over their 5-year journey, learners grow and develop into scientifically literate young adults. We want our students to recognise that Science seeks to explain the world, to learn about the differences between each Science and to learn about the different ways scientists work. We break down the knowledge into key concepts which are taught in the separate disciplines of Biology, Chemistry and Physics from year 7 onward and carefully sequence them so that knowledge is introduced in a logical order over a 5 year journey. We want our students to retain this knowledge long term and be able to apply it to explain the world around them.

We aim to encourage the natural curiosity of our students and as such we ensure that they have the knowledge and skills required to learn through carrying out practical experiments and eventually to be able to design investigations which answer their own questions.

We want our students to become scientifically literate. To be able to read and understand scientific articles in the news or in literature, to communicate their understanding effectively and with confidence and to understand and engage with scientific issues so that they can form valid opinions and make informed decisions. Reading in our school is part of the culture. We want children to love reading and as such our Science curriculum is designed to encourage reading.

Our curriculum is also designed to ensure that our students develop a knowledge of how science relates to social, moral, spiritual and cultural issues as well as the scope and limitations of science in this regard. The science curriculum is therefore more than a description of the journey towards expertise. It is also the means by which to get there.

Ansford offers students the opportunity to take the three separate sciences so that students can go beyond the statutory KS4 programme of study. Our students are equipped to help themselves make progress and become self-aware, literate scientists ready for the demands of examinations. Most importantly, our curriculum enables students to access future academic or vocational A level and Certificate courses post-16.

Science Curriculum Implementation

The school is currently transitioning its curriculum so that it follows the MNSP Science Curriculum. The new curriculum model has been implemented at KS3. The legacy curriculum model will remain in place for KS4 this year, but new resources are embedded where possible.

Our science team carefully sequences students' learning to ensure knowledge is introduced in a logical order, allowing them to retain and build on their knowledge. Key skills in Science are developed throughout the academic year, for example students will learn how scientists prepare and carry out experiments. Topics are sequenced carefully to build on prior learning, with topics being revisited, to ensure knowledge acquisition is in a logical order and to prevent any misconceptions becoming embedded. Literacy is a key focus, with the use of scientific terminology that enables students to confidently explain their understanding.

A range of differentiated activities are provided to students, including challenge tasks for students and support and scaffolding of tasks for those who require more support. Students have regular low stakes tests to inform the next steps of learning and regular formative assessments so that students who are not making the required levels of progress are identified and further supported. Students are given time to evaluate their assessments and use these as a further learning tool to correct misconceptions.

Key Stage 3

As students come to Ansford Academy from many different feeder schools, we use the Trust's Baseline Assessment to accurately pinpoint gaps in prior learning. We teach in mixed ability groups classes, which in Year 7 is based around Tutor groups to support effective transition into Secondary School, and in Year 8 and 9 is fully mixed across the year group. All students have access to the same curriculum but those students with lower KS2 prior attainment are given support to reach the same objectives through scaffolding of tasks.

Throughout Year 9, students start the transition to the GCSE course with topics that bridge the end of Key stage 3 and the beginning of key Stage 4. Key knowledge and concepts from KS3 are carried forward into KS4 and this time is also used to make links to new knowledge.

Key Stage 4

Most students follow the AQA Combined Science: Trilogy specification and some students increase to the AQA Separate Science specification as part of their Options choices. Trilogy is taught in bands, split loosely around higher and foundation tier entry. Separate Science is taught as one group across both the Science and Option timetable allocations.

Allocated Curriculum Time:

	Year 7	Year 8	Year 9	Year 10	Year 11
Lessons per fortnight	7	7	7	Trilogy: 9 Separate Sci: 14	Trilogy: 9 Separate Sci: 14

Year 7 Programme of Study

Term	Curriculum Foci	Formal Assessment
1	<p>Introduction to Science</p> <ul style="list-style-type: none"> ● Introduction to How Science Works <p>Cells</p> <ul style="list-style-type: none"> ● Cells, tissues and organs <p>Particles</p> <ul style="list-style-type: none"> ● The different properties of matter in solid, liquid or gas form ● Particle model and changes of state ● Diffusion 	<p>Assessment 1: MNSP Baseline Assessment Time: 40 mins</p>
2	<p>Elements, atoms and compounds</p> <ul style="list-style-type: none"> ● Introducing the chemical building blocks of all matter ● Elements and compounds <p>Forces</p> <ul style="list-style-type: none"> ● Measuring forces ● Drag forces and friction, balanced vs unbalanced forces 	<p>Assessment 2: Summative assessment for topics studied this term Time: 40 mins</p>
3	<p>Energy</p> <ul style="list-style-type: none"> ● Understanding energy changes and transfers ● Thermal energy and temperature <p>Body structure and systems</p> <ul style="list-style-type: none"> ● Overview of various organ systems ● Respiratory system and nervous system 	<p>Assessment 3: Summative assessment for topics studied this term Time: 40 mins</p>
4	<p>Plant and animal reproduction</p> <ul style="list-style-type: none"> ● Reproductive systems ● The menstrual cycle fertilisation and development of a foetus ● Flowers and pollination; fertilisation, germination and seed dispersal <p>Separating mixtures</p> <ul style="list-style-type: none"> ● Mixtures and solutions ● Evaporation, distillation and chromatography 	<p>Assessment 4: Summative assessment for topics studied this term Time: 40 mins</p>
5	<p>Introduction to reactions</p> <ul style="list-style-type: none"> ● Different types of reactions ● Conservation of mass <p>Sound and Waves</p> <ul style="list-style-type: none"> ● Sound and waves ● Types of wave ● Sound; loudness and pitch 	<p>Assessment 5: End of Year Exam Time: 1 hour</p>
6	<p>The Earth and Space</p> <ul style="list-style-type: none"> ● The solar system and phases of the moon ● Structure of the earth ● Rocks <p>Interdependence</p> <ul style="list-style-type: none"> ● Food chains. webs and ecosystems 	<p>Assessment 6: Summative assessment for content in Term 6 Time: 40 mins</p>

Year 8 Programme of Study

Term	Curriculum Foci	Formal Assessment
1	<p>The Periodic Table</p> <ul style="list-style-type: none"> ● Groups and Periods, metals and non-metals ● Group 1 metals vs Group 7 and the noble gases <p>Photosynthesis and respiration</p> <ul style="list-style-type: none"> ● Photosynthesis and leaf structure ● Aerobic and anaerobic respiration 	<p>Assessment 1: MNSP Baseline Assessment Time: 40 mins</p>
2	<p>Motion and pressure</p> <ul style="list-style-type: none"> ● Motion graphs, speed and velocity ● Pressure and turning forces <p>Acids and alkalis</p> <ul style="list-style-type: none"> ● Features of acids and alkalis ● Litmus, universal indicator and making other indicators <p>Health and digestion</p> <ul style="list-style-type: none"> ● Energy in food and food tests ● Balanced diet and digestion, drugs, alcohol and smoking 	<p>Assessment 2: Summative assessment for topics studied this term Time: 40 mins</p>
3	<p>Light</p> <ul style="list-style-type: none"> ● Reflection and refraction ● The eye and the camera <p>Metals and acids</p> <ul style="list-style-type: none"> ● Metals and acids. metals and oxygen, metals and water ● Displacement reactions 	<p>Assessment 3: Summative assessment for topics studied this term. Time: 40 mins</p>
4	<p>Energy resources</p> <ul style="list-style-type: none"> ● The use of energy resources ● Energy in food <p>Chemical Energy</p> <ul style="list-style-type: none"> ● Endothermic and exothermic reactions ● Experimental Designs <p>Adaptations Variation and evolution</p> <ul style="list-style-type: none"> ● Competition and variation ● Natural selection, extinction, Adaptations, variation, inheritance 	<p>Assessment 4: Summative assessment for topics studied this term Time: 40 mins</p>
5	<p>Magnets and Electromagnets</p> <ul style="list-style-type: none"> ● Magnetic fields and magnetic interactions ● Making magnets and electromagnets, electric motors <p>Microbes and Disease</p> <ul style="list-style-type: none"> ● Types and causes of disease ● Treating diseases 	<p>Assessment 5: End of year exam on topics from Y7 and Y8 Time: 1 hour</p>
6	<p>Atmosphere</p> <ul style="list-style-type: none"> ● Composition of the Earth's atmosphere ● Resources from the ground <p>Electricity</p> <ul style="list-style-type: none"> ● Conductors and insulators ● Series and parallel circuits ● Resistance in circuits 	<p>Assessment 6: Summative assessment for topics studied this term Time: 40 mins</p>

Year 9 Programme of Study

Term	Curriculum Foci	Formal Assessment
1	<p>Particle model of matter</p> <ul style="list-style-type: none"> ● Particle behaviour of states and the changes of state ● Density of materials <p>Cell Biology</p> <ul style="list-style-type: none"> ● Use microscopes to explore the structure of cells ● Identify the organelles and their functions ● Investigating the processes of diffusion and osmosis 	<p>Assessment 1: Summative assessment for topics studied this term Time: 40 mins</p>
2	<p>Organic Chemistry</p> <ul style="list-style-type: none"> ● Hydrocarbons ● Fractional distillation ● Cracking <p>Atmosphere and the Earth's Resources</p> <ul style="list-style-type: none"> ● The Earth's early and present atmosphere ● The Carbon Cycle ● Potable water 	<p>Assessment 2 : Summative assessment for topics studied this term Time: 40 mins</p>
3	<p>Organisation</p> <ul style="list-style-type: none"> ● Digestive system and investigating enzyme action, ● The circulatory system and Healthy Lifestyles ● Plant organisation and photosynthesis <p>Chemical Analysis</p> <ul style="list-style-type: none"> ● Separation techniques ● Purity and Formulations 	<p>Assessment 3: Summative assessment for topics studied this term Time: 40 mins</p>
4	<p>Organisation (continued)</p> <ul style="list-style-type: none"> ● Digestive system and investigating enzyme action, ● The circulatory system and Healthy Lifestyles ● Plant organisation and photosynthesis <p>Atomic Structure</p> <ul style="list-style-type: none"> ● Exploring the nucleus of the Atom ● Nuclear Radiation ● Medical applications of Radiation 	<p>Assessment 4: Summative assessment for topics studied this term</p>
5	<p>Knowledge Retrieval</p> <ul style="list-style-type: none"> ● Revision and preparation for end of year exam ● Each teacher will focus on key areas 	<p>Assessment 5: End of KS3 Exams. Time: 1 hour</p>
6	<p>Using resources</p> <ul style="list-style-type: none"> ● Life cycle analyses ● Carry out practical to identify gases ● Identify ions experimentally ● How thermal energy is transferred through the universe <p>Rates of Reaction</p> <ul style="list-style-type: none"> ● Collision Theory ● Measuring the rate of reaction 	<p>Assessment 6: Summative Assessment Time: 40 mins</p>

Year 10 GCSE Science Programme of Study (Trilogy and Separate Sciences (SS))
Exam Board: AQA

Term	Curriculum Foci (Single only) indicates additional Single Science content	Formal Assessment
1	<p>C2 Bonding and Structure and the Particles of Matter</p> <ul style="list-style-type: none"> ● Ionic, covalent and metallic bonding ● Giant covalent structures ● Intermolecular forces <p>P2 Electricity</p> <ul style="list-style-type: none"> ● Electrical components , current and p.d. ● Electricity in the Home ● Static electricity and electric fields (SS only) <p>B2 Organisation</p> <ul style="list-style-type: none"> ● Digestive system and investigating enzyme action, ● The circulatory system and Healthy Lifestyles ● Plant organisation and photosynthesis 	<p>Assessment 1: Summative assessment for topics studied this term Time: 40 mins</p>
2	<p>C3 Quantitative Chemistry</p> <ul style="list-style-type: none"> ● Balancing equations and conserving mass ● Calculating moles ● Relative formula mass ● Calculate volumes of gases, ● % yield, (SS only) ● atom economy, (SS only) ● titrations (SS only) <p>P3 Particle model of matter</p> <ul style="list-style-type: none"> ● Particle behaviour of states and the changes of state ● Density of materials 	<p>Assessment 2: Summative assessment for topics studied this term Time: 40 mins</p>
3	<p>B3 Infection and Disease</p> <ul style="list-style-type: none"> ● Working with Microorganisms ● Disease transmission ● Monoclonal antibodies (SS only) ● Plant diseases <p>C4 Chemical Changes</p> <ul style="list-style-type: none"> ● Reactivity Series ● Quantitative Chemistry ● Electrolysis and Energy Change ● Titrations, (SS only) ● Cells and batteries, (SS only) ● Properties of transition metals (SS only) 	<p>Assessment 3: Summative assessment for topics studied this term Time: 40 mins</p>
4	<p>P4 Atomic Structure</p> <ul style="list-style-type: none"> ● Exploring the nucleus of the Atom ● Nuclear Radiation ● Medical applications of Radiation ● Uses and dangers of radioactivity (SS only) ● Nuclear fission and fusion (SS only) <p>B4 Photosynthesis and respiration</p> <ul style="list-style-type: none"> ● Investigating photosynthesis ● Respiration and the effects of exercise 	<p>Assessment 4: Summative assessment for topics studied this term Time: 40 mins</p>
5	<p>C5 Energy Changes</p> <ul style="list-style-type: none"> ● Energy in reactions: Exothermic and endothermic <p>B7 Ecology</p>	<p>Assessment 5: Summative assessment for topics studied this term</p>

	<ul style="list-style-type: none"> Habitats and biodiversity Food, chains webs and sampling techniques Effect of Humans on the Environment Recycling nutrients in ecosystems. (SS only) <p>P6 Space (Single only)</p> <ul style="list-style-type: none"> Astrological bodies (SS only) Life cycle of stars (SS only) History of the Universe (SS only) 	Time: 40 mins
6	<p>Revision</p> <ul style="list-style-type: none"> Revision and preparation for exam Knowledge recall exercises <p>C6 Rates of Reaction</p> <ul style="list-style-type: none"> Collision Theory Measuring the rate of reaction 	Assessment 6: End of Y10 GCSE Exams: Paper 1 for Bio Paper 1 for Chem Paper 1 for Phy

Year 11 GCSE Science Programme of Study
Exam Board: AQA

Term	Curriculum Foci (S only) indicates additional separate Science content	Formal Assessment
1	<p>P5 Forces and Motion</p> <ul style="list-style-type: none"> Investigating forces Resultant forces, analysing graphical data Investigating Acceleration and terminal velocity Forces and Braking Moments, including levers and gears (SS only) Momentum during collisions or explosions (SS only) <p>B5 Homeostasis and Response</p> <ul style="list-style-type: none"> The central Nervous System and reaction times The Endocrine System Blood Sugar Levels The Menstrual Cycle, contraception and fertility <p>C7 Organic Chemistry</p> <ul style="list-style-type: none"> Hydrocarbons Fractional distillation Cracking 	Assessment 1: Summative assessment for topics studied this term Time: 40 mins
2	<p>C8 Chemical Analysis</p> <ul style="list-style-type: none"> Separation techniques Purity and Formulations <p>P6 Waves</p> <ul style="list-style-type: none"> Properties and types of waves Reflection and refraction Electromagnetic spectrum Applications of waves to everyday life (SS only) Constructing wave diagrams (SS only) Colours, (SS only) Absorption and reflection (SS only) 	Assessment 2: Mock GCSE Exams: Paper 1 Biology Paper 1 Chem Paper 1 Phys
3	<p>B6 Inheritance, Variation and evolution</p> <ul style="list-style-type: none"> Genetics and Inheritance Inheritance and The theory of evolution Investigate how genetic engineering and cloning work 	Assessment 3: Summative assessment for topics studied this

	C9 Atmosphere and the Earth's Resources <ul style="list-style-type: none"> • The Earth's early and present atmosphere • The Carbon Cycle • Potable water 	term Time: 40 mins
4	P7 Magnetism <ul style="list-style-type: none"> • Types of magnets and magnetic fields • The motor effect • Electromagnetic induction and generators. (SS only) • Transformers (SS only) C10 Using resources <ul style="list-style-type: none"> • Life cycle analyses • Carry out practical to identify gases • Distinguish between formulations and pure substances • Identify ions experimentally • How thermal energy is transferred through the universe • Corrosion, rusting and alloys (SS only) • Ceramics, polymers and composite materials (SS only) • Explain the Haber Process, and NPK fertilisers (SS only) 	Assessment 4: Mock GCSE Exams: Paper 2 Biology Paper 2 Chemistry, Paper 2 Physics
5	Revision <ul style="list-style-type: none"> • Revision and preparation for exam • Knowledge recall exercises 	Targeted assessment and feedback for key cohorts

Revision and Support

There are many ways in which you can support your child in the study of Science such as:

- Create revision resources: mind maps, storyboards, cue cards
- Purchase CGP Science revision guide (this can be done through parent pay at a discounted price)
- Use DRIP sheets and practice papers to consolidate knowledge and practice exam technique (these are distributed to students by class teachers but electronic copies can be found via [science curriculum online](#))
- Revision Calendars and revision tracking sheets
- Encourage attendance to additional modular revision sessions (these run after school between January and April)
- Use online revision resources
 - BBC Bitesize: <https://www.bbc.co.uk/bitesize/examspecs/z8r997h>
 - Seneca: <https://senecalearning.com/en-GB/>

Final GCSE Assessment Structure - Trilogy

Subject	Weighting	Content	Proposed Date of Examination
Biology	33.3%	<p>Paper 1 - 1 hour and 15 mins</p> <ol style="list-style-type: none"> 1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics <p>Paper 2 - 1 hour and 15 mins</p> <ol style="list-style-type: none"> 1. Homeostasis and response 2. Inheritance, variation and evolution 3. Ecology 	May/June of Year 11
Chemistry	33.3%	<p>Paper 1 - 1 hour and 15 mins</p> <ol style="list-style-type: none"> 1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes 5. Energy changes <p>Paper 2 - 1 hour and 15 mins</p> <ol style="list-style-type: none"> 1. The rate and extent of chemical change 2. Organic chemistry 3. Chemical analysis 4. Chemistry of the atmosphere 5. Using resources 	May/June of Year 11
Physics	33.3%	<p>Paper 1 - 1 hour and 15 mins</p> <ol style="list-style-type: none"> 1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure <p>Paper 2 - 1 hour and 15 mins</p> <ol style="list-style-type: none"> 1. Forces 2. Waves 3. Magnetism and electromagnetism 	May/June of Year 11

Please see exam board websites for up to date information:

<https://www.aqa.org.uk/subjects/science/gcse/combined-science-trilogy-8464>

Final GCSE Assessment Structure - Separate Sciences

Subject	Weighting	Content	Proposed Date of Examination
Biology	33.3%	<p>Paper 1 - 1 hour and 45 mins</p> <ul style="list-style-type: none"> 5. Cell biology 6. Organisation 7. Infection and response 8. Bioenergetics <p>Paper 2 - 1 hour and 45 mins</p> <ul style="list-style-type: none"> 4. Homeostasis and response 5. Inheritance, variation and evolution 6. Ecology 	May/June of Year 11
Chemistry	33.3%	<p>Paper 1 - 1 hour and 45 mins</p> <ul style="list-style-type: none"> 6. Atomic structure and the periodic table 7. Bonding, structure, and the properties of matter 8. Quantitative chemistry 9. Chemical changes 10. Energy changes <p>Paper 2 - 1 hour and 45 mins</p> <ul style="list-style-type: none"> 6. The rate and extent of chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources 	May/June of Year 11
Physics	33.3%	<p>Paper 1 - 1 hour and 45 mins</p> <ul style="list-style-type: none"> 5. Energy 6. Electricity 7. Particle model of matter 8. Atomic structure <p>Paper 2 - 1 hour and 45 mins</p> <ul style="list-style-type: none"> 4. Forces 5. Waves 6. Magnetism and electromagnetism 7. Space 	May/June of Year 11

Please see exam board websites for up to date information:

<https://www.aqa.org.uk/subjects/science/gcse/biology-8461>

<https://www.aqa.org.uk/subjects/science/gcse/chemistry-8462>

<https://www.aqa.org.uk/subjects/science/gcse/physics-8463>