

Year 9 Syllabus

Year Level Description

The science inquiry skills and science as a human endeavour strands are described across a two-year band. In their planning, schools and teachers refer to the expectations outlined in the achievement standard and also to the content of the science understanding strand for the relevant year level to ensure that these two strands are addressed over the two-year period. The three strands of the curriculum are interrelated and their content is taught in an integrated way. The order and detail in which the content descriptions are organised into teaching and learning programs are decisions to be made by the teacher.

Incorporating the key ideas of science

Over Years 7 to 10, students develop their understanding of microscopic and atomic structures, how systems at a range of scales are shaped by flows of energy and matter and interactions due to forces, and develop the ability to quantify changes and relative amounts.

In Year 9, students consider the operation of systems at a range of scales. They explore ways in which the human body as a system responds to its external environment and the interdependencies between biotic and abiotic components of ecosystems. They are introduced to the notion of the atom as a system of protons, electrons and neutrons, and how this system can change through nuclear decay. They learn that matter can be rearranged through chemical change and that these changes play an important role in many systems. They are introduced to the concept of the conservation of matter and begin to develop a more sophisticated view of energy transfer. They begin to apply their understanding of energy and forces to global systems such as continental movement.

Science Understanding

BIOLOGICAL SCIENCES

Multi-cellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment ([ACSSU175](#))

Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems ([ACSSU176](#))

CHEMICAL SCIENCES

All [matter](#) is made of atoms that are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of

Science as a Human Endeavour

NATURE AND DEVELOPMENT OF SCIENCE

Scientific understanding, including models and theories, is contestable and is refined over time through a process of review by the scientific community ([ACSHE157](#))

 Ethical understanding

Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries ([ACSHE158](#))


USE AND INFLUENCE OF SCIENCE

Science Inquiry Skills

QUESTIONING AND PREDICTING

Formulate questions or hypotheses that can be investigated scientifically ([AC SIS164](#))

 Literacy

 Critical and creative thinking

PLANNING AND CONDUCTING

Plan, select and use appropriate investigation types, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods ([AC SIS165](#))

 Literacy

 Critical and creative

nuclei in atoms

[\(ACSSU177\)](#)

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed

[\(ACSSU178\)](#)

Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer

[\(ACSSU179\)](#)

EARTH AND SPACE SCIENCES

The theory of plate tectonics explains global patterns of geological activity and continental movement

[\(ACSSU180\)](#)

 Numeracy

PHYSICAL SCIENCES

People use scientific knowledge to evaluate whether they accept claims, explanations or predictions, and advances in science can affect people's lives, including generating new career opportunities

[\(ACSHE160\)](#)

Values and needs of contemporary society can influence the focus of scientific research

[\(ACSHE228\)](#)

 Ethical understanding

thinking


 Ethical understanding

Select and use appropriate equipment, including digital technologies, to collect and record data systematically and accurately

[\(AC SIS166\)](#)

 Literacy

 Numeracy

 Information and Communication Technology (ICT) capability

PROCESSING AND ANALYSING DATA AND INFORMATION

Analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies


[\(AC SIS169\)](#)

Energy transfer through different mediums can be explained using wave and particle models

[\(ACSSU182\)](#)


 Literacy

 Numeracy

 Critical and creative thinking

Use knowledge of scientific concepts to draw conclusions that are consistent with evidence [\(AC SIS170\)](#)

 Literacy

 Critical and creative thinking

EVALUATING

Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data [\(AC SIS171\)](#)

 Literacy


 Numeracy

 Critical and creative

thinking

Critically analyse the validity of information in primary and secondary sources and evaluate the approaches used to solve problems
[\(AC SIS172\)](#)


 Literacy

 Critical and creative thinking

COMMUNICATING

Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations
[\(AC SIS174\)](#)

 Literacy

 Critical and creative thinking

Year 9 Achievement Standard

Science Understanding

At Standard, students explain chemical processes and natural radioactivity in terms of atoms and energy transfers and describe examples of important chemical reactions. They describe wave and particle models of energy transfer and apply these to explain phenomena. Students explain global features and events in terms of geological processes and timescales. They analyse how biological systems function and respond to external changes and describe ecosystems with reference to interdependencies, energy transfers and flows of matter.

Science as a Human Endeavour

Students describe social and technological factors that have influenced scientific developments.

Science Inquiry Skills

Students design questions that can be investigated. They design methods that include the control and measurement of variables and systematic collection of data and describe how they considered ethics and safety. Students analyse trends in data, identify relationships between variables and inconsistencies in results. They analyse their methods and the quality of their data, and suggest actions to improve the quality of their evidence. Students evaluate others' methods and explanations from a scientific perspective and use appropriate language and representations when communicating their findings and ideas.

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