

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
	Introduction to science		
1	Particle model/ changes of state	Reproduction- human and plants	Interdependence, cycling materials, human impact on environment
2	Cells and organisation	Elements, compounds, mixture and separation	Climate and earth's resources
3		Forces	

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

At lower school (year 7-9) students will be set one piece of homework per week based on the skills and content that is currently being covered in lessons.

At upper school (year 10-11) 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
Particle model / changes of state	<ul style="list-style-type: none"> • Explain the properties of solids / liquids / gases based on the particle arrangement • Explain diffusion in terms of particles in terms of particles and Brownian motion • Explain the effect of increase or decrease in gas pressure • Explain how changes of state occur in terms of particle motion • Explain the shape of a change of state graph • Use particle diagrams to explain the mass during a change of state
Cells and organisation	<ul style="list-style-type: none"> • Explain the functions of each part of a cell e.g. nucleus • Explain how a specialised cell is adapted for its function • Use a microscope to observe and record accurate features of a cell • Explain how a physical property of parts of a skeleton relate to their functions • Explain antagonistic pairs • Explain why some organs contain muscle tissue (stomach/heart)
Human and plant reproduction	<ul style="list-style-type: none"> • Compare the changes that happen during puberty in males and females • Describe the roles of the male and female parts of the reproductive system • Sequence images of the developing foetus • Explain how plants reproduce using sexual reproduction
Elements, compounds, mixtures and separation	<ul style="list-style-type: none"> • Explain the differences between elements, compounds and mixtures • Use particle diagrams to show substances as elements, compounds and mixtures • Use observations to determine if a substance is an element, compound or mixture • Name compounds formed from a ranger of elements • Write chemical formulas to show compounds • Explain how substances dissolve using particle models • Use the particle model to explain how filtration and evaporation works • Explain how chromatography works • Explain how distillation works • Produce a solubility curve
Forces (Contact and non-contact)	<ul style="list-style-type: none"> • Describe how multiple forces react on an object • Calculating resultant forces • Explain the effect of forces (stretching/squashing) • Explain why forces are useful or not (friction)

Interdependence, cycling materials, human impact on environment	<ul style="list-style-type: none">• Describe how organisms within an ecosystem are linked• Construct food webs• Explain the effects of changes on a food web and population
Climate and earth's resources	<ul style="list-style-type: none">• Explain why recycling some materials is particularly important• Explain methods to reduce carbon emissions• Evaluate claims about global warming using data

