



Cardinal  
Newman  
CATHOLIC SCHOOL

# Science

## Curriculum Area: Science

*Blessed are your eyes, for they see, and your ears, for they hear.  
Matthew 13:16*

## Curriculum Intent

In science we aim to provide the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science is vital to the world's future prosperity and through the understanding of key foundational knowledge and concepts, pupil will be encouraged to develop a sense of excitement, curiosity and interest about natural phenomena and the world we live in.

For some students studying science will provide the platform for more advanced studies, establishing the basis for a wide range of careers. For others, it will be formal study of subjects that provide the foundations for understanding the natural world and will enhance their lives in an increasingly technological society. Whichever path they take, students should have the knowledge to develop curiosity about the natural world, have an insight into working scientifically and an appreciation of the relevance of science to their everyday lives.

As a department we aim to ensure pupils;

- Gain the required scientific knowledge of the big ideas in science, through the specific disciplines of biology, chemistry and physics.
- Develop an understanding of the nature, processes and methods of science through enquiry, which help them to answer scientific questions about the world around them
- Learn to apply observational, practical, modelling, enquiry, problem-solving skills and mathematical skills, both in the laboratory, in the field and in other environments.
- Gain confidence to evaluate claims based on science through critical analysis of the methods used, evidence and conclusions, both qualitatively and quantitatively.
- Are guided to describe phenomena in the natural world in terms of the key big ideas in science which are interlinked and have universal application.

**Curriculum Overview: Science**

	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10 GCSE Combined Science</b>	<b>Year 11 GCSE Combined Science</b>	<b>Year 12 BTEC Applied Science</b>	<b>Year 13 BTEC Applied Science</b>
<b>HT1</b>	Lab safety and practical skills Book 1: Cells Book 1: Particle model	Book 1: Plant reproduction Book 1: Interdependence Book 1: metals and non-metals Book 1 Contact and non-contact	Chemistry of the atmosphere  Cell Biology	C2 Structure and Bonding B3 Infection and response	C6 The rate and extent of chemical change P5 Forces	Unit 1 Principles and applications of science 1	Unit 5 Unit 5 Principles and applications of science 2 Unit 6 Investigative project
<b>HT2</b>	Book 1: Speed Book 1: Movement Book 1: Separating mixtures	Book 1: pressure Book 1: Variations Book 2: Inheritance Book 1: Acids and alkalis	Physics - The particle model of matter	P1 Energy C3 Quantitative chemistry	B5 Coordination and control P6 Waves	Unit 1 Principles and Applications of Science 1 Unit 2 Practical Scientific Procedures and Techniques Unit 3 Scientific Investigation Skills	Unit 5 Principles and applications of science 2 Unit 6 Investigative project Unit optional choice 1 tbc
<b>HT3</b>	Book 1: Gravity Book 1: Universe Book 1: Human reproduction Book 2: The periodic table	Book 2: Evolution Book 2: Chemical energy Book 2: Work Book 2: Heating and cooling	Atomic structure and the periodic table	C4 Chemical changes C5 Energy changes	C7 Organic chemistry B6 Inheritance variation and evolution	Unit 2 Practical Scientific Procedures and Techniques Unit 3 Scientific Investigation Skills	Unit optional choice 1 tbc Unit optional choice 2 tbc
<b>HT4</b>	Book 1: Energy costs Book 2: Elements Book 2: Breathing	Book 2: Photosynthesis Book 2: Respiration	Biology - Organisation	P2 Electricity	P7 Magnetism and electromagnetism Revision and exam practise	Unit 4 Laboratory Techniques in the Workplace Unit 3 Scientific Investigation Skills	Unit optional choice 1 tbc Unit optional choice 2 tbc

<b>HT5</b>	Book 1: Energy transfers Book 2: Digestion Book 1: Sound	Book 2: Types of reactions Book 1: Voltage resistance and current	Chemistry - Using resources	B4 Bioenergetics	Revision and exam practise	Unit 4 Laboratory Techniques in the Workplace Unit 1 Principles and applications of science 1 revision Unit 5 Principles and applications of science 2	All unit catch up
<b>HT6</b>	Book 1: Light Book 1: Earth Structure	Book 2: Wave effects and properties Book 2: Electromagnets	Physics - Atomic structure	B7 Ecology C8 Chemical analysis		Unit 5 Principles and applications of science 2 Unit 6 Investigative project (introduce for summer planning)	Unit catch up (where needed)

	<b>Year 10</b>	<b>Year 11</b>	<b>Year 12</b>	<b>Year 13</b>
<b>HT1</b>	B3 Infection and Response Lessons 1-12	B6 Variation Lessons 1-10	Module 2 Chapter 2 Basic components of living systems Chapter 3 Biological Molecules	Module 5 Chapter 17 Energy, chapter 18 Respiration Module 6 Chapter 19 Genetics and Chapter 20 Inheritance
<b>HT2</b>	B3 Infection and Response Lessons 13-15	B6 Variation Lessons 11-16 Two weeks revision paper 1 content for Nov Mocks	Chapter 4 Enzymes Chapter 5 Plasma Membranes WTM Exams	Module 5 Chapter 12 Neurones, chapter 14 Hormones Module 6 Chapter 21 Genomes, chapter 22 cloning Two week revision lessons for Mock exams
<b>HT3</b>	Two week revision on lead up to mid-year exam B4 Bioenergetics Lessons 1-4	B7 Ecology Lessons 1-5 Two week revision paper 2 content before 2 <sup>nd</sup> Mock exams	Chapter 6 Cell Division Chapter 9 Transport in Plants Two weeks in lesson revision for Feb Mocks	Module 5 Chapter 15 Homeostasis Module 6 Chapter 23 Ecosystems
<b>HT4</b>	B4 Bioenergetics Lessons 5-8	B7 Ecology to be completed Revision	Chapter 9 Transport in plants Chapter 7 exchange surfaces, Chapter 8 Transport in animals	Module 5 Chapter 16 Plant responses Module 6 Chapter 24 Sustainability One week in lesson revision Mock Exams
<b>HT5</b>	Revision on lead up to End of year Exams BI-4 Paper 1 content B5 Homeostasis and Response Lessons 1-5	Revision	Module 4: Chapter 11 Biodiversity Chapter 10 Classification and evolution Chapter 12 Split between both teachers to complete before EOY exam	Revision Catch up of PAGs if required
<b>HT6</b>	Complete B5 Homeostasis and Control Recap required practicals for paper 1		Complete chapter 12 One week revision for EOY Exam Catch up PAGs	

## Curriculum Overview: Chemistry

	Year 10	Year 11	Year 12	Year 13
<b>HT1</b>	C2 Structure and Bonding and the Properties of Matter Lessons 1-12	C6 The Rate and Extent of Chemical Change Lessons 1-10	Introductory unit on Practical skills Module 1 Foundations in Chemistry Chapter 2 Atoms and Electrons Chapter 3 Compounds, Formulae and Equations Chapter 4 Amounts of Substance – moles in solids and gases	Module 5 Chapter 2 How far? Equilibrium Chapter 5 Redox and electrode potentials Module 6 Chapter 1 Benzene and aromatic compounds Chapter 2 Carbonyl Compounds Chapter 9 Carboxylic acids and derivatives
<b>HT2</b>	C3 Chemical Quantities and Calculations Lessons 1-13	C7 Hydrocarbons Lessons 1-10 Two weeks revision paper 1 content for Nov Mocks	Chapter 5 Amounts of substance – moles in solution Chapter 6 Types of Reaction – precipitation, acid-base and redox Chapter 7 Bonding and Structure WTM exams	Module 5 Chapter 6 Transition elements and qualitative analysis Module 6 Chapter 10 Nitrogen Compounds Two weeks revision lessons for Mock exams
<b>HT3</b>	Two week revision on lead up to mid-year exam C4 Chemical Changes Lessons 1-16	C10 Sustainable Development Lessons 1-10 Two weeks revision paper 2 content before 2 <sup>nd</sup> Mock exams	Module 3 Chapter 8 The Periodic Table and Periodicity Module 4 Chapter 12 Basic Concepts in Organic Chemistry Two weeks in lesson revision for Feb Mocks	Module 5 Chapter 3 Acids, Bases and Buffers Module 6 Chapter 11 Polymers Chapter 12 Organic Synthesis
<b>HT4</b>	C5 Energy Changes Lesson 1-6 Recap C1 from year 9	Recap C9 from year 9 Recap C8 from year 10 Revision	Module 3 Chapter 9 Group 2 and the Halogens, quantitative analysis Chapter 10 Enthalpy Changes Module 4 Chapter 13 Hydrocarbons Chapter 14 Alcohols and Haloalkanes	Module 5 Chapter 4 Enthalpy, Entropy and Free Energy Module 5 and 6 Recap Analysis Techniques and Revision of Organic Chemistry One week in lesson revision Mock Exams

			Environmental Chemistry Project (covers parts of Module 4 and Module 6)	
<b>HT5</b>	Revision on lead up to End of year exam C1-5 Paper 1 content C8 Chemical Analysis Lessons 1-2	Revision	Module 3 Chapter 11 Rates and Equilibria Module 4 Chapter 15 Organic Synthesis and Analytical Techniques	Revision Catch up of PAGs if requires
<b>HT6</b>	C8 Chemical Analysis Lessons 3-8		Module 5(A2)Chapter 1 how Fast Rates of Reaction Module 6 (A2) Chapter 13 Analysis One week revision for EOY Exam PAGs	

### Curriculum Overview: Physics

	Year 10 GCSE Separate Science	Year 11 GCSE Separate Science	Year 12	Year 13
<b>HT1</b>	P1 Energy	P5 Forces	<b>Module 1</b> Practical skills <b>Module 2</b> Ch 2- Foundations of physics Ch 3- Motion <b>Module 4</b> Ch 8- Charge & current Ch 9- Energy, power & resistance Ch 9.1- 9.2	<b>Module 5</b> Ch 18- Gravitational fields Ch 19- Stars <b>Module 6</b> Ch 21- Capacitance
<b>HT2</b>	Recap P3 and P4 covered in year 9	Two weeks revision paper 1 content for Nov Mocks Start P6- Waves	<b>Module 3</b> Ch 4- Forces in action Ch 5- Work, energy & power Ch 6- Materials <b>Module 4</b> Ch 9.3- 9.8	<b>Module 5</b> Ch 20- Cosmology PAGs catch up <b>Module 6</b> Ch 22- Electric fields Ch 23- Magnetic fields Ch 24- Particle Physics

<b>HT3</b>	Two-week revision on lead up to mid-year exam P2 Electricity	P7 Magnetism and electromagnetism (if not completed in year 10) Two-week revision paper 2 content before 2 <sup>nd</sup> Mock exams	<b>Module 3</b> Ch 7- Laws of motion & momentum <b>Module 4</b> Ch 11- Waves I Ch 9.9- 9.11 Ch 10- Electrical circuits Ch 10.1 – 10.3	<b>Module 6</b> Ch 25- Radioactivity Ch 26- Nuclear Physics Ch 27- Medical imaging Ch 27.1 – 27.6
<b>HT4</b>	Finish P2 Recap paper 1 topics Recap required practicals for paper 1	Revision paper 1 content	<b>Module 4</b> Ch 12- Waves 2 Ch 10.4 – 10.6 Ch 13- Quantum Physics	<b>Module 6</b> Ch 27.7 – 27.8 Review ch 20 & 27 <b>Module 5</b> Review of ch 14 -17 (done end of y12) Review ch 19
<b>HT5</b>	Revision on lead up to End of year Exams P1-4 Paper 1 content P8 Space Physics	Revision Paper 1 & 2 content	<b>Module 5</b> Ch 15- Ideal gases Ch 14- Thermal Physics Revision of Y12 concepts Revision of Y12 concepts	(Both teachers) Y12 & Y13 revision PAGs catch-up
<b>HT6</b>	Complete P8 Space Physics P7 Magnetism and electromagnetism (time permitting)	<b>Study leave</b>	<b>Module 5</b> Ch 16- Circular motion Ch 17- Oscillations PAGs catch-up PAGs catch-up	<b>Study leave</b>

### Subject Specific Information

Insert documents on website from departmental area