



Year 10 Science

Achievement

By the end of Year 10 students explain the processes that underpin heredity and genetic diversity and describe the evidence supporting the theory of evolution by natural selection. They sequence key events in the origin and evolution of the universe and describe the supporting evidence for the big bang theory. They describe trends in patterns of global climate change and identify causal factors. They explain how Newton's laws describe motion and apply them to predict motion of objects in a system. They explain patterns and trends in the periodic table and predict the products of reactions and the effect of changing reactant and reaction conditions. Students analyse the importance of publication and peer review in the development of scientific knowledge and analyse the relationship between science, technologies and engineering. They analyse the key factors that influence interactions between science and society.

Students plan and conduct safe, valid and reproducible investigations to test relationships or develop explanatory models. They explain how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data. They select equipment and use it efficiently to generate and record appropriate sample sizes and replicable data with precision. They select and construct effective representations to organise, process and summarise data and information. They analyse and connect a variety of data and information to identify and explain patterns, trends, relationships and anomalies. They evaluate the validity and reproducibility of methods, and the validity of conclusions and claims. They construct logical arguments based on analysis of a variety of evidence to support conclusions and evaluate claims. They select and use content, language and text features effectively to achieve their purpose when communicating their ideas, findings and arguments to diverse audiences.

Assessment Criteria

An overall level of achievement in this subject is determined by the teacher's on-balance judgment of the evidence presented in students' summative assessment across the following:

- **Science Understanding** Biological Sciences, Chemical Sciences, Earth and Space Sciences, Physical Sciences.
- **Science as a Human Endeavour** Nature and development of science, Use and influence of science.
- **Science Inquiry Skills** Questioning and predicting, Planning and conducting, Processing and analysing data and information, Evaluating, Communicating.

Delivery (mode, time requirements, lessons)

Students have access to scheduled lessons each week. Lessons are delivered via Microsoft Teams. Students are also expected to undertake independent study to complete tasks and assessment in accordance with the Work Rate Calendar. Course materials can be accessed in QLearn.

Student Requirements

Computer, access to internet, email, printer, scanner, headset with microphone, exercise book, stationery and the science kit.

Year 10 Science (Semester 1)

		Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of summative assessment
Semester 1	Term 1	<p>Physics In this unit, students explore and apply Newton's three laws of motion to predict, describe and calculate the effect of forces on the motion of objects. They plan and conduct a range of investigations, involving formulation of hypotheses, assessment of risks and selection and use of appropriate methods. Students will draw conclusions using their knowledge of Newton's three laws of motion, identify sources of uncertainty and describe ways to alter experimental methods to improve data quality.</p>
		<p>Space Science: The universe In this unit, students explore features of the universe and how the Big Bang theory is used to explain the formation of the universe. They will consider how theories have changed over time in line with technological advances and are continuing to be refined. They will see how secondary data is analysed to describe astronomical phenomena.</p>
		<p>Summative assessment, criteria assessed, approximate timing/due date:</p> <ul style="list-style-type: none"> • Multimodal presentation on the Big Bang Theory. Week 4 • Student Experiment on inclined planes. Week 9
	Term 2	<p>Chemistry Students will identify patterns in atomic structure that allow prediction of the products of chemical reactions and are reflected by the Periodic Table. They use scientific knowledge of an atom's electron arrangement to predict the formation of ions and make predictions and draw conclusions from experimental data about the products of chemical reactions. Students will examine how scientific understanding of the atomic model has been refined over time and explain the role of technology in advancing this model.</p> <p>Students will explore the factors that affect reaction rates through observation and experimentation. They will plan, conduct, evaluate and report upon an investigation into the reaction rate of a chemical process. Students will consider how the development of useful products and chemical processes such as polymers and pharmaceuticals have been driven by societal needs, and the impact this has had on society and the environment.</p>
		<p>Summative assessment, criteria assessed, approximate timing/due date:</p> <ul style="list-style-type: none"> • Online Exam; Data Test. Week 9

Year 10 Science (Semester 2)

		Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of summative assessment
Semester 2	Term 3	<p>Biology Students will explore genetics and heredity. They will examine the differences between DNA, genes and the physical characteristics of an organism. Students will analyse monohybrid crosses and use patterns and trends to predict genotypes and phenotypes of offspring. They will investigate DNA and explore genetic diseases. Students will track heritable conditions on pedigrees and debate the ethical issues surrounding genetic testing. They will analyse monohybrid multi-generation crosses and predict the genotypes and phenotypes of offspring.</p> <p>Students develop an understanding of how the diversity of life on Earth can be explained by the theory of evolution by natural selection. Students will review models and mechanisms that have been developed and refined over time by a range of scientists to explain evolution and evaluate the evidence that supports these. They will assess representations of how the Earth's biological diversity has branched out from a single origin and consider how technology and scientific knowledge has affected scientific research and people's lives through genetically modified foods. Students will critically analyse the validity of evolutionary evidence found in secondary sources and communicate their understanding of the theories and processes of evolution using scientific language, conventions and representations.</p>
		<p>Summative assessment, criteria assessed, approximate timing/due date:</p> <ul style="list-style-type: none"> • Research Investigation. Week 9
	Term 4	<p>Earth Science: Global systems In this unit students will explore how the Earth is composed of four interacting and dynamic spheres within which the global systems and cycles operate. They will consider how matter cycles within and between these spheres, such as the carbon cycle, and use scientific knowledge to evaluate how humans have influenced these systems. Students will analyse and evaluate datasets on carbon emissions, the link with climate change and the impact of climate change on society.</p>
		<p>Summative assessment, criteria assessed, approximate timing/due date:</p> <ul style="list-style-type: none"> • Data Test; Multimodal presentation. Week 8

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