



Curriculum Overview: Year 9 Science

What your child will learn each half term

This overview shows the key topics, skills, and knowledge your child will be learning in Year 9 in Science. It helps families understand what's being taught, how it builds on previous learning, and how you can support your child at home.

- **What we are learning:** The topic or focus for the half term.
- **Key knowledge & skills:** What students should understand and be able to do.
- **How we assess learning:** knowledge checks, practical tasks, written responses and formal assessments.
- **Key words to know:** Vocabulary students will learn and use.

Half term	What we are learning	Key knowledge/skills	How we will assess learning in this unit	Homework
HT1	Types of reactions Electricity Fundamentals	• Different types of chemical reactions: • The transformation of reactants into products • Energy changes in reactions • Planning and conducting chemical experiments • Measuring and recording changes such as temperature or gas production • Writing word and symbol equations, including balanced chemical equations • Classifying reactions and explaining observations using scientific vocabulary • Construct and identify working electrical circuits. • Use circuit symbols to draw and interpret circuit diagrams. • Describe the flow of electric current in a circuit. • Measure and explain voltage in simple circuits. • Compare series and parallel circuits. • Investigate how resistance affects current flow. • Explore the properties and uses of magnets and electromagnets. • Apply scientific knowledge to solve problems and identify faults in circuits. • Record and analyse results from practical investigations. • Develop practical and analytical scientific skills.	Multiple-choice knowledge checks will take place before, during and after each topic. These assessments help students develop and demonstrate their knowledge, understanding and application of scientific concepts. Results are used alongside a Personal Learning Checklist (PLC) to help students recognise their strengths and identify areas for further improvement. Extended writing task – a 6-mark question on a particular aspect of the topic. Requiring pupils to provide more detailed and structured responses, assessing a pupil's ability to organise their ideas clearly, apply scientific vocabulary accurately and encourage a deeper understanding. An end of unit feedback task – composed of a variety of tasks. Assessing pupils understanding of key concepts and skills covered throughout the topic; testing both recall and application of scientific knowledge. Helping to identify strengths and topics that may need further reinforcement or focus for pupils.	Homework is set weekly through the online platform Educake. Tasks reinforce current learning and revisit previous topics to support long-term retention of key scientific knowledge. Homework includes a mixture of multiple-choice and extended response questions. Teachers monitor completion and provide feedback where appropriate. Parents will be contacted if there are ongoing concerns regarding the completion of homework.
Key Vocabulary Types of Reactions Reaction Reactants Products Exothermic Endothermic Combustion Oxidation Neutralisation Energy transfer Temperature Electricity Fundamentals Circuit Current Voltage Resistance Cell Battery Series circuit Parallel circuit Ammeter Voltmeter				

HT2	Inheritance and variation Microbes	Inheritance and variation - Genes, alleles, and DNA - Dominant and recessive inheritance - Genetic variation and mutations - How inheritance affects physical traits - The role of variation in evolution - Interpreting genetic diagrams such as Punnett squares - Predicting inheritance patterns - Analysing genetic data to understand patterns of variation and heritability Microbes - Types of microbes - How microbes cause disease - How the immune system defends the body - The use of antibiotics, vaccines, and hygiene to prevent and treat infections - Investigating microbial growth and spread - Analysing infection rate data - Evaluating the effectiveness of antibiotics and vaccines	Multiple choice knowledge check Extended writing task An end of unit feedback task	Homework is set weekly via Educake and is designed to reinforce current learning while revisiting prior topics to support long-term retention. Tasks include a range of question types, with completion monitored by teachers. Parents will be contacted if there are ongoing concerns about homework completion.
Key Vocabulary Inheritance and Variation Variation Gene Allele DNA Chromosome Dominant Recessive Genotype Phenotype Characteristic Microbes and Disease Bacteria Virus Fungus Protozoa Pathogen Vaccine Contagious Contamination Infection Immunity				

HT3	Forces and pressure Evolution	Forces and pressure - Describe the effects of forces on objects. - Explain the difference between balanced and unbalanced forces. - Investigate how forces affect movement. - Understand how pressure is created and measured. - Explain pressure in solids, liquids and gases. - Explore how pressure affects everyday objects and situations. - Use simple calculations involving force and pressure. - Interpret data and identify patterns in results. - Record observations accurately during practical investigations. - Develop practical and analytical scientific skills. Evolution - Understand how species change over time through natural selection. - Recognise the evidence for evolution, including fossils and genetics. - Explain how adaptations help organisms survive in their environment. - Understand how variation occurs within populations. - Appreciate the development of scientific ideas about evolution over time.	Multiple choice knowledge check Extended writing task An end of unit feedback task	Homework is set weekly via Educake and is designed to reinforce current learning while revisiting prior topics to support long-term retention. Tasks include a range of question types, with completion monitored by teachers. Parents will be contacted if there are ongoing concerns about homework completion.
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Key Vocabulary

Forces and pressure

Force, Pressure, Balanced, Unbalanced, Gravity, Friction, Air resistance, Surface area, Mass, Newton

Evolution

Natural selection | Adaptation | Variation | Inheritance | Species | Fossil | Genetics | Mutation | Survival of the fittest | Evidence

HT4	Big ideas Units – Our 'Big Ideas' units revisit and strengthen some of the most important scientific concepts and skills. They help students build secure foundations, address misconceptions and prepare confidently for the transition to GCSE Science.	Big Ideas: Working Scientifically - Develops the practical, mathematical and investigative skills needed to think and work like a scientist throughout KS3 and GCSE Science. Big Ideas: Matter - Revisits the key ideas about particles, changes of state, density and separating mixtures to strengthen understanding and prepare students for GCSE Science. Big Ideas: Energy - Consolidates the core ideas of energy stores, transfers and efficiency, building the foundations needed for future physics topics and GCSE Science.	Multiple choice knowledge check Extended writing task An end of unit feedback task	Homework is set weekly via Educake and is designed to reinforce current learning while revisiting prior topics to support long-term retention. Tasks include a range of question types, with completion monitored by teachers. Parents will be contacted if there are ongoing concerns about homework completion.
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Key Vocabulary

Big Ideas: Working Scientifically

Observation | Hypothesis | Variable | Investigation | Evidence | Conclusion | Accuracy | Precision | Reliability | Evaluation

Big Ideas: Matter

Particle | State | Solid | Liquid | Gas | Diffusion | Density | Mixture | Separation | Energy

Big Ideas: Energy

Energy | Store | Transfer | Conservation | Efficiency | Thermal | Kinetic | Chemical | Gravitational | Elastic

HT 5	Big ideas unit Our 'Big Ideas' units revisit and strengthen some of the most important scientific concepts and skills. They help students build secure foundations, address misconceptions and prepare confidently for the transition to GCSE Science. Bridging units Revisits and strengthens important Key Stage 3 knowledge while introducing the scientific concepts, vocabulary and skills that students will build on throughout Key Stage 4. This helps ensure a smooth transition into GCSE Science.	Big Ideas: Working Scientifically – see details in Ht4 Big Ideas: Matter – see details in HT4 Big Ideas: Energy - see details in HT4 Bridging Unit: B1a – Cells - Describe the structure and function of animal and plant cells. - Explain how specialised cells are adapted for their function. - Explain diffusion, osmosis and active transport. - Use microscopes and interpret cell images. - Apply knowledge to explain biological processes. Bridging Unit: C1a – Atomic Structure and the Periodic Table - Describe the structure of the atom. - Explain the difference between elements, compounds and mixtures. - Use the periodic table to identify patterns and properties. - Use chemical symbols and formulae accurately. - Apply knowledge to explain simple chemical reactions. Bridging Unit: P1b – Heat Transfer - Explain conduction, convection and radiation. - Use the particle model to explain heat transfer. - Compare thermal conductors and insulators. - Interpret diagrams and practical investigations. - Apply knowledge of heat transfer to everyday situations.	Multiple choice knowledge check Extended writing task An end of unit feedback task	Homework is set weekly via Educake and is designed to reinforce current learning while revisiting prior topics to support long-term retention. Tasks include a range of question types, with completion monitored by teachers. Parents will be contacted if there are ongoing concerns about homework completion.
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Key Vocabulary

Big Ideas: Working Scientifically - Observation | Hypothesis | Variable | Investigation | Evidence | Conclusion | Accuracy | Precision | Reliability | Evaluation

Big Ideas: Matter - Particle | State | Solid | Liquid | Gas | Diffusion | Density | Mixture | Separation | Energy

Big Ideas: Energy - Energy | Store | Transfer | Conservation | Efficiency | Thermal | Kinetic | Chemical | Gravitational | Elastic

Bridging Unit: B1a - Cell | Specialised cell | Diffusion | Osmosis | Active transport | Microscope | Tissue | Organ | Organ system | Magnification

Bridging Unit: C1a - Atom | Element | Compound | Mixture | Periodic table | Proton | Neutron | Electron | Chemical reaction | Equation

Bridging Unit: P1b (Heat Transfer) - Temperature | Heat | Thermal energy | Conduction | Convection | Radiation | Conductor | Insulator | Particle | Energy transfer

HT 6	Bridging units Ecology	Bridging Unit: B1a – Cells – See details in HT5 Bridging Unit: C1a – Atomic Structure and the Periodic Table. – See details in HT5 Bridging Unit: P1b – Heat Transfer – See details in HT5 Ecology • Understand how energy is transferred through food chains and food webs. • Identify producers, consumers, predators and prey. • Explain the relationships between organisms within an ecosystem. • Describe how organisms depend on one another for survival. • Explore how competition affects plants and animals. • Understand how adaptations help organisms survive in their environment. • Investigate how changes in one population can affect others. • Describe the role of ecosystems, habitats and communities. • Use sampling techniques to investigate populations in an ecosystem. • Develop practical, observational and analytical scientific skills.	Multiple choice knowledge check Extended writing task An end of unit feedback task	Homework is set weekly via Educake and is designed to reinforce current learning while revisiting prior topics to support long-term retention. Tasks include a range of question types, with completion monitored by teachers. Parents will be contacted if there are ongoing concerns about homework completion.
Key Vocabulary Bridging Unit: B1a - Cell Specialised cell Diffusion Osmosis Active transport Microscope Tissue Organ Organ system Magnification Bridging Unit: C1a - Atom Element Compound Mixture Periodic table Proton Neutron Electron Chemical reaction Equation Bridging Unit: P1b (Heat Transfer) - Temperature Heat Thermal energy Conduction Convection Radiation Conductor Insulator Particle Energy transfer Ecology - Food chain, Food web, Producer, Consumer, Predator, Prey, Ecosystem, Habitat, Competition, Adaptation				