



PYRLAND SCHOOL

Science

Curriculum Booklet for 2025 - 2026

Subject Lead: Miss Waller

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. We will enable them to reach their full potential, regardless of their background and be able to continue to study science beyond GCSE level should they choose to do so.

At Pyrland School, we aim to support all learners, regardless of background to achieve their full potential. Our curriculum is fully inclusive to meet the needs of students with lower-than-average reading ages and those with English as an Additional Language. Because of this we centre reading in the curriculum and provide opportunities for teachers to explicitly teach the reading and comprehension of scientific material. To meet the needs of all learners, our curriculum expectations are high and is ambitious for all.

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 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 far more than just a list of knowledge we intend for students to learn; it is our hope and ambition for the scientists of the future.

Science Curriculum Implementation:

At Pyrland we make our curriculum clear to teachers and to students by implementing Core Questions and Answers. These questions detail exact knowledge that is to be taught by teachers in each individual lesson. Over their 5-year journey, learners grow and develop into scientifically literate young adults. 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.

All lessons at Pyrland begin with a Do Now task. In science lessons, the questions for this task are taken from that topic's Core Questions and from previous ones. This ensures students are getting plenty of retrieval practice, so they learn each concept thoroughly. Teachers will then engage students using a context-based starter, then plan and deliver a quality explanation. Students will have the opportunity to build on their learning through responsive teaching and then apply their new learning through a range of activities. Teachers then focus on supporting students who need more help with the content.

Key Stage 3

In Year 7 and Year 8 the focus is on building the foundational knowledge needed for future study. 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. Please be aware that we have started working with MNSP and are currently transitioning to follow their Science Curriculum

Key Stage 4

Most students follow the AQA Combined Science: Trilogy specification and some students in Year 11 opt to increase to the AQA Separate Science specification. Knowledge is carefully sequenced to ensure continuity of learning, ensuring knowledge is built over time, whilst allowing opportunities to revisit and embed key points. The Combined Science course aligns with the central MNSP curriculum, allowing us to take advantage of resources provided.

Our students are given time to evaluate assessments and correct misconceptions before moving onto new topics. This means our students are equipped to help themselves make progress and become self-aware, literate scientists ready for the demands of examinations and able to access future academic or vocational A level and Certificate courses

Allocated Curriculum Time:

	Year 7	Year 8	Year 9	KS4: Trilogy	KS4: Separate Science
Lessons per fortnight	6	6	6	10	10

Year 7 Programme of Study

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

Year 8 Programme of Study

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

Year 9 Programme of Study

Term	Curriculum Foci	Formal Assessment
1	Particle Model of Matter <ul style="list-style-type: none"> Particle behaviour of states and the changes of state Density of materials Cell Biology <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 	Assessment 1: Summative assessment for topics studied this term Time: 40 mins
2	Organic Chemistry <ul style="list-style-type: none"> Hydrocarbons Fractional distillation Cracking Atmospheric Chemistry <ul style="list-style-type: none"> The Earth's early and present atmosphere Carbon footprints 	Assessment 2 : Summative assessment for topics studied this term Time: 40 mins
3	Organisation <ul style="list-style-type: none"> Digestive system and investigating enzyme action, The circulatory system and Healthy Lifestyles Plant organisation and photosynthesis Chemical Analysis <ul style="list-style-type: none"> Separation techniques Purity and Formulations 	Assessment 3: Summative assessment for topics studied this term Time: 40 mins
4	Organisation (continued) <ul style="list-style-type: none"> Digestive system and investigating enzyme action, The circulatory system and Healthy Lifestyles Plant organisation and photosynthesis Atomic Structure (Physics) <ul style="list-style-type: none"> Exploring the nucleus of the Atom Nuclear Radiation Medical applications of radiation 	Assessment 4: Summative assessment for topics studied this term
5	Knowledge Retrieval <ul style="list-style-type: none"> Revision and preparation for end of year exam Each teacher will focus on key areas 	Assessment 5: End of KS3 Exams. Time: 1 hour
6	Using resources <ul style="list-style-type: none"> Life cycle analysis Potable Water Water treatment Rates of Reaction <ul style="list-style-type: none"> Collision Theory Measuring the rate of reaction 	Assessment 6: Summative Assessment Time: 40 mins

Year 10 Programme of Study: Trilogy
Examboard: AQA Trilogy

Term	Curriculum Foci	Formal Assessment
1	Atomic Structure (Chemistry) <ul style="list-style-type: none"> Structure and history of the atom The Periodic Table Atoms, elements, compounds and isotopes Electricity <ul style="list-style-type: none"> Electrical components and investigating the rules of circuits Electricity in the Home 	Assessment 1: Summative assessment for topics studied this term Time: 40 mins
2	Bonding and Structure and the Particles of Matter <ul style="list-style-type: none"> Ionic, covalent and metallic bonding Giant covalent structures Intermolecular forces Energy transfers and Energy resources <ul style="list-style-type: none"> Calculating energy changes Energy Efficiency Renewable and non-renewable resources 	Assessment 2: Summative assessment for topics studied this term Time: 40 mins
3	Energy Changes <ul style="list-style-type: none"> Energy in reactions Exothermic and endothermic reactions Homeostasis and Response <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 	Assessment 3: Summative assessment for topics studied this term Time: 40 mins
4	Infection and Disease <ul style="list-style-type: none"> Working with Microorganisms Disease transmission Plant diseases Forces <ul style="list-style-type: none"> Investigating forces Resultant forces, analysing graphical data Forces and Motion <ul style="list-style-type: none"> Investigating Acceleration and terminal velocity Forces and Braking	Assessment 4: Summative assessment for topics studied this term Time: 40 mins
5	Photosynthesis and respiration <ul style="list-style-type: none"> Investigating photosynthesis Respiration and the effects of exercise Knowledge Retrieval <ul style="list-style-type: none"> Revision and preparation for end of year exam 	Assessment 5: Summative assessment for topics studied this term Time: 40 mins
6	Knowledge Retrieval <ul style="list-style-type: none"> Revision and preparation for end of year 	Assessment 6: End of Y10 Mock GCSE Exams

Year 11 Programme of Study: Trilogy
ExamBoard: AQA Trilogy

Term	Curriculum Foci	Formal Assessment
1	Ecology <ul style="list-style-type: none"> Habitats and biodiversity Food, chains webs and sampling techniques Effect of Humans on the Environment Chemical Changes <ul style="list-style-type: none"> Reactivity Series Quantitative Chemistry Electrolysis and Energy Changes 	Assessment 1: Summative assessment for topics studied this term Time: 40 mins
2	Inheritance, Variation and evolution <ul style="list-style-type: none"> Genetics and Inheritance Inheritance and The Theory of Evolution Investigate how genetic engineering and cloning work Quantitative Chemistry <ul style="list-style-type: none"> Balancing equations Calculating moles Relative formula mass Conserving mass 	Assessment 2: Mock GCSE Exams: Paper 1 Biology Paper 2 Chemistry Paper 1 Physics
3	Waves <ul style="list-style-type: none"> Properties and types of waves Reflection and refraction Electromagnetic spectrum Magnetism <ul style="list-style-type: none"> Types of magnets and magnetic fields The motor effect 	Assessment 3: Summative assessment for topics studied this term Time: 40 mins
4	Revision <ul style="list-style-type: none"> Revision and preparation for exam Knowledge recall exercises 	Assessment 4: Mock GCSE Exams: Paper 2 Biology Paper 1 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

Year 11 Programme of Study: Single Science Legacy Model (2025-2026 only)

We are transitioning from our existing curriculum model to the MNSP curriculum model. For continuity and to ensure coverage of all content the existing curriculum model will stand for the Single Science students in Year 11. Due to the modular nature of the course, we will be able to take advantage of Teaching, Learning and Assessment resources provided by the Trust.

Term	Curriculum Foci	Formal Assessment
1	Homeostasis and Response <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 Chemical Analysis <ul style="list-style-type: none">• Separation techniques• Purity and Formulations• Testing of Ions• Spectroscopic Techniques	Assessment 1: Summative assessment for topics studied this term Time: 40 mins
2	Inheritance, Variation and evolution <ul style="list-style-type: none">• Genetics and Inheritance• Inheritance and The Theory of Evolution• Investigate how genetic engineering and cloning work Waves <ul style="list-style-type: none">• Properties and types of waves• Reflection and refraction• Electromagnetic spectrum	Assessment 2: Mock GCSE Exams: Paper 1 Biology Paper 2 Chemistry Paper 1 Physics
3	Magnetism <ul style="list-style-type: none">• Types of magnets and magnetic fields• The motor effect Using resources <ul style="list-style-type: none">• Life cycle analysis• Potable Water• Sustainability and carbon footprint	Assessment 3: Summative assessment for topics studied this term Time: 40 mins
4	Revision <ul style="list-style-type: none">• Revision and preparation for exam• Knowledge recall exercises	Assessment 4: Mock GCSE Exams: Paper 2 Biology Paper 1 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

Final Science GCSE Assessment Structure – AQA Trilogy

Component	Weighting (%)	Content	Proposed Examination Date
Biology	33.3%	<p>Paper 1 - 1 hour and 15 mins</p> <ul style="list-style-type: none"> • Cell biology • Organisation • Infection and response • Bioenergetics <p>Paper 2 - 1 hour and 15 mins</p> <ul style="list-style-type: none"> • Homeostasis and response • Inheritance, variation and evolution • Ecology 	May/June of Year 11
Chemistry	33.3%	<p>Paper 1 - 1 hour and 15 mins</p> <ul style="list-style-type: none"> • Atomic structure and the periodic table • Bonding, structure, and the properties of matter • Quantitative chemistry • Chemical changes • Energy changes <p>Paper 2 - 1 hour and 15 mins</p> <ul style="list-style-type: none"> • The rate and extent of chemical change • Organic chemistry • Chemical analysis • Chemistry of the atmosphere • Using resources 	May/June of Year 11
Physics	33.3%	<p>Paper 1 - 1 hour and 15 mins</p> <ul style="list-style-type: none"> • Energy • Electricity • Particle model of matter • Atomic structure <p>Paper 2 - 1 hour and 15 mins</p> <ul style="list-style-type: none"> • Forces • Waves • 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/science-8464/specification>

Final Science GCSE Assessment Structure – AQA Separate Science

Subject	Weighting	Content	Proposed Date of Examination
Biology	50%	Paper 1 - 1 hour and 45 mins <ul style="list-style-type: none"> • Cell biology • Organisation • Infection and response • Bioenergetics 	May/June of Year 11
	50%	Paper 2 - 1 hour and 45 mins <ul style="list-style-type: none"> • Homeostasis and response • Inheritance, variation and evolution • Ecology 	
Chemistry	50%	Paper 1 - 1 hour and 45 mins <ul style="list-style-type: none"> • Atomic structure and the periodic table • Bonding, structure, and the properties of matter • Quantitative chemistry • Chemical changes • Energy changes 	May/June of Year 11
	50%	Paper 2 - 1 hour and 45 mins <ul style="list-style-type: none"> • The rate and extent of chemical change • Organic chemistry • Chemical analysis • Chemistry of the atmosphere • Using resources 	
Physics	50%	Paper 1 - 1 hour and 45 mins <ul style="list-style-type: none"> • Energy • Electricity • Particle model of matter • Atomic structure 	May/June of Year 11
	50%	Paper 2 - 1 hour and 45 mins <ul style="list-style-type: none"> • Forces • Waves • Magnetism and electromagnetism • Space 	

Please see exam board websites for up to date information:

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

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

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