Government of **Western Australia**
School Curriculum and Standards Authority

SCIENCE IN PRACTICE

General course

Year 11 syllabus for teaching from 2027

Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

Important information

As part of the Western Australian Certificate of Education (WACE) Refreshment, the School Curriculum and Standards Authority (the Authority) has revised the course rationale and aims, and updated the General Capabilities to create clearer connections with the syllabus content.

This syllabus is effective from 1 January 2027.

Users of this syllabus are responsible for checking its currency.

Syllabuses are formally reviewed by the Authority on a cyclical basis, typically every five years.

Contents

Rationale

The Science in Practice General course develops students' awareness and understanding of science beyond the classroom through authentic, real-world experiences. Students investigate science issues in the context of the world around them and contribute to discussions related to science issues in the community.

The course is grounded in the belief that science is, in essence, a practical activity. Students explore, experience and learn concepts and practical skills valued in multidisciplinary science, workplaces and other settings. They are encouraged to be reflective and critical thinkers about scientific issues, enabling them to make informed decisions about questions that directly affect their lives and the lives of others.

Science in Practice is founded on knowledge and understanding that has been gained through systematic inquiry, scientific research and practical application. Workplace health and safety practices are embedded and focus on building knowledge and skills in working safely, effectively and efficiently in practical, workplace and real-life situations. Students develop scientific literacy along with a deep understanding of the subject. They are challenged to ask questions and draw evidence-based conclusions using scientific knowledge and practices. Students develop the knowledge and skills to think critically, evaluate evidence, solve problems, and communicate understandings in scientific ways.

Students develop knowledge, skills and understandings that they can apply in real-world contexts. They gain a deeper understanding not only of a particular topic or context but also of the link between theory and practice in the real world. With an understanding of science, students are able to make better life decisions, and to be more informed contributors to discussions related to science issues in the community.

The course builds students' understanding of expectations for work in scientific settings and prepares them for further study and career pathways in scientific settings. The course gives students a grounding in scientific literacy that prepares them to make evidence-based decisions and contributions in the community.

Aims

The Science in Practice General course aims to develop students':

- use of the scientific method for a variety of investigations to demonstrate understanding of the natural and technological world
- application of workplace health and safety requirements and practices while working in the laboratory or the field
- ability to ask questions and draw evidence-based conclusions using scientific knowledge and practices
- use of appropriate terms, conventions and representations to demonstrate understanding of
- context-specific scientific concepts
- application of knowledge to solve problems and make informed decisions that impact on themselves and society
- use of appropriate representations, multimodal mechanisms and platforms to communicate scientific understandings.

Organisation

This course is organised into a Year 11 syllabus and a Year 12 syllabus. The concepts, ideas and associated skills in the course are similar for each unit; however, the cognitive complexity of the syllabus content should increase from Year 11 to Year 12.

Structure of the syllabus

The syllabus is divided into two units, each of one semester duration. Each unit should integrate at least two of the science disciplines – Biology, Chemistry, Earth Science and Physics, with a minimum of three different science disciplines integrated into the pair of units.

Each unit could be taught in different contexts or one context could be taught over the year. Contexts covered in Year 11 may be studied again in Year 12 as long as the context specific content being covered is different and the cognitive complexity of the syllabus content has increased.

For example

1. Two units on different themes
   - Each unit integrates two science disciplines, and four different science disciplines are integrated into the pair of units

Unit 1 Wheels in motion (Biology and Physics)	**Unit 2** Local geology (Chemistry and Earth Science)

2. Two units on the same theme in different contexts
   - Each unit integrates two science disciplines, and three different science disciplines are integrated into the pair of units

Unit 1 Agricultural Science (Chemistry and Earth Science)	**Unit 2** Agricultural Science (Biology and Chemistry)

3. Two units taught concurrently in the same context
   - Three different science disciplines are integrated into the pair of units

Unit 1 and 2 Forensic Science (Biology, Chemistry and Physics)

The notional time for each unit is 55 class contact hours.

Authority-approved units

Only Authority-approved units can be delivered.

A list of Authority-approved units is published on the Science in Practice General course page at https://senior-secondary.scsa.wa.edu.au/syllabus-and-support-materials/science/science-in-practice. Access to these units and the associated support materials requires teachers to login or register for an Extranet account https://www.scsa.wa.edu.au/extranet/login.

Schools may develop their own units or modify approved units; however, these will need to be approved by the Authority prior to the commencement of teaching. The process for unit approval is available on the Science in Practice General course page on the Authority website.

Organisation of content

Science content areas

The course content is divided into four content areas:

- Scientific Method
- Workplace Health and Safety
- Scientific Literacy
- Science Understanding.

These content areas should be taught in an integrated way. The organisation of the content areas provides an opportunity to integrate content in flexible and meaningful ways.

Scientific Method

The Scientific Method involves asking questions about the natural and technological world, preparing a plan to collect, process and interpret data, making conclusions, and evaluating procedures and findings.

Workplace Health and Safety

Knowledge of safety rules and safe working procedures is important to reduce the risk of potential incidents and injuries when participating in science activities.

Scientific Literacy

Informed participation in society requires knowledge of the relevant science concepts, skills and practice, consideration of ethical implications of science and technological research, and communicate knowledge and findings effectively to appropriate audiences.

Science Understanding

Science Understanding is evident when a person selects and integrates appropriate science concepts, models and theories to explain and predict phenomena, and applies these to unfamiliar situations.

The Science Understanding content in each unit develops students' understanding of the key concepts, models and theories that underpin the context being studied.

Safety

Science learning experiences may involve the use of potentially hazardous substances and/or hazardous equipment. It is the responsibility of the school to ensure that duty of care is exercised in relation to the health and safety of all students and that school practices meet the requirements of the *Work Health and Safety Act 2011* (Cth), in addition to relevant state or territory health and safety guidelines.

Animal ethics

Through a consideration of research ethics as part of Science Inquiry Skills, students will examine their own ethical position, draw on ethical perspectives when designing investigation methods, and ensure that any activities that impact on living organisms comply with the *Australian code of practice for the care and use of animals for scientific purposes* (www.nhmrc.gov.au).

Any teaching activities that involve the care and use of, or interaction with, animals must comply with the *Australian code of practice for the care and use of animals for scientific purposes*, in addition to relevant State guidelines.

Mathematical skills expected of students studying the Science in Practice General course

The Science in Practice General course requires students to use the mathematical skills they have developed through the Years 7–10 Mathematics curriculum, in addition to the numeracy skills they have developed through the Science Inquiry strand of the Years 7–10 Science curriculum.

The scientific method content requires students to gather, represent and analyse numerical data to identify the evidence that forms the basis of scientific arguments, claims or conclusions. In gathering and recording numerical data, students are required to take measurements using appropriate units to an appropriate degree of accuracy.

It is assumed that students will be able to competently:

- perform calculations involving addition, subtraction, multiplication and division of quantities
- perform approximate evaluations of numerical expressions
- express fractions as percentages, and percentages as fractions
- calculate percentages
- recognise and use ratios
- comprehend and use the symbols/notations <, >, Δ, ≈
- translate information between graphical, numerical and algebraic forms
- distinguish between discrete and continuous data and then select appropriate forms, variables and scales for constructing graphs
- construct and interpret frequency tables and diagrams, pie charts and histograms
- describe and compare data sets using mean, median and range
- interpret the slope of a linear graph.

Progression from the Years 7–10 curriculum

This syllabus continues to develop student understanding and skills from the Years 7–10 Science curriculum: Science Understanding and Science Inquiry.

Representation of the General Capabilities

The General Capabilities encompass the knowledge, skills, behaviours and dispositions that will support students to live and work successfully now and into the future. They are not assessed unless identified within the specified unit content. Teachers should find opportunities to incorporate the following General Capabilities into the teaching and learning program for the Science in Practice General course.

Critical and creative thinking

Critical and creative thinking is developed in the course as students use scientific method to construct, review and revise questions and hypotheses and design related investigation methods. Science is a creative endeavour and students devise innovative solutions to problems, predict possibilities, envisage consequences and speculate on possible outcomes as they develop their skills and understanding of the course content. When conducting research, constructing scientific arguments, and drawing and justifying conclusions, students use critical thinking skills to consider the accuracy, validity and relevance of information and opinions. They interpret and evaluate data, interrogate and select evidence, and analyse processes, interpretations, conclusions and claims for validity and reliability, including reflecting on their own processes and conclusions.

Digital literacy

Digital literacy is developed in the course as students use a range of strategies to locate, access and evaluate information from multiple digital sources; to collect, analyse and represent data; to model and interpret concepts and relationships; and to communicate and share science ideas, processes and information.

Literacy

Literacy is developed in the course as students refine their skills and understandings related to the four content areas of the course: Scientific Method, Workplace Health and Safety, Scientific Literacy and Science Understanding. Students work in groups to plan and conduct investigations. They gather, interpret, synthesise and critically analyse information presented in a wide range of genres, modes and representations, including text, flow diagrams, symbols, graphs and tables. They evaluate information sources and compare and contrast ideas, information and opinions presented within and between texts. They communicate processes and ideas logically and fluently, both orally and in writing. They construct evidence-based arguments, selecting genres and employing appropriate structures and features to communicate for specific purposes and audiences.

Numeracy

Students develop their numeracy in the course as they apply the wide range of skills associated with the Scientific Method content, including making and recording observations; ordering, representing and analysing data; and interpreting trends and relationships. They employ numeracy skills to interpret complex representations, and to appreciate the ways in which biological and physical systems are structured, interact and change. They engage in analysis of data, including issues relating to accuracy, reliability and probability, and they interpret and manipulate mathematical relationships to calculate and predict values.

Addressing the other General Capabilities

Although the following General Capabilities have not been identified as a focus in the Science in Practice General Year 11 syllabus, teachers may find opportunities to incorporate them into the teaching and learning program.

- Ethical understanding
- Intercultural understanding
- Personal and social capability

Such opportunities may occur through the application of different contexts, pedagogical practices and/or assessment strategies that relate to the syllabus as part of the teaching and learning program.

Summary representation of the General Capabilities in the Science in Practice General course

The unit content and assessment types for this course provide students with the opportunity to develop the General Capabilities summarised in the table below.

Year	Course	Course type	General Capabilities						
			CCT	DL	EU	IU	N	L	PSC
Year 11	Science in Practice (GESIP)	General	✓	✓			✓	✓	
Year 12	Science in Practice (GTSIP)	General	✓	✓			✓	✓	

Key
CCT: Critical and creative thinking, DL: Digital literacy, EU: Ethical understanding, IU: Intercultural understanding, L: Literacy, N: Numeracy, PSC: Personal and social capability

Representation of the Cross-curriculum Priorities

The Cross-curriculum Priorities address contemporary issues that students face in a globalised world. Teachers may find opportunities to incorporate them into the teaching and learning program for the Science in Practice General course. The Cross-curriculum Priorities are not assessed unless they are identified within the specified unit content.

Aboriginal and Torres Strait Islander histories and cultures

Contexts that draw on Aboriginal and Torres Strait Islander histories and cultures provide opportunities for students to recognise the importance of Aboriginal and Torres Strait Islander Peoples' knowledge in developing a richer understanding of the Australian environment. Students could develop an appreciation of the unique Australian biota and its interactions, the impacts of Aboriginal and Torres Strait Islander Peoples on their environments and the ways in which the Australian landscape has changed over tens of thousands of years. They could examine the ways in which Aboriginal and Torres Strait Islander Peoples' knowledge of ecosystems has developed over time and the spiritual significance of Country/Place.

Asia and Australia's engagement with Asia

Contexts that draw on Asian scientific research and development and collaborative endeavours in the Asia Pacific region provide an opportunity for students to investigate Asia and Australia's engagement with Asia. Students could explore the diverse environments of the Asia region and develop an appreciation that interaction between human activity and these environments continues to influence the region, including Australia, and has significance for the rest of the world. By examining developments in science and technology, students could appreciate that the Asia region plays an important role in scientific research and development through collaboration with Australian scientists.

Sustainability

The Sustainability cross-curriculum priority could provide authentic contexts for exploring, investigating and understanding the function and interactions of systems across a range of spatial and temporal scales. By investigating the relationships between systems and system components, and how systems respond to change, students develop an appreciation for the interconnectedness of the Earth system. Students appreciate that science provides the basis for decision making in many areas of society and that these decisions can impact on the Earth system. They understand the importance of using science to predict possible effects of human and other activity, and to develop plans, or alternative technologies, that minimise these effects and provide for a more sustainable future.

Units 1 and 2

Units should integrate concepts, ideas and associated skills from each content area and use a contextual approach that utilises learning experiences from aspects of at least two of the science disciplines – Biology, Chemistry, Earth Science and Physics, with a minimum of three different science disciplines integrated across the pair of units. Units of work developed through contexts enable students to identify science in their world and understand the importance of science in their lives.

Units of work should allow students to explore, investigate and model processes through practical activities. Students should also be encouraged to use information and communication technology to gather and interpret data, and communicate their findings in a variety of ways.

The context used to teach the syllabus content should engage students, have local real-life application, and be relevant to students' everyday life. The context should form a framework that enables students to actively engage in inquiry-based learning and further develop their understanding of scientific concepts.

Each unit could be taught in different contexts or one context could be taught over the year. Contexts covered in Year 11 may be studied again in Year 12 as long as the context-specific content being covered is different and the cognitive complexity of the syllabus content has increased.

Only Authority-approved units can be delivered. A list of Authority-approved units is published on the Science in Practice General course page at https://senior-secondary.scsa.wa.edu.au/syllabus-and-support-materials/science/science-in-practice. Schools may develop their own units or modify approved units; however, these will need to be approved by the Authority prior to the commencement of teaching.

Unit content

Each unit includes the knowledge, understandings and skills described below.

Scientific Method

- research a given topic and construct questions for investigation
- design scientific investigations, including the formulation of investigable questions and/or hypotheses, materials required, procedures to be followed to collect valid and reliable data, and identification of safety and ethical considerations
- use equipment and techniques safely, competently and methodically to collect valid and reliable data, and use equipment with precision, accuracy and consistency
- represent qualitative and quantitative data in meaningful and useful ways, including the construction of appropriately labelled tables, processing of quantitative data using appropriate mathematical techniques and units, and drawing of appropriate graphs
- analyse data to identify and describe patterns and relationships, and recognise errors and limitations in data
- draw conclusions consistent with the evidence and relevant to the question being investigated
- evaluate investigative procedures, including the relevance, accuracy, validity and reliability of data, and suggest improvements

Workplace Health and Safety

- use and apply workplace health and safety documents, including safety data sheets (SDS), and other relevant documents, such as standard operating procedures (SOP), when performing activities
- conduct risk assessments to identify potential hazards and prevent potential incidents and injuries

Scientific Literacy

- distinguish between opinion, anecdote and evidence, and scientific and non-scientific ideas
- identify examples of where the application of scientific knowledge may have beneficial and/or harmful and/or unintended consequences
- use scientific knowledge to develop and evaluate projected economic, social and environmental impacts and to design action for sustainability
- communicate information and ideas in a variety of ways using scientific conventions and terminology, including the selection and presentation of data and ideas to convey meaning to selected audiences in written, oral and multimedia formats

Science Understanding*

The Science understanding content is context specific. Students should be able to communicate knowledge and understanding of scientific concepts, using appropriate terms, conventions and representations.

* The science concepts, conventions and representations are context specific and should be specified for each unit as part of the unit-development process for approval.

Assessment

Assessment is an integral part of teaching and learning that at the senior secondary years:

- provides evidence of student achievement
- identifies opportunities for further learning
- connects to the standards described for the course
- contributes to the recognition of student achievement.

Assessment for learning (formative) and assessment of learning (summative) enable teachers to gather evidence to support students and make judgements about student achievement. These are not necessarily discrete approaches and may be used individually or together, and formally or informally.

Formative assessment involves a range of informal and formal assessment procedures used by teachers during the learning process in order to improve student achievement and to guide teaching and learning activities. It often involves qualitative feedback (rather than scores) for both students and teachers, which focuses on the details of specific knowledge and skills that are being learnt.

Summative assessment involves assessment procedures that aim to determine students' learning at a particular time, for example when reporting against the standards, after completion of a unit/s. These assessments should be limited in number and made clear to students through the assessment outline.

Appropriate assessment of student work in this course is underpinned by reference to the set of pre-determined course standards. These standards describe the level of achievement required to achieve each grade, from A to E. Teachers use these standards to determine how well a student has demonstrated their learning.

Where relevant, higher order cognitive skills (e.g. application, analysis, evaluation and synthesis) and the General Capabilities should be included in the assessment of student achievement in this course. All assessment should be consistent with the requirements identified in the course assessment table.

Assessment should not generate workload and/or stress that, under fair and reasonable circumstances, would unduly diminish the performance of students.

School-based assessment

The *Western Australian Certificate of Education (WACE) Manual* contains essential information on principles, policies and procedures for school-based assessment that must be read in conjunction with this syllabus.

School-based assessment involves teachers gathering, describing and quantifying information about student achievement.

Teachers design school-based assessment tasks to meet the needs of students. As outlined in the *WACE Manual*, school-based assessment of student achievement in this course must be based on the Principles of Assessment:

- Assessment is an integral part of teaching and learning
- Assessment should be educative
- Assessment should be fair
- Assessment should be designed to meet its specific purpose/s
- Assessment should lead to informative reporting
- Assessment should lead to school-wide evaluation processes
- Assessment should provide significant data for improvement of teaching practices.

The *Western Australian Certificate of Education (WACE) Manual* contains essential information on principles, policies and procedures for school-based assessment that needs to be read in conjunction with this syllabus.

The table below provides details of the assessment types and their weighting for the Science in Practice General Year 11 syllabus.

Summative assessments in this course must:

- be limited in number to eight tasks
- allow for the assessment of each assessment type at least once over the year/pair of units
- have a minimum value of 5 per cent of the total school assessment mark
- provide a representative sampling of the syllabus content.

Assessment tasks not administered under test or controlled conditions require appropriate authentication processes.

Assessment table – Year 11

Type of assessment	Weighting
Investigation (minimum of 10 hours in class per unit) One investigation should be conducted in each unit and each investigation should have equal weighting. An investigation follows the scientific method, where students modify one or more practical activities in order to investigate a specific question through the collection and analysis of primary data. Students work individually or in groups to plan and conduct the investigation. Each student will prepare a written report to communicate their findings. Planning, working safely and group contributions could be monitored via student logbooks/journals, responses to reflection questions, teacher observations and/or peer assessment.	40%
Project (minimum of 5 hours in class per unit) One project should be conducted in each unit and each project should have equal weighting. A project involves students selecting and exploring a recent discovery, innovation or issue related to the context they are studying. Students are required to analyse and synthesise information from a variety of sources to explain the relevant scientific concepts involved, and describe its impact and/or influence on society. Students will communicate their findings to selected audiences in written, oral and/or multimedia formats (e.g. a scientific article, infographic, animation or vlog).	30%
Practical assessment (maximum of 1 hour in class per unit) One practical assessment should be conducted in each unit and each practical assessment should have equal weighting. Practical work helps develop technical and scientific skills, and improves scientific understanding. A practical assessment enables students to demonstrate their skills in the use of apparatus to collect data and model science concepts relevant to the context they are studying. Students will demonstrate their ability to work safely, manipulate apparatus and take accurate readings. Students may also demonstrate their ability to process and analyse data.	10%
Supervised written assessment (maximum of 1 hour in class per unit) One supervised written assessment should be conducted in each unit and each supervised written assessment should have equal weighting. A supervised written assessment contains one or more items. The items might be in response to stimulus materials, which may be seen or unseen, or questions which should be unseen prior to the administration of the assessment. Items may include: • Short answer questions requiring students to provide single word, sentence or short paragraph responses; construct, use, interpret or analyse secondary data, graphs, tables or diagrams; and/or perform mathematical calculations. • Extended answer questions requiring students to provide responses making connections, drawing conclusions, constructing arguments, analysing and/or evaluating information. The responses may incorporate labelled diagrams or tables with explanatory notes.	20%

Teachers must use the assessment table to develop an assessment outline for the pair of units (or for a single unit where only one is being studied).

The assessment outline must:

- include a set of assessment tasks
- include a general description of each task
- indicate the unit content to be assessed
- indicate a weighting for each task and each assessment type
- include the approximate timing of each task (for example, the week the task is conducted, or the issue and submission dates for an extended task).

Reporting

Schools report student achievement, underpinned by a set of pre-determined standards, using the following grades:

Grade	Interpretation
A	Excellent achievement
B	High achievement
C	Satisfactory achievement
D	Limited achievement
E	Very low achievement

The grade descriptions for the Science in Practice General Year 11 syllabus are provided in Appendix 1. They are used to support the allocation of a grade. They can also be accessed, together with annotated work samples, on the course page of the Authority website at www.scsa.wa.edu.au.

To be assigned a grade, a student must have had the opportunity to complete the education program, including the assessment program (unless the school accepts that there are exceptional and justifiable circumstances).

Refer to the *WACE Manual* for further information about the use of a ranked list in the process of assigning grades.

The grade is determined by reference to the standard, not allocated on the basis of a pre-determined range of marks (cut-offs).

Appendix 1 – Grade descriptions Year 11

A	**Scientific method** • Proposes investigable questions and hypotheses. • Constructs sequential and reproducible procedures to collect valid and reliable data. • Uses equipment and techniques safely and accurately to collect valid and reliable data. • Organises data logically and presents it in a range of forms using correct conventions, including appropriate graphs and tables, to show patterns and relationships. • Solves calculations and expresses answers using correct units. • Analyses data to describe patterns and relationships and recognises any errors and/or inconsistencies in data. • Links and explains patterns and relationships using relevant science understanding. • States and justifies conclusions consistent with the data and identifies whether conclusions support the hypothesis and/or answers the question being investigated. • Describes the validity and reliability of procedures, identifies inconsistences in data, and suggests relevant improvements to the design of the investigation.
	Workplace health and safety • Develops and follows risk assessments based on the hazard, risk and management strategy.
	Scientific literacy • Contrasts scientific and non-scientific ideas. • Presents scientific evidence to explain impacts and claims. • Communicates information and concepts logically, using correct scientific language, conventions and representations.
	Science understanding • Explains relationships between structures, systems and processes, using supporting examples.

B	**Scientific method** • Proposes investigable questions and hypotheses. • Constructs sequential procedures, that lack some detail, to collect valid and reliable data. • Uses equipment and techniques safely and accurately to collect data, most of the time. • Organises data logically and presents it in a range of forms using most conventions correctly, including appropriate graphs and tables, to show patterns and relationships. • Solves calculations and expresses answers using correct units, with only minor errors. • Analyses data to describe and briefly explain patterns and relationships and recognise any inconsistencies in data. • Links and briefly explains patterns and relationships using relevant science understanding. • States conclusions consistent with the data and identifies whether the conclusions support the hypothesis and/or answers the question being investigated. • States difficulties experienced in conducting the investigation or inconsistencies in data and suggests general improvements to the design of an investigation.
	Workplace health and safety • Develops and follows risk assessments that lack some detail.
	Scientific literacy • Contrasts scientific and non-scientific ideas. • Links scientific evidence to impacts and claims. • Communicates information and concepts using scientific language, conventions and representations.
	Science understanding • Describes structures, systems and processes, using supporting examples.

C	**Scientific method** • With guidance, proposes investigable questions and hypotheses that align with the investigation. • Constructs procedures that can be followed to collect appropriate data. • Uses equipment and techniques safely to collect data. • Presents data using tables and graphs. • Solves calculations with errors. • Describes patterns and relationships in data. • Attempts to explain patterns and relationships using science understanding. • States conclusions consistent with data. • States difficulties experienced in conducting the investigation or states general improvements.
	Workplace health and safety • Identifies and follows strategies to prevent incidents and injuries.
	Scientific literacy • Identifies scientific and non-scientific ideas. • Presents scientific evidence without linking to impacts and claims. • Communicates information and concepts using some scientific language and representations, making some errors in the use of conventions.
	Science understanding • Identifies and describes some structures, systems and processes.

D	**Scientific method** • Follows procedures to collect appropriate data. • Follows directions for the safe use of equipment and techniques. • With support, presents data using tables and graphs. • Performs calculations that contain many errors or are not attempted. • Incorrectly identifies, or overlooks, patterns and relationships. • Offers simple conclusions not supported by evidence. • States irrelevant suggestions to improve the investigation.
	Workplace health and safety • Follows provided strategies to prevent incidents and injuries.
	Scientific literacy • Incorrectly or inconsistently identifies scientific and non-scientific ideas. • Incorrectly or inconsistently presents scientific evidence. • Communicates information and concepts using everyday language and simple representations.
	Science understanding • Identifies some structures and systems.

E	Does not meet the requirements of a D grade and/or has completed insufficient assessment tasks to be assigned a higher grade.

* These grade descriptions will be reviewed at the end of the second year of implementation of this syllabus.

Appendix 2 – Glossary

This glossary is provided to enable a common understanding of the key terms in this syllabus.

accuracy
How close a measurement is to the true or acceptable value.

analyse
Consider in detail for the purpose of finding meaning or relationships, and identifying patterns, similarities and differences.

anecdote
A personal account of an event or incident to illustrate a point.

anomaly
Data point not consistent with the expected pattern or relationship.

argue
Make a case, based on appropriate evidence, for and/or against some given point of view.

argument
A claim justified with reference to evidence; scientific arguments are contestable.

claim
An assertion that something is true.

column graph
A graph for organising and displaying discrete data.

compare
Show how things are similar and different.

conclusion
A judgement based on evidence.

continuous data
Quantitative data with a potentially infinite number of possible values along a continuum.

contrast
Show how things are different or opposite.

control
The sample in the investigation that the other samples are compared to.

controlled variable
A variable that is kept constant (or changed in constant ways) during an investigation.

data
A general term for a set of observations or measurements collected during an investigation.

dependent variable
A variable that changes in response to changes to the independent variable in an investigation.

describe
Provide characteristics and features.

design
Plan and evaluate the construction of a product or process, including an investigation.

digital tools
Digital hardware, software, platforms and resources used to develop and communicate learning, ideas and information.

discrete data
Quantitative data consisting of a number of separate values where intermediate values are not permissible.

discuss
Talk over; identify issues and provide points for and/or against.

draw (conclusion)
Come to a conclusion based on evidence.

ethical
Principles, values and beliefs such as right, wrong, honesty, integrity, justice, equality, freedom, respect, truth, fairness, tolerance and loyalty.

evidence
Data that is considered reliable and valid, and that can be used to support a particular idea, conclusion or decision.

evaluate
Examine and judge the merit or significance of something, including processes, events, descriptions, relationships or data.

evidence
Data that is considered reliable and valid, and that can be used to support a particular idea, conclusion or decision.

explain
Relate cause and effect; make the relationships between things evident; provide why and/or how.

explanation
An account of a phenomenon through descriptive statements about how that phenomenon came to be.

extrapolate
Infer from what is known.

fair test
An investigation where one variable (the independent variable) is changed and all other conditions (the controlled variables) are kept the same; the dependent variable is what is measured or observed.

graph
A visual representation of the relationship between quantities plotted with reference to a set of axes.

hazard
Something that has the potential to do harm, such as boiling water splashing out of a beaker.

hypothesis
A tentative idea or explanation for an observation, which can be tested and either supported or refuted by investigation. For example, enzymes work best at 37 °C.

identify
Recognise and name.

illustrate
Similar to 'explain', but requires the quoting of specific examples or statistics, or possibly the drawing of maps, graphs, sketches etc.

impact
The influence or effect on a situation, community or person.

interpret
Draw meaning from.

independent variable
A variable that is changed in an investigation to see what effect it has on the dependent variable.

inference
An informed guess or logical conclusion based on previous experiences, observations and knowledge.

investigable question
A question that leads to a practical investigation through the collection of qualitative and/or quantitative data, such as 'How does temperature affect enzyme activity?'

investigation
A scientific process of answering a question, exploring an idea or solving a problem that requires activities such as planning, collecting and interpreting data and forming a conclusion.

justify
Support an argument or conclusion; give reasons for your statements or comments.

label
Identify by placing a name or word used to describe the object or thing.

line graph
A graph for organising and displaying continuous data, representing the relationship between two variables.

list
Provide a series of related words, names, numbers or items that are arranged one after the other.

model
A representation that describes, simplifies, clarifies or provides an explanation of the workings, structure or relationships within an object, system or idea.

modify
Alter; change the form or quality.

name
Provide a word or term used to identify an object, person, thing, place etc.

non-scientific ideas
Ideas formed from tradition, beliefs or personal experience.

observable
Something that can be seen, heard, felt, tasted or smelled either directly by an individual or indirectly by a measuring device, such as a ruler, camera or thermometer.

observation
A representation of something that has been seen, heard, felt, tasted or smelled either directly by an individual or indirectly by a measuring device, such as a ruler, camera or thermometer.

opinion
A personal view or judgement.

organise
Order or arrange systematically.

outlier
A data point that is far from other data points in a set of data.

outline
Sketch in general terms; indicate the main features of.

pattern
A repeated occurrence or sequence.

pose
Put forward a question for consideration or investigation.

precision
How close two or more measurements are to each other, regardless of whether those measurements are accurate.

prediction
A suggestion of what might happen based on observations. For example, if exercise increases, then heart rate will increase.

primary data
Data collected directly by a person or group.

primary source
Information created by a person or persons directly involved in a study or observing an event.

propose
Put forward for consideration or action, such as a point of view, idea, argument or suggestion.

qualitative data
Information that is not numerical in nature.

quantitative data
Numerical information.

reflect on
Think carefully about something, such as past experiences, activities or events.

relate
Identify connections or associations between ideas or relationships or between components of systems and structures.

relationship
A connection or association between ideas or between components of systems and structures.

reliability
The extent to which repeated observations and/or measurements taken under identical circumstances will yield similar results.

repeatable investigation
An investigation that produces the same results when repeated by the original researcher using the same method and equipment.

repeat trial
A test within an experimental investigation that is carried out more than once under the same set of conditions.

reliable data
Data that have been judged to have a high level of reliability.

replicable data
Data that are able to be reproduced exactly.

replicate
An independent experiment that uses the same method in order to validate findings.

represent
Method for presentation of data.

representation
The means by which science ideas and explanations are understood and communicated. Representations can take many different forms or modes.

reproducible investigation
An investigation that produces similar results when repeated by other researchers using the same method and equipment.

research
Locate, gather, record and analyse information in order to develop understanding.

risk
The chance that somebody could be harmed by the hazard.

risk assessment
The identification and prevention of possible hazards involved in experiments or other activities.

safety data sheet (SDS)
A document that provides critical information about hazardous chemicals. (Work Health and Safety Commission, n.d.)

scientific ideas
Ideas grounded in measurable and observable data gathered through observation or experimentation.

secondary data
Data collected by a person or group other than the person or group using the data.

secondary source
Information that has been compiled from primary sources by a person or persons not directly involved in the original study or event.

simulation
A representation of a process, event or system that imitates the real situation.

standard operating procedures (SOP)
Defined steps and processes required to undertake a given activity. (Department of Health, Disability and Ageing, 2021)

sustainable
Supports the needs of the present without compromising the ability of future generations to support their needs.

table
An arrangement of data or observations in rows and columns.

trend
General direction in which something is changing.

uncertainty
A situation in which something is not known or certain.

validity
The extent to which tests measure what was intended; the extent to which data, inferences and actions produced from tests and other processes are accurate.

variable (experimental)
A factor that can be changed, kept the same or measured in an investigation, such as time, distance, light or temperature.

Acknowledgements

Appendix 2 – Glossary

Safety Data Sheet	Work Health and Safety Commission. (n.d.). *Preparation of Safety Data Sheets for Hazardous Chemicals*. Retrieved June, 2026, from https://www.worksafe.wa.gov.au/safety-data-sheets-sds Used under a Creative Commons Attribution 4.0 International licence. © State of Western Australia (Department of Mines, Industry Regulation and Safety) 2022
Standard Operating Procedures	Department of Health, Disability and Ageing. (2021). *Standard Operating Procedure Template*. Retrieved June, 2026, from https://www.health.gov.au/resources/publications/standard-operating-procedure-template?language=en