

# Science

**'Inspiring young scientists of the futures, atom by atom'**

Science surrounds us. It is everywhere in our daily lives – all day, every day! We want Science to inspire students to explore the world around them and recognise and understand this. We aim to excite and enrich with the practical applications of the subject, teaching students that doing science develops our ability to ask questions, collect information, organise and test our ideas, problem-solve and apply what we learn.

Science is a platform for building confidence, developing communication skills, and making sense of the world around us.

	Autumn		Spring		Summer	
B	B6 Inheritance B6 Variation and Evolution	B7 Ecology (Ecosystems)	B7 Ecology (Biodiversity)	Consolidation and application		
C	C7 Organic Chemistry	C8 Chemical Analysis C9 Chemistry of the Atmosphere	C10 Using Resources	Consolidation and application	Revision	Revision
P	P6 Waves and Properties	P6 Electromagnetic Waves	P7 Magnets and Electromagnets	Consolidation and application		

Science homework is an integral part of each students learning journey. Therefore the Science department will issue regular homework. The homework set is designed to:

- Consolidate learning
- Allow further research on subjects
- Develop and practise essential scientific skills
- Provide extra challenge and support for students

Students will be set two pieces of homework per week. One piece will be based on the current learning and the second homework will be a piece of recall work to consolidate previous topic and aid revision. Students studying separate sciences will receive three pieces of homework per week but of a shorter duration.

Homework is not expected to be completed in isolation and we actively encourage parents or any other person to help and support students while completing the tasks set. If a student is having difficulty completing homework they must bring this to the attention of their class teacher who will arrange a time suitable to go over any problem areas.

Unit	Learning Objectives/Outcomes
Inheritance	<ul style="list-style-type: none"> <li>• Reproduction – sexual and asexual</li> <li>• Advantages and disadvantages of sexual and asexual reproduction</li> <li>• DNA</li> <li>• Structure of DNA</li> <li>• Protein synthesis</li> <li>• Genetic inheritance</li> <li>• Inherited disorders</li> <li>• Sex determination</li> <li>• Mendel and genetics</li> </ul>
Evolution	<ul style="list-style-type: none"> <li>• Describe evolution</li> <li>• Natural selection</li> <li>• Variation</li> <li>• Speciation (Biology only)</li> <li>• Selective breeding</li> <li>• Genetic engineering</li> <li>• Cloning (Biology only)</li> <li>• Theory of evolution (Biology only)</li> <li>• Understanding of genetics (Biology only)</li> <li>• Evidence for evolution</li> <li>• Fossils</li> <li>• Extinction</li> <li>• Resistant bacteria</li> <li>• Classification of living organisms</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>• Adaptations / interdependence / competition</li> <li>• Communities</li> <li>• Abiotic factors</li> <li>• Biotic factors</li> <li>• Adaptations</li> <li>• Organisms in an ecosystem</li> </ul>

	<ul style="list-style-type: none"> <li>• Carbon cycle</li> <li>• Decomposition (Biology only)</li> <li>• Impact of environmental change (Biology only)</li> <li>• Biodiversity</li> <li>• Waste management</li> <li>• Land use</li> <li>• Deforestation</li> <li>• Global warming</li> <li>• Maintaining biodiversity</li> <li>• Food production / farming / sustainability</li> </ul>
Organic chemistry	<ul style="list-style-type: none"> <li>• Fractional distillation</li> <li>• Cracking</li> <li>• Hydrocarbons and properties</li> <li>• Alkanes and alkenes</li> <li>• Reactions of alkenes</li> <li>• Alcohols (HIGHER)</li> <li>• Carboxylic acids (HIGHER)</li> <li>• Addition polymerisation, condensation polymerisation</li> <li>• Amino acids</li> </ul>
Chemical analysis	<ul style="list-style-type: none"> <li>• Pure substances</li> <li>• Chromatography</li> <li>• Identification of common gases</li> <li>• Flame tests</li> <li>• Metal hydroxides / carbonates / halides / sulfates</li> <li>• Instrumental methods</li> </ul>
Chemistry of the atmosphere	<ul style="list-style-type: none"> <li>• Gases in the atmosphere</li> <li>• The earth's early atmosphere</li> <li>• Changes in the earth's atmosphere</li> <li>• Greenhouse gases</li> <li>• Human impact on the environment / atmosphere</li> <li>• Climate change</li> <li>• Carbon footprint</li> <li>• Atmospheric pollutants from fuels</li> </ul>
Using resources	<ul style="list-style-type: none"> <li>• Earth's resources</li> <li>• Water/water treatment</li> <li>• Extracting metals</li> <li>• Recycling</li> <li>• Haber process</li> <li>• Production and uses of NPK fertilisers</li> </ul>
Waves	<ul style="list-style-type: none"> <li>• Transverse and longitudinal waves</li> <li>• Wave diagrams</li> <li>• Calculating wave frequency</li> </ul>

	<ul style="list-style-type: none"> <li>• Wave speed</li> <li>• Measuring speed of waves</li> <li>• Reflection of waves and ray diagrams (Physics)</li> <li>• Sound waves (Physics)</li> <li>• Hearing</li> <li>• Ultrasound and uses (Physics)</li> <li>• Electromagnetic waves and spectrum</li> <li>• Refraction</li> <li>• Properties of EM waves</li> <li>• Uses of EM waves</li> <li>• Lenses (Physics)</li> <li>• Convex and concave lenses (Physics)</li> <li>• Lenses and ray diagrams (Physics)</li> <li>• Magnification (Physics)</li> <li>• Colours and filters</li> <li>• Emission and absorption of infrared radiation</li> <li>• Radiation and temperature</li> </ul>
Magnets and electromagnets	<ul style="list-style-type: none"> <li>• Poles of a magnets</li> <li>• Magnetic fields</li> <li>• Electromagnets</li> <li>• Flemings left hand rule (HT)</li> <li>• Electric motors (HT)</li> <li>• Loudspeaker (HT)</li> <li>• Induced potential (HT)</li> <li>• Uses of generator effect (HT)</li> <li>• Microphones (HT)</li> <li>• Transformers (HT)</li> </ul>