

Science in Practice 2019

Study plan

Section 1: School statement

School:	Queensland Curriculum and Assessment Authority
Subject code:	6421
Combined class:	No
School contact:	SEO
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Section 2: Course and assessment overview

Science in Practice is a four-unit course of study.

Units 1 and 2 of the course are designed to allow students to begin their engagement with the course content, i.e. the knowledge, understanding and skills of the subject. Course content, learning experiences and assessment increase in complexity across the four units as students develop greater independence as learners.

Units 3 and 4 consolidate student learning.

QCAA approval

QCAA officer:	Date:
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Unit	Module number and description	Time in hours	Electives and Disciplines	Core concepts and ideas	Assess no.	Assessment technique, description and conditions	Dimensions
1	<p>Module 1: Water This module explores the fundamentals of safe water supply, including water chemistry, water treatment, catchment studies, water health, filtering processes, the meteorological causes of water shortage in Australia and possible water provision scenarios.</p> <p>Field work: 0 hours</p>	28	<p>Electives</p> <ul style="list-style-type: none"> • Health and lifestyles • Environments <p>Disciplines</p> <ul style="list-style-type: none"> • Chemistry • Earth and Environmental Science 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> • C1.1 Scientific literacy • C1.2 Scientific methodology • C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> • C2.1 Workplace safety • C2.2 Risk assessment • C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> • C3.1 Communication • C3.2 Self-management • C3.3 Problem-solving 	1	<p>Collection of work Complete a series of tasks related to the topic of water quality.</p> <ul style="list-style-type: none"> • Spoken component Oral presentation and interview questions acting as a local political candidate delivering a plan to tackle the decline in water quality in the community. 1.0–2.0 minutes • Test component Series of short items requiring sentence or short paragraph responses based on water chemistry and filtration. 20.0–30.0 minutes • Performance component Perform a series of laboratory tests including calibration of equipment to test water quality. 	<ul style="list-style-type: none"> • Knowing and understanding • Analysing and applying • Planning and evaluating
1	<p>Module 2: Environmental study This module expands on knowledge and skills developed in Module 1 to allow students to gain a deeper understanding of the impact they have on the world around them. This will be done by investigating a local waterway, analysing human and natural impacts.</p> <p>Field work: 5 hours</p>	27	<p>Electives</p> <ul style="list-style-type: none"> • Environments <p>Disciplines</p> <ul style="list-style-type: none"> • Biology • Chemistry • Earth and Environmental Science 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> • C1.1 Scientific literacy • C1.2 Scientific methodology • C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> • C2.1 Workplace safety • C2.2 Risk assessment • C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> • C3.1 Communication • C3.2 Self-management • C3.3 Problem-solving 	2	<p>Investigation Investigate a stream's health by travelling downstream and using various tests at various points. Analyse the findings, assess the conditions surrounding them and write a report providing conclusions/recommendations on the stream's overall health.</p> <ul style="list-style-type: none"> • Written response Report on the health of a local stream. Students collect the data in groups and complete the report individually. 500–800 words 	<ul style="list-style-type: none"> • Knowing and understanding • Analysing and applying • Planning and evaluating

Unit	Module number and description	Time in hours	Electives and Disciplines	Core concepts and ideas	Assess no.	Assessment technique, description and conditions	Dimensions
2	<p>Module 3: Heat-efficient houses This module investigates how designers use the thermal properties of different materials and builds an understanding of the physical processes associated with constructing heat-efficient buildings.</p> <p>Field work: 0 hours</p>	28	<p>Electives</p> <ul style="list-style-type: none"> Resources, energy and sustainability Discovery and change <p>Disciplines</p> <ul style="list-style-type: none"> Chemistry Physics 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> C1.1 Scientific literacy C1.2 Scientific methodology C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> C2.1 Workplace safety C2.2 Risk assessment C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> C3.1 Communication C3.2 Self-management C3.3 Problem-solving 	3	<p>Project Use different materials and design features to build an optimal heat-efficient model house.</p> <ul style="list-style-type: none"> Written component Report including a design proposal. Individual response. 400–700 words Product component Model of heat-efficient house. Individual response. Multimodal component — presentation Short video clip evaluating the building process and heat-efficiency. Individual response. 2.0–4.0 minutes 	<ul style="list-style-type: none"> Knowing and understanding Analysing and applying Planning and evaluating
2	<p>Module 4: Health and disease This module explores different diseases, their causes, methods of transmission, susceptible groups, long-term health effects and how they are controlled.</p> <p>Field work: 0 hours</p>	27	<p>Electives</p> <ul style="list-style-type: none"> Science for the workplace Health and lifestyles Environments <p>Disciplines</p> <ul style="list-style-type: none"> Biology Chemistry 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> C1.1 Scientific literacy C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> C2.1 Workplace safety C2.2 Risk assessment C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> C3.1 Communication C3.2 Self-management C3.3 Problem-solving 	4	<p>Extended response Respond to an unseen stimulus from a recent newspaper or magazine article.</p> <ul style="list-style-type: none"> Written response Report addressing a question based on a recent health issue in an article. 500–800 words 	<ul style="list-style-type: none"> Knowing and understanding Analysing and applying Planning and evaluating

Unit	Module number and description	Time in hours	Electives and Disciplines	Core concepts and ideas	Assess no.	Assessment technique, description and conditions	Dimensions
3	<p>Module 5: Forensics This module investigates the scientific methods employed in investigating different types of crimes. Students will explore forensic testing such as DNA analysis, determining unknown substances and crash scene investigations.</p> <p>Field work: 5 hours</p>	28	<p>Electives</p> <ul style="list-style-type: none"> • Discovery and change <p>Disciplines</p> <ul style="list-style-type: none"> • Biology • Chemistry • Physics 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> • C1.1 Scientific literacy • C1.2 Scientific methodology • C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> • C2.1 Workplace safety • C2.2 Risk assessment • C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> • C3.1 Communication • C3.2 Self-management • C3.3 Problem-solving 	5	<p>Collection of work Complete a series of tasks based on different crime scenes and forensic techniques.</p> <ul style="list-style-type: none"> • Spoken component Interview about DNA analysis of a crime scene. 1.5–2.5 minutes • Performance component Equipment calibration and determining unknown substances. • Test component Crash scene analysis. 20.0–30.0 minutes 	<ul style="list-style-type: none"> • Knowing and understanding • Analysing and applying • Planning and evaluating
3	<p>Module 6: Consumer protection In this module students develop investigation skills by investigating claims made about consumer products, such as foods and drinks, diets, cosmetics, medicines and fitness technology. Students develop skills that form the basis of many STEM careers and are valued by employers.</p> <p>Field work: 0 hours</p>	27	<p>Electives</p> <ul style="list-style-type: none"> • Science for the workplace • Health and lifestyles • Discovery and change <p>Disciplines</p> <ul style="list-style-type: none"> • Biology • Chemistry • Physics 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> • C1.1 Scientific literacy • C1.2 Scientific methodology • C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> • C2.1 Workplace safety • C2.2 Risk assessment • C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> • C3.1 Communication • C3.2 Self-management • C3.3 Problem-solving 	6	<p>Investigation Investigate the validity of the claims made by a company about its product.</p> <ul style="list-style-type: none"> • Written response Report addressing the validity of the company's claims based on tests conducted to investigate the product's effectiveness. 600–1000 words 	<ul style="list-style-type: none"> • Knowing and understanding • Analysing and applying • Planning and evaluating

Unit	Module number and description	Time in hours	Electives and Disciplines	Core concepts and ideas	Assess no.	Assessment technique, description and conditions	Dimensions
4	<p>Module 7: Microorganisms in food production This module investigates the making of common food products, such as bread, cheese, ginger beer and yoghurt, that use microorganisms in their production. Students learn to recognise industry standards and the importance of following safe work practices, while gaining an understanding of the biology and chemistry of microorganisms in the food industry.</p> <p>Field work: 0 hours</p>	28	<p>Electives</p> <ul style="list-style-type: none"> • Science for the workplace • Discovery and change <p>Disciplines</p> <ul style="list-style-type: none"> • Biology • Chemistry 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> • C1.1 Scientific literacy • C1.2 Scientific methodology <p>Workplace health and safety</p> <ul style="list-style-type: none"> • C2.1 Workplace safety • C2.2 Risk assessment • C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> • C3.1 Communication • C3.2 Self-management • C3.3 Problem-solving 	7	<p>Project Refine the brewing of a non-alcoholic ginger beer to improve the yield.</p> <ul style="list-style-type: none"> • Written component Journal of ginger beer-making processes and refinements. 500–900 words • Multimodal component — presentation Short video clip evaluating the processes. 3.0–6.0 minutes 	<ul style="list-style-type: none"> • Knowing and understanding • Analysing and applying • Planning and evaluating
4	<p>Module 8: Car service — New materials This module focuses on past and future advancements in motor vehicles, including continuous improvements in materials and technology.</p> <p>Field work: 0 hours</p>	27	<p>Electives</p> <ul style="list-style-type: none"> • Science for the workplace • Discovery and change <p>Disciplines</p> <ul style="list-style-type: none"> • Chemistry • Physics 	<p>Scientific literacy and working scientifically</p> <ul style="list-style-type: none"> • C1.1 Scientific literacy • C1.3 Thinking scientifically <p>Workplace health and safety</p> <ul style="list-style-type: none"> • C2.1 Workplace safety • C2.2 Risk assessment • C2.3 Safe working procedures <p>Communication and self-management</p> <ul style="list-style-type: none"> • C3.1 Communication • C3.2 Self-management 	8	<p>Extended response Respond to an unseen stimulus from a recent newspaper or magazine article.</p> <ul style="list-style-type: none"> • Written response Report addressing a question based on an article about a recent car enhancement. 600–1000 words 	<ul style="list-style-type: none"> • Knowing and understanding • Analysing and applying • Planning and evaluating

Science in Practice 2019

Teacher:

Class:

Student name:

Year:

Unit	Module of work	Assessment Instrument No.	Assessment Instrument	Formative or Summative	Knowing and understanding	Analysing and applying	Planning and evaluating
1	Module one Water	1	Collection of work	F			
	Module two Environmental study	2	Investigation	F			
2	Module three Heat-efficient houses	3	Project	S			
	Module four Health and disease	4	Extended response	S			
Interim Standards							
Interim Result							
3	Module five Forensics	5	Collection of work	S			
	Module six Consumer protection	6	Investigation	S			
4	Module seven Microorganisms in food production	7	Project	S			
	Module eight Car service — New materials	8	Extended response	S			
Exit Standards							
Exit Result							