Psychology 2019 v1.4

General Senior Syllabus

This syllabus is for implementation with Year 11 students in 2019.

Queensland Government | Queensland Curriculum & Assessment Authority

For all Queensland schools

220806

Contents

1 Course overview

1.1 Introduction

1.1.1 Rationale

At the core of all science endeavour is the inquiry into the nature of the universe. Science uses a systematic way of thinking, involving creative and critical reasoning, in order to acquire better and more knowledge. Scientists recognise that knowledge is not fixed, but is fallible and open to challenge. As such, scientific endeavour is never conducted in isolation, but builds on and challenges an existing body of knowledge in the pursuit of more reliable knowledge. This collaborative process, whereby new knowledge is gained, is essential to the cooperative advancement of science, technology, health and society in the 21st century.

Tertiary study in any field will be aided by the transferable skills developed in this senior Science subject. It is expected that an appreciation of, and respect for, evidence-based conclusions and the processes required to gather, scrutinise and use evidence, will be carried forward into all aspects of life beyond the classroom.

The purpose of senior Science subjects in Queensland is to introduce students to a scientific discipline. Students will be required to learn and apply aspects of the knowledge and skill of the discipline (thinking, experimentation, problem-solving and research skills), understand how it works and how it may impact society.

Upon completion of the course, students will have an appreciation for a body of scientific knowledge and the process that is undertaken to acquire this knowledge. They will be able to distinguish between claims and evidence, opinion and fact, and conjecture and conclusions.

In each of the senior Science subjects, students will develop:

- a deep understanding of a core body of discipline knowledge
- aspects of the skills used by scientists to develop new knowledge, as well as the opportunity to refine these skills through practical activities
- the ability to coordinate their understandings of the knowledge and skills associated with the discipline to refine experiments, verify known scientific relationships, explain phenomena with justification and evaluate claims by finding evidence to support or refute the claims.

Psychology provides opportunities for students to engage with concepts that explain behaviours and underlying cognitions. In Unit 1, students examine individual development in the form of the role of the brain, cognitive development, human consciousness and sleep. In Unit 2, students investigate the concept of intelligence, the process of diagnosis and how to classify psychological disorder and determine an effective treatment, and lastly, the contribution of emotion and motivation on the individual behaviour. In Unit 3, students examine individual thinking and how it is determined by the brain, including perception, memory, and learning. In Unit 4, students consider the influence of others by examining theories of social psychology, interpersonal processes, attitudes and cross-cultural psychology.

Psychology aims to develop students':

- interest in psychology and their appreciation for how this knowledge can be used to understand contemporary issues
- appreciation of the complex interactions, involving multiple parallel processes that continually influence human behaviour
- understanding that psychological knowledge has developed over time and is used in a variety of contexts, and is informed by social, cultural and ethical considerations
- ability to conduct a variety of field research and laboratory investigations involving collection and analysis of qualitative and quantitative data and interpretation of evidence
- ability to critically evaluate psychological concepts, interpretations, claims and conclusions with reference to evidence
- ability to communicate psychological understandings, findings, arguments and conclusions using appropriate representations, modes and genres.

Assumed knowledge, prior learning or experience

The P–10 Australian Curriculum: Science is assumed knowledge for this syllabus.

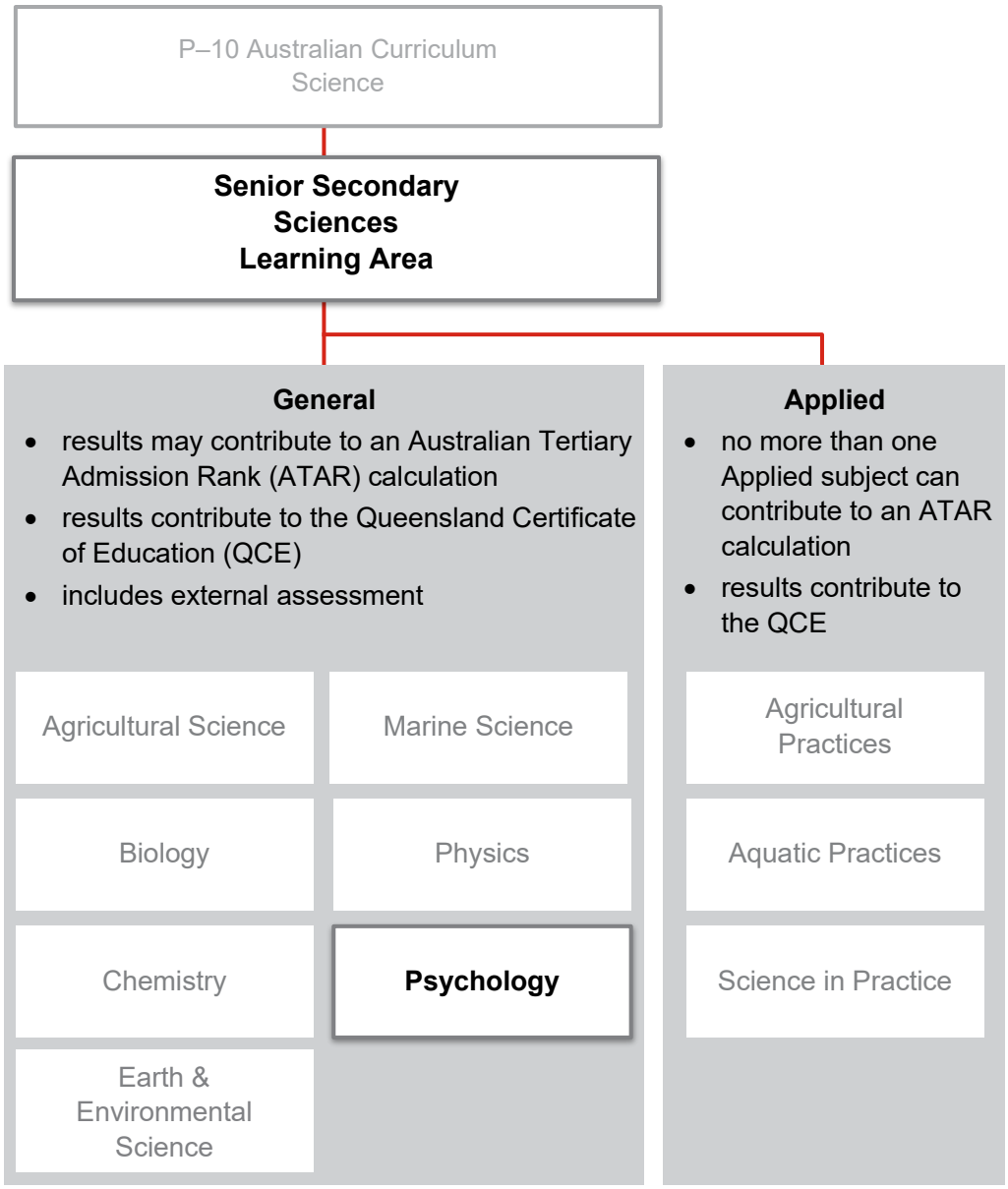
Pathways

Psychology is a General subject suited to students who are interested in pathways beyond school that lead to tertiary studies, vocational education or work. A course of study in Psychology can establish a basis for further education and employment in the fields of psychology, sales, human resourcing, training, social work, health, law, business, marketing and education.

1.1.2 Learning area structure

All learning areas build on the P–10 Australian Curriculum.

Figure 1: Learning area structure



1.1.3 Course structure

Psychology is a course of study consisting of four units. Subject matter, learning experiences and assessment increase in complexity from Units 1 and 2 to Units 3 and 4 as students develop greater independence as learners.

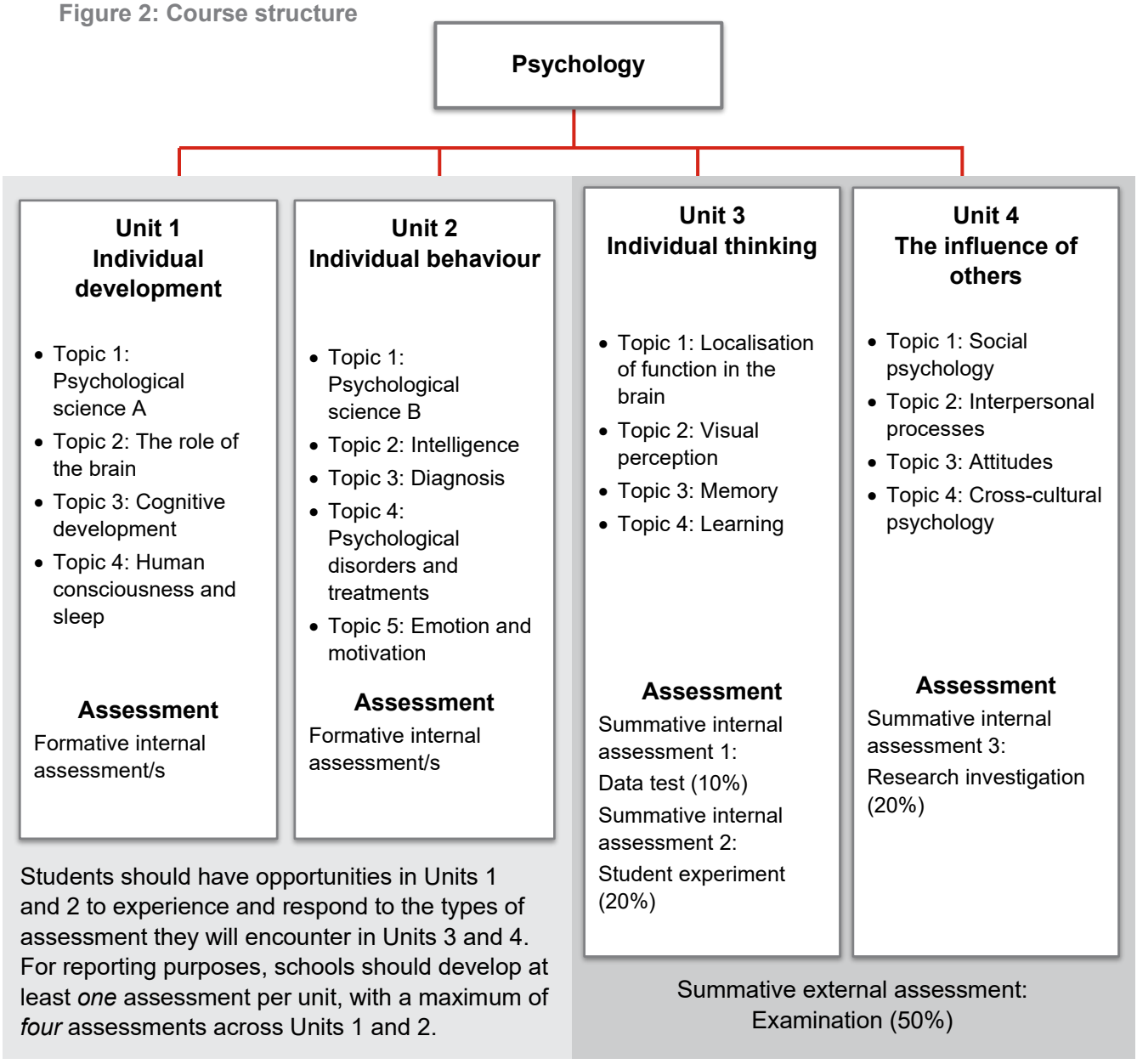
Units 1 and 2 provide foundational learning, which allows students to experience all syllabus objectives and begin engaging with the course subject matter. Students should complete Units 1 and 2 before beginning Units 3 and 4.

Units 3 and 4 consolidate student learning. Only the results from Units 3 and 4 will contribute to ATAR calculations.

Figure 2 outlines the structure of this course of study.

Each unit has been developed with a notional time of 55 hours of teaching and learning, including assessment.

Figure 2: Course structure



1.2 Teaching and learning

1.2.1 Syllabus objectives

The syllabus objectives outline what students have the opportunity to learn. Assessment provides evidence of how well students have achieved the objectives.

Syllabus objectives inform unit objectives, which are contextualised for the subject matter and requirements of the unit. Unit objectives, in turn, inform the assessment objectives, which are further contextualised for the requirements of the assessment instruments. The number of each objective remains constant at all levels, i.e. Syllabus objective 1 relates to Unit objective 1 and to Assessment objective 1 in each assessment instrument.

Syllabus objectives are described in terms of actions that operate on the subject matter. Students are required to use a range of cognitive processes in order to demonstrate and meet the syllabus objectives. These cognitive processes are described in the explanatory paragraph following each objective in terms of four levels: retrieval, comprehension, analytical processes (analysis), and knowledge utilisation, with each process building on the previous processes (see Marzano & Kendall 2007, 2008). That is, comprehension requires retrieval, and knowledge utilisation requires retrieval, comprehension and analytical processes (analysis).

By the conclusion of the course of study, students will:

Syllabus objective	Unit 1	Unit 2	Unit 3	Unit 4
1. describe and explain scientific concepts, theories, models and systems and their limitations	•	•	•	•
2. apply understanding of scientific concepts, theories, models and systems within their limitations	•	•	•	•
3. analyse evidence	•	•	•	•
4. interpret evidence	•	•	•	•
5. investigate phenomena	•	•	•	•
6. evaluate processes, claims and conclusions	•	•	•	•
7. communicate understandings, findings, arguments and conclusions	•	•	•	•

1. describe and explain scientific concepts, theories, models and systems and their limitations

When students describe and explain scientific concepts, theories, models and systems and their limitations, they give a detailed account of a concept, theory, model or system by making relationships, reasons or causes evident. They reflect on relevant social, economic, ethical and cultural factors.

2. apply understanding of scientific concepts, theories, models and systems within their limitations

When students apply their understanding of scientific concepts, theories, models and systems within their limitations, they explain local, regional and global phenomena and determine outcomes, behaviours and implications. They use algebraic, visual and graphical representations of scientific relationships and data to determine unknown scientific quantities or variables. They recognise the limitations of models and theories when discussing results.

3. **analyse evidence**

   When students analyse evidence, they recognise the variety of forms of evidence, and distinguish between quantitative, qualitative, primary and secondary evidence. When students analyse evidence in the form of qualitative data, they identify the essential elements, features or components of the data. When students analyse evidence in the form of quantitative data, they use mathematical processes to identify trends, patterns, relationships, limitations and uncertainty in the data.

4. **interpret evidence**

   When students interpret evidence, they use their knowledge and understanding of scientific concepts, theories, models and systems and their limitations to draw conclusions based on their analysis of qualitative and quantitative evidence and established criteria.

5. **investigate phenomena**

   When students investigate phenomena, they plan and carry out experimental and/or research activities in order to obtain evidence for the purpose of reaching a conclusion. They collect, collate and process evidence. Students ensure that relevant ethical, environmental and safety considerations have been incorporated into their practice.

6. **evaluate processes, claims and conclusions**

   When students evaluate processes, claims and conclusions, they critically reflect on the available evidence and make judgments about its application to a research question, and its use to inform further investigation. When students evaluate processes, they use the quality of the evidence to evaluate the validity and reliability of the method used, the appropriateness of assumptions made and possible refinements required. When students evaluate claims, they identify the evidence that would be required to support or refute the claim. They scrutinise evidence for bias, conjecture, alternatives or inaccuracies. When students evaluate conclusions, they consider the credibility of the supporting evidence.

7. **communicate understandings, findings, arguments and conclusions**

   When students communicate, they use scientific representations and language within appropriate genres to present information. They use technology to share knowledge by exchanging information and creating information products.

1.2.2 Underpinning factors

There are three skill sets that underpin senior syllabuses and are essential for defining the distinctive nature of subjects:

- literacy — the set of knowledge and skills about language and texts essential for understanding and conveying Psychology content
- numeracy — the knowledge, skills, behaviours and dispositions that students need to use mathematics in a wide range of situations, to recognise and understand the role of mathematics in the world, and to develop the dispositions and capacities to use mathematical knowledge and skills purposefully
- 21st century skills — the attributes and skills students need to prepare them for higher education, work and engagement in a complex and rapidly changing world.

These skill sets, which overlap and interact, are derived from current education, industry and community expectations and encompass the knowledge, skills, capabilities, behaviours and dispositions that will help students live and work successfully in the 21st century.

Together these three skill sets shape the development of senior subject syllabuses. Although coverage of each skill set may vary from syllabus to syllabus, students should be provided with opportunities to learn through and about these skills over the course of study. Each skill set contains identifiable knowledge and skills that can be directly assessed.

Literacy in Psychology

The skills of literacy in science (distinct from 'scientific literacy') are essential for successful scientific inquiry (Douglas et al. 2006, Saul 2004, Yore et al. 2003). In any scientific inquiry activity, literacy skills support students by enabling them to grapple with ideas, conduct research, discuss their thoughts, enhance conceptual understanding and solve problems (Krajcik & Southerland 2010).

The literacy skills important to this subject are those related to the comprehension and composition of texts that provide information, describe and explain events and phenomena, report on experiments, present and analyse data, and offer opinions or claims (ACARA 2015a). Psychology students comprehend and compose multimedia texts, such as reports, charts, graphs, diagrams, pictures, maps, animations, models and other visual media. They understand and apply language structures that are used to link information and ideas, give descriptions and explanations, formulate research questions and construct evidence-based arguments capable of expressing an informed position (ACARA 2015a).

Students learn these skills by having opportunity to engage with:

- rich and varied science and media texts
- class activities that use literacy as a tool for learning
- strategies for reading scientific texts (Moore 2009).

The learning opportunities described above can be integrated with stimulus questions, Science as a Human Endeavour subject matter and mandatory practicals. Students could be asked to:

- explain links between new ideas and prior knowledge and experiences
- engage in learning experiences directed by a question that is meaningful to their lives
- connect multiple representations of a concept (e.g. written texts, formulas, graphs or diagrams of the same concept)
- use scientific ideas to compose evidence-based conclusions in the mandatory practicals
- engage with the discourses of science such as those found in scientific literature and media texts (Krajcik & Southerland 2010).

These strategies will promote students' ability to read, write and communicate about science so that they can engage with science-related issues throughout their lives.

These aspects of literacy knowledge and skills are embedded in the syllabus objectives, unit objectives and subject matter, and instrument-specific marking guides (ISMGs) for Psychology.

Numeracy in Psychology

The skills of numeracy in Psychology are essential for successful scientific inquiry. In any scientific inquiry activity, numeracy skills support students by enabling them to make and record observations; order, represent and analyse data; and interpret trends and relationships (ACARA 2015b).

The numeracy skills important to this subject are those related to the interpretation of complex spatial and graphical representations, and the appreciation of the ways in which scientific concepts, theories, systems and models are structured, communicated, interact or change across spatial and temporal scales (ACARA 2015b). Students will use knowledge and skills in areas such as:

- graphing
- ratio and proportion
- converting from one unit to another
- scientific notation
- an understanding of place in number (significant figures)
- estimation and calculation in order to analyse data
- determining the reliability of data
- interpreting and manipulating mathematical relationships in order to calculate and predict values (ACARA 2009, 2015).

Students will learn these skills as they:

- measure and record data during the mandatory practicals
- use or interpret meaning from formulas
- interpret graphical information presented in science and media texts
- undertake class activities that use numeracy as a tool for learning
- use mathematics or equations as justification or evidence for conclusions
- interpret and represent information in a variety of forms.

These opportunities will promote students' ability to develop and use numeracy skills in Psychology.

These aspects of numeracy knowledge and skills are embedded in the syllabus objectives, unit objectives and subject matter, and ISMGs for Psychology.

21st century skills

The 21st century skills identified in this syllabus reflect a common agreement, both in Australia and internationally, on the skills and attributes students need to prepare them for higher education, work and engagement in a complex and rapidly changing world.

21st century skills	Associated skills	21st century skills	Associated skills
critical thinking	• analytical thinking • problem-solving • decision-making • reasoning • reflecting and evaluating • intellectual flexibility	creative thinking	• innovation • initiative and enterprise • curiosity and imagination • creativity • generating and applying new ideas • identifying alternatives • seeing or making new links
communication	• effective oral and written communication • using language, symbols and texts • communicating ideas effectively with diverse audiences	collaboration and teamwork	• relating to others (interacting with others) • recognising and using diverse perspectives • participating and contributing • community connections
personal and social skills	• adaptability/flexibility • management (self, career, time, planning and organising) • character (resilience, mindfulness, open- and fair-mindedness, self-awareness) • leadership • citizenship • cultural awareness • ethical (and moral) understanding	information and communication technologies (ICT) skills	• operations and concepts • accessing and analysing information • being productive users of technology • digital citizenship (being safe, positive and responsible online)

Psychology helps develop the following 21st century skills:

- critical thinking
- creative thinking
- communication
- collaboration and teamwork
- personal and social skills
- information and communication technologies (ICT) skills.

These elements of 21st century skills are embedded in the syllabus objectives, unit objectives and subject matter, and ISMGs for Psychology.

1.2.3 Aboriginal perspectives and Torres Strait Islander perspectives

The QCAA is committed to reconciliation in Australia. As part of its commitment, the QCAA affirms that:

- Aboriginal peoples and Torres Strait Islander peoples are the first Australians, and have the oldest living cultures in human history
- Aboriginal peoples and Torres Strait Islander peoples have strong cultural traditions and speak diverse languages and dialects, other than Standard Australian English
- teaching and learning in Queensland schools should provide opportunities for students to deepen their knowledge of Australia by engaging with the perspectives of Aboriginal peoples and Torres Strait Islander peoples
- positive outcomes for Aboriginal students and Torres Strait Islander students are supported by successfully embedding Aboriginal perspectives and Torres Strait Islander perspectives across planning, teaching and assessing student achievement.

Guidelines about Aboriginal perspectives and Torres Strait Islander perspectives and resources for teaching are available at www.qcaa.qld.edu.au/k-12-policies/aboriginal-torres-strait-islander-perspectives.

Where appropriate, Aboriginal perspectives and Torres Strait Islander perspectives have been embedded in the subject matter.

1.2.4 Pedagogical and conceptual frameworks

Defining *inquiry* in science education

This syllabus provides guidance to support schools in aligning a chosen pedagogical framework with the curriculum and assessment expectations outlined in this syllabus. This guidance clarifies the use of the term inquiry and articulates a framework to describe the process of inquiry. The purpose of this guidance is to prevent misunderstandings and problematic conflations and their subsequent negative impact on student learning. As Abrams, Southerland and Silva (2008, p. xv) stated in their book, *Inquiry in the Classroom: Realities and opportunities*:

> Inquiry in the classroom can be conceived as a complex set of ideas, beliefs, skills, and/or pedagogies. It is evident that attempting to select a singular definition of inquiry may be an insurmountable and fruitless task. Any single definition of inquiry in the classroom would necessarily reflect the thinking of a particular school of thought, at a particular moment in time, or a particular goal, and such a singular definition may serve to limit legitimate and necessary components of science learning. **However, operating without a firm understanding of the various forms of inquiry leaves science educators often 'talking past' one another, and often results in very muddled attempts in the classroom**.

Uses of the term *inquiry*

Common phrases involving the term *inquiry* have been listed below:

- science inquiry
- science inquiry skills
- the inquiry process
- inquiry-based learning.

This syllabus refers to the first three uses listed above. The first, *science inquiry*, defines the practical work of a scientist (Harlen 2013). The second, *science inquiry skills*, refers to the skills required to do the work of a scientist (Harlen 2013). The third, *the inquiry process*, is a framework that can be used to describe the process of asking a question and then answering it.

The final phrase, *inquiry-based learning*, refers to a variety of teaching and learning strategies an educator may choose to use within their school's pedagogical framework. Although a school may choose to adopt an inquiry-based pedagogy, this syllabus is *not* intended to endorse or recommend an inquiry-based learning approach.

Science inquiry and science inquiry skills

Science inquiry involves identifying and posing questions and working to answer them. It is concerned with evaluating claims, investigating ideas, solving problems, reasoning, drawing valid conclusions and developing evidence-based arguments. It can easily be summarised as the 'work of a scientist' (Hackling 2005).

Within this syllabus, it is expected that students will engage in *aspects* of the work of a scientist by engaging in science inquiry (Tytler 2007). This expectation can be seen, for example, in the inclusion of the student experiment, research investigation, and mandatory practicals.

Science inquiry skills are the skills required to do the work of a scientist. They include writing research questions, planning, conducting, recording information and reflecting on investigations; processing, analysing and interpreting evidence; evaluating conclusions, processes and claims; and communicating findings (ACARA 2015).

It is expected that students are taught science inquiry skills (Krajcik et al. 2000). The syllabus outlines a number of these skills in the subject matter. Some science inquiry skills will be used to complete the mandatory and suggested practicals. The selection, application and coordination of science inquiry skills will be required in the student experiment and research investigation.

Teachers decide how the science inquiry skills are to be developed. For example, teachers will determine how mandatory practicals are used as opportunities to:

- develop, rehearse and refine science inquiry skills
- engage students in scaffolded or open-ended science inquiry tasks
- formatively assess science inquiry skills.

Framework to describe the inquiry process

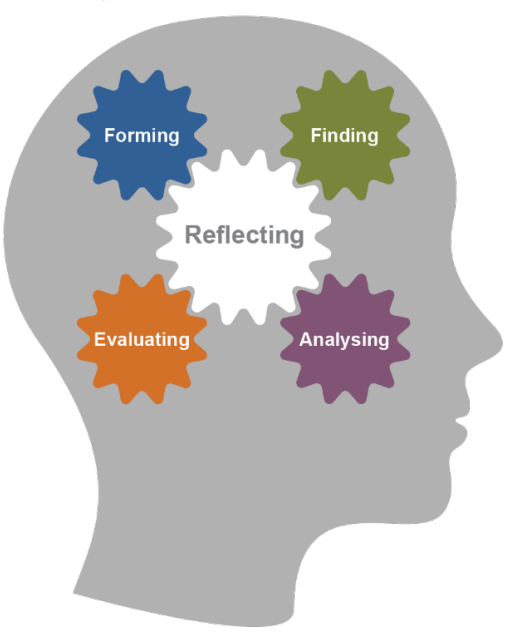
In order to support student engagement in activities involving inquiry, it is useful to establish a common language or framework to distinguish between stages of the process.

The stages involved in any inquiry are:

- forming and describing the inquiry activity
- finding valid and reliable evidence for the inquiry activity
- analysing and interpreting the evidence selected
- evaluating the conclusions, processes or claims.

This framework uses reflection as the connection between, and driver of, all the stages. The progression through the inquiry process requires reflection on the decisions made and any new information that has emerged during the process to inform the next stage. Each stage of the inquiry process is worthy of reflection, the result of which may be the revision of previous stages (Marzano & Kendall 2007).

Figure 3: Stages of inquiry process



Safety and ethics

Workplace health and safety

Psychology is designed to expose students to the practical components of science through practical experiences in the laboratory and the field. These experiences expose students to a variety of hazards, from biological and poisonous substances to injury from equipment. Besides a teacher's duty of care that derives from the *Education (General Provisions) Act 2006*, there are other legislative and regulatory requirements, for example the *Work Health and Safety Act 2011*, that will influence the nature and extent of practical work.

All practical work must be organised with student safety in mind. *Department of Education and Training (DET) Policy and Procedure Register* provides guidance about current science safety protocols.

It is the responsibility of all schools to ensure that their practices meet current legislation requirements. References to relevant legislation and regulations are supported by the Reference list located on the Psychology subject page of the QCAA website.

Wellbeing

The study of psychology may include potentially sensitive topics. Teachers should ensure that students have opportunities to consider topics scientifically and objectively. Students should not be asked to disclose personal information about their own or others' health status and behaviours.

When dealing with sensitive mental health matters, students should be given information as appropriate about sourcing available treatment services within and outside of school.

Care and conduct in research involving humans

Governing principles

The QCAA recognises that teachers and schools involved in teaching and learning activities that include experimental investigations involving human subjects have a legal obligation and a moral responsibility to ensure that students follow ethical principles at all times. Best practice includes protecting participants from harm, gaining informed consent and ensuring confidentiality and anonymity.

- **Protection from harm** — any investigations that create harm, distress or discomfort for participants are not permitted. This includes investigations involving ingestion (e.g. food, drink, smoking, or drugs) and deprivation (e.g. sleep, food).
- **Gaining informed consent** — any experiments involving humans must be with their written permission. Students under the age of 16 should have written permission from parent/s or carer/s. All participants should be above 12 years of age and not considered to be vulnerable, 'at risk' or have diminished ability to make their own decisions. The process of being informed requires that participants understand the purpose of the investigation and that they can withdraw from the process at any stage.
- **Ensuring confidentiality and anonymity** — all data collected must be kept in a confidential and responsible manner and not divulged to any other person. Anonymity for each participant must be guaranteed.

National guidelines

Teachers should refer to the following for detailed advice:

- the *National Statement on Ethical Conduct in Human Research* (2007), issued by the National Health and Medical Research Council (NHMRC) in accordance with the *NHMRC Act 1992* (Cwlth), www.nhmrc.gov.au/guidelines-publications/e72
- the National Privacy Principles in the *Privacy Amendment (Private Sector) Act 2000* (Cwlth), www.privacy.gov.au
- the Code of Ethics of the Australian Psychological Society (APS), www.psychology.org.au.

1.2.5 Subject matter

Subject matter is the body of information, mental procedures and psychomotor procedures (see Marzano & Kendall 2007, 2008) that are necessary for students' learning and engagement with Psychology. It is particular to each unit in the course of study and provides the basis for student learning experiences.

Subject matter has a direct relationship to the unit objectives, but is of a finer granularity and is more specific. These statements of learning are constructed in a similar way to objectives. Each statement:

- describes an action (or combination of actions) — what the student is expected to do
- describes the element — expressed as information, mental procedures and/or psychomotor procedures
- is contextualised to the topic or circumstance particular to the unit.

Organisation of subject matter

The subject matter is organised as topics within each unit.

The subject matter indicates the required knowledge and skills that students must acquire. Students should experience the mandatory practicals.

The subject matter from Units 3 and 4 will be assessed by the external examination.

Science as a Human Endeavour

Each Queensland senior science subject requires students to learn and apply aspects of the knowledge and skill of the discipline. However, it is recognised that students should also develop an appreciation for the *nature* and *development* of science, and its *use* and *influence* on society.

While this appreciation will not be assessed, the syllabus provides guidance as to where it may be developed. Importantly, this guidance draws students' attention to the way in which science operates, both in relation to the development of understanding and explanations about the world and to its influence on society.

Students should become familiar with the following Science as a Human Endeavour (SHE) concepts:

- Science is a global enterprise that relies on clear communication, international conventions, peer review and reproducibility.
- Development of complex models and/or theories often requires a wide range of evidence from multiple individuals and across disciplines.
- Advances in science understanding in one field can influence other areas of science, technology and engineering.
- The use and acceptance of scientific knowledge is influenced by social, economic, cultural and ethical contexts.
- The use of scientific knowledge may have beneficial and/or harmful and/or unintended consequences.
- Scientific knowledge can enable scientists to offer valid explanations and make reliable predictions.
- Scientific knowledge can be used to develop and evaluate projected economic, social and environmental impacts and to design action for sustainability.
- ICT and other technologies have dramatically increased the size, accuracy and geographic and temporal scope of datasets with which scientists work.
- Models and theories are contested and refined or replaced when new evidence challenges them, or when a new model or theory has greater explanatory power.
- Scientific knowledge can be used to inform the monitoring, assessment and evaluation of risk.
- Science can be limited in its ability to provide definitive answers to public debate; there may be insufficient reliable data available, or interpretation of the data may be open to question.
- International collaboration is often required when investing in large-scale science projects or addressing issues for the Asia–Pacific region.

To support the development of these concepts, this syllabus identifies SHE guidance in each topic. This highlights opportunities for teachers to contextualise the associated subject matter and provides stimulus for the development of claims and research questions for investigation.

Additional opportunities include:

- the mandatory and suggested practicals provide opportunity for students to witness the *nature* of science
- the student experiment provides opportunity for students to experience how the *development* of new science knowledge is built upon existing knowledge
- a research investigation that provides opportunity for students to appreciate the *use* and *influence* of scientific evidence to make decisions or to contribute to public debate about a claim.

Finally, the SHE statements at the end of each topic may be used to support the development and interrogation of claims, and be useful as a starting point for the research investigation.

Key research skills in Psychology

The development of a set of key research skills is a core component of the study of Psychology and applies across Units 1 to 4 of the syllabus. In designing teaching and learning programs and in assessing student learning, teachers should ensure that students are given the opportunity to develop, use and demonstrate these skills in a variety of contexts when:

- undertaking their own experiments
- evaluating the research of others.

Key research skill	Associated skills across Units 1 to 4
Define the research question, state the hypotheses and determine variables to test	• Determine – research questions – null hypotheses and alternative hypotheses – independent variables and dependent variables.
Design the methodology	• Access and synthesise relevant secondary sources. • Distinguish between types of investigations – experiments (control and experimental groups) – correlational research designs – quasi-experimental designs – case studies – observational research designs – self-report research designs – interviews. • Identify and use experimental research designs – independent groups design – matched participants design – repeated measures design. • Identify and use appropriate equipment, materials and procedures. • Identify and use appropriate sampling procedures for selection and allocation of participants – convenience sampling – random sampling – stratified sampling – random allocation. • Minimise extraneous variables and confounding variables by considering – type of participant selection and allocation

Key research skill	Associated skills across Units 1 to 4
	– research designs – single blind procedures and double blind procedures – counterbalancing – standardised instructions and procedures.
Comply with ethical guidelines	• Understand the role of ethics committees in approving research. • Appreciate and apply ethical principles – consideration of the role of the experimenter – protection and security of participants' information – confidentiality – voluntary participation – withdrawal rights – informed consent procedures – use of deception in research – debriefing.
Collect data	• Collect and record qualitative and quantitative data.
Process data, and analyse and interpret evidence	• Distinguish between levels of measurement – nominal – ordinal – interval – ratio. • Present data in visual (e.g. tables) and graphical representations. • Process data and analyse evidence – descriptive statistics ▪ measures of central tendency: mean, median and mode ▪ measures of dispersion: interquartile range, standard deviation and standard error – correlation ▪ Pearson correlation coefficient ▪ Spearman's rank correlation coefficient – statistical tests of inference ▪ parametric: two-sample t-test (unpaired and paired) ▪ non-parametric: Mann–Whitney U test, Wilcoxon signed-ranks test ▪ confidence intervals – qualitative methods: inductive content analysis. • Interpret evidence – descriptive statistics – statistical significance – type I errors and type II errors – correlation coefficients. • Judge the reliability and validity of the experimental process – reliability of observers (selection, training) – reliability of psychological tests – internal validity and external (population and ecological) validity – validity of psychological tests (face, content, concurrent, predictive). • Explain the merit of replicating procedures.

Key research skill	Associated skills across Units 1 to 4
Draw conclusions	• Draw conclusions consistent with evidence. • Draw conclusions that are relevant to the question under investigation. • Identify and explain the limitations of conclusions, with reference to the analysis of evidence, uncertainty and limitations of the data. • Suggest improvements and further research. • Understand the role of peer review in scientific research.
Communicate scientifically	• Use appropriate psychological terminology, representations and conventions for reporting research. • Acknowledge sources of information and use standard scientific referencing conventions.

Guidance

The guidance included with each topic is designed to clarify the scope of the subject matter and identify opportunities to integrate science inquiry skills and SHE strands into the subject matter. A number of tags are used to highlight aspects of the guidance:

- **Notional time:** the depth of subject matter coverage is indicated by the amount of time needed to cover this subject matter in the sequence presented in the syllabus.
- **Formula:** defines a formula described in the subject matter.
- **SHE:** identifies an opportunity to integrate an aspect of the Science as a Human Endeavour strand and may also be used as a starting point for a research investigation.
- **Stimulus questions:** identifies questions that could be used to stimulate student interest or as the starting point for a research investigation.
- **Suggested practical:** identifies an opportunity for inquiry skills to be developed and may be used as a starting point for a student experiment.
- **Suggested research:** identifies research studies that supplement learning of the subject matter. See the suggested resources following each topic.
- **Syllabus links:** identifies links between syllabus units.

1.3 Assessment — general information

Assessments are formative for Units 1 and 2, and summative for Units 3 and 4.

Assessment	Unit 1	Unit 2	Unit 3	Unit 4
Formative assessments	•	•		
Summative internal assessment 1			•	
Summative internal assessment 2			•	
Summative internal assessment 3				•
Summative external assessment			•	•

1.3.1 Formative assessments — Units 1 and 2

Formative assessments provide feedback to both students and teachers about each student's progress in the course of study.

Schools develop internal assessments for each senior subject based on the learning described in Units 1 and 2 of the subject syllabus. Each unit objective must be assessed at least once.

For reporting purposes, schools should devise at least *two* but no more than *four* assessments for Units 1 and 2 of this subject. At least *one* assessment must be completed for *each* unit.

The sequencing, scope and scale of assessments for Units 1 and 2 are matters for each school to decide and should reflect the local context.

Teachers are encouraged to use the A–E descriptors in in the reporting standards (Section 1.5) to provide formative feedback to students and to report on progress.

1.3.2 Summative assessments — Units 3 and 4

Students will complete a total of *four* summative assessments — three internal and one external — that count towards their final mark in each subject.

Schools develop *three* internal assessments for each senior subject, based on the learning described in Units 3 and 4 of the syllabus.

The three summative internal assessments will be endorsed and the results confirmed by the QCAA. These results will be combined with a single external assessment developed and marked by the QCAA. The external assessment results for Psychology will contribute 50% towards a student's result.

Summative internal assessment — instrument-specific marking guides

This syllabus provides ISMGs for the three summative internal assessments in Units 3 and 4.

The ISMGs describe the characteristics evident in student responses and align with the identified assessment objectives. Assessment objectives are drawn from the unit objectives and are contextualised for the requirements of the assessment instrument.

Criteria

Each ISMG groups assessment objectives into criteria. An assessment objective may appear in multiple criteria, or in a single criterion of an assessment.

Making judgments

Assessment evidence of student performance in each criterion is matched to a performance-level descriptor, which describes the typical characteristics of student work.

Where a student response has characteristics from more than one performance level, a best-fit approach is used. Where a performance level has a two-mark range, it must be decided if the best fit is the higher or lower mark of the range.

Authentication

Schools and teachers must have strategies in place for ensuring that work submitted for internal summative assessment is the student's own. Authentication strategies outlined in QCAA guidelines, which include guidance for drafting, scaffolding and teacher feedback, must be adhered to.

Summative external assessment

The summative external assessment adds valuable evidence of achievement to a student's profile. External assessment is:

- common to all schools
- administered under the same conditions at the same time and on the same day
- developed and marked by the QCAA according to a commonly applied marking scheme.

The external assessment contributes 50% to the student's result in Psychology. It is not privileged over the internal assessments.

1.4 Reporting standards

Reporting standards are summary statements that succinctly describe typical performance at each of the five levels (A–E). They reflect the cognitive taxonomy and objectives of the course of study.

The primary purpose of reporting standards is for twice-yearly reporting on student progress. These descriptors can also be used to help teachers provide formative feedback to students and to align ISMGs.

A
The student accurately describes and explains a variety of concepts, theories, models and systems, and their limitations. They give clear and detailed accounts of a variety of concepts, theories, models and systems by making relationships, reasons or causes evident. The student accurately applies their understanding of scientific concepts, theories, models and systems within their limitations to explain a variety of phenomena, and predict outcomes, behaviours and implications. They accurately use representations of scientific relationships and data to determine a variety of unknown scientific quantities and perceptively recognise the limitations of models and theories when discussing results. The student analyses evidence systematically and effectively by identifying the essential elements, features or components of qualitative data. They use relevant mathematical processes to appropriately identify trends, patterns, relationships, limitations and uncertainty in quantitative data. They interpret evidence insightfully by using their knowledge and understanding to draw justified conclusions based on their thorough analysis of evidence and established criteria. The student investigates phenomena by carrying out effective experiments and research investigations. They efficiently collect, collate and process relevant evidence. They critically evaluate processes, claims and conclusions by insightfully scrutinising evidence, extrapolating credible findings, and discussing the reliability and validity of experiments. The student communicates effectively by using scientific representations and language accurately and concisely within appropriate genres.
B
The student accurately describes and explains concepts, theories, models and systems, and their limitations. They give clear and detailed accounts of concepts, theories, models and systems by making relationships, reasons or causes evident. The student accurately applies their understanding of scientific concepts, theories, models and systems within their limitations to explain phenomena and predict outcomes, behaviours and implications. They accurately use representations of scientific relationships and data to determine unknown scientific quantities, and accurately recognise the limitations of models and theories when discussing results. The student analyses evidence by effectively identifying the essential elements, features or components of qualitative data. They use mathematical processes to appropriately identify trends, patterns, relationships, limitations and uncertainty in quantitative data. They interpret evidence by using their knowledge and understanding to draw reasonable conclusions based on their accurate analysis of evidence and established criteria. The student investigates phenomena by carrying out effective experiments and research investigations. They collect, collate and process relevant evidence. They evaluate processes, claims and conclusions by scrutinising evidence, applying relevant findings and discussing the reliability and validity of experiments. The student communicates accurately by using scientific representations and language within appropriate genres to present information.

C
The student describes and explains concepts, theories, models and systems, and their limitations. They give detailed accounts of concepts, theories, models and systems by making relationships, reasons or causes evident. The student applies their understanding of scientific concepts, theories, models and systems within their limitations to explain phenomena and predict outcomes, behaviours and implications. They use representations of scientific relationships and data to determine unknown scientific quantities and recognise the limitations of models and theories when discussing results. The student analyses evidence by identifying the essential elements, features or components of qualitative data. They use mathematical processes to identify trends, patterns, relationships, limitations and uncertainty in quantitative data. They interpret evidence by using their knowledge and understanding to draw conclusions based on their analysis of evidence and established criteria. The student investigates phenomena by carrying out experiments and research investigations. They collect, collate and process evidence. They evaluate processes, claims and conclusions by describing the quality of evidence, applying findings, and describing the reliability and validity of experiments. The student communicates using scientific representations and language within appropriate genres to present information.
D
The student describes and gives accounts of aspects of concepts, theories, models and systems. They use rudimentary representations of scientific relationships or data to determine unknown scientific quantities or variables. The student analyses evidence by identifying the elements, features or components of qualitative data. They use parts of mathematical processes to identify trends, patterns, relationships, limitations or uncertainty in quantitative data. They interpret evidence by drawing conclusions based on evidence or established criteria. The student carries out aspects of experiments and research investigations. They discuss processes, claims or conclusions. They consider the quality of evidence and conclusions. The student uses scientific representations or language to present information.
E
The student describes scenarios and refers to representations of information. They discuss physical phenomena and evidence. They follow established methodologies in research situations. They discuss evidence. The student carries out elements of experiments and research investigations. The student communicates information.

2 Unit 1: Individual development

2.1 Unit description

In Unit 1, students explore the scientific method as the process for producing contemporary research in psychology. An understanding of the original philosophical debates to inform psychology — including free will versus determinism, and nature versus nurture — provides an essential lens for examining all perspectives within psychology. Students investigate the structure and function of the human brain and how this affects individual development and behaviour. They examine factors within cognitive development, and explore changes that occur over the lifespan. Lastly, they explore different forms of consciousness and theories for the function of sleep.

Contexts that could be investigated in this unit include the impact of orphanages on childhood development, the influence of technology on 21st century lives, and the effect of sleep deprivation on cognition.

Participation in a range of experiments and investigations will allow students to progressively develop their suite of science inquiry skills while gaining an enhanced appreciation of the variables that affect the quality and quantity of sleep.

Throughout the unit, students develop skills in: planning, conducting and interpreting the results of investigations; synthesising evidence to support conclusions; recognising and defining the realm of validity of psychological theories and models; and communicating these conclusions to others in a range of formats.

2.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

1. describe and explain the role of the brain, cognitive development, and human consciousness and sleep
2. apply understanding of the role of the brain, cognitive development, and human consciousness and sleep
3. analyse evidence about the role of the brain, cognitive development, and human consciousness and sleep
4. interpret evidence about the role of the brain, cognitive development, and human consciousness and sleep
5. investigate phenomena associated with the role of the brain, cognitive development, and human consciousness and sleep
6. evaluate processes, claims and conclusions about the role of the brain, cognitive development, and human consciousness and sleep
7. communicate understandings, findings, arguments and conclusions about the role of the brain, cognitive development, and human consciousness and sleep.

2.3 Topic 1: Psychological science A

In this topic, students will:

Subject matter	Guidance
• distinguish between psychology, psychiatry and social work • explain the philosophical debates within psychology, including free will versus determinism, and nature versus nurture • summarise the steps in the scientific method as used in all psychological research, including – identify the research question – formulate a null hypothesis and an alternative hypothesis – design the method – collect the data – process data, and analyse and evaluate evidence – report the findings.	• **Notional time:** 5 hours • In this topic, the key research skills (Section 1.2.5) should be introduced in summary form through teaching the scientific method. • **Stimulus questions** – What is psychology? – What separates scientific psychology from popular psychology? – Do people make free choices or are their actions determined by forces outside their control? • **Suggested research:** Investigate and summarise the nature-versus-nurture debate (e.g. the case of the mixed-up brothers of Bogota in Dominus 2015).
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Valid and reliable psychological research uses an internationally recognised methodological approach. • Evidence in psychology is open to debate and draws upon multiple individuals across disciplines. • The scientific method encourages reproducibility of psychological research.

2.4 Topic 2: The role of the brain

In this topic, students will:

Subject matter	Guidance
• summarise the mind-versus-body problem, with reference to the Greek physician Claudius Galen and the French philosopher René Descartes • describe early brain investigative techniques including phrenology (Franz Gall in Sabbatini 1997) and brain experiments (Pierre Flourens; Wilder Penfield in Kumar & Yeragani 2011) • explain how neuroimaging techniques can be used to enhance the understanding of brain–behaviour relationships, e.g. – positron emission tomography (PET) – magnetic resonance imaging (MRI) – functional magnetic resonance imaging (fMRI) – electroencephalogram (EEG) • recognise the basic structure and function of the human nervous system, including the central (i.e. brain and spinal cord) and peripheral (i.e. somatic and autonomic) nervous systems • construct a diagram of a neuron, including the axon, dendrites, the cell body and synapse • distinguish between sensory, motor and interneurons • consider that the brain can be divided into a number of discrete areas, including the hindbrain, midbrain and forebrain • understand the role of specific brain regions in localisation of function, including Broca's area, Wernicke's area and Geschwind's territory.	• **Notional time:** 10 hours • In this topic, students should use the key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine the variables to test – design the methodology ▪ distinguish between types of investigations — experiments (control and experimental groups) – comply with ethical guidelines – process data, and analyse and interpret evidence ▪ explain the merit of replicating procedures – communicate scientifically. • **Suggested research:** Review research investigating brain–behaviour relationships in – brain structure (e.g. the case of Phineas Gage in Damasio, Grabowski, Frank et al. 1994) – the developing brain (e.g. the adolescent brain in *Inside the teenage brain* 2002). • **Suggested research:** Review research investigating how neuroimaging can be used to understand brain–behaviour relationships – MRI (in Maguire, Woollett, Spiers 2006) – PET (in Raine, Buchsbaum, LaCasse 1997). • **Syllabus links:** Neuroimaging technologies link to Unit 3 Topic 1: Localisation of function in the brain.

Subject matter	Guidance
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Knowledge about the structure and function of the brain has historically been at the expense of risky and invasive practices. • Neuroimaging techniques have improved neuropsychological knowledge, and understanding of the connections between physiological processes and behaviour. • Understanding localisation of function in the brain can be used to develop projected behavioural impacts when these areas are damaged.

2.5 Topic 3: Cognitive development

In this topic, students will:

Subject matter	Guidance
• understand infancy and adolescence as periods of rapid development and changes in brain structure and function, with reference to myelin, synaptic pruning and the forebrain (frontal lobe) • communicate the nature of neural plasticity with reference to brain development (deprived versus enriched environments) and brain damage • consider timing of experiences on psychological development with reference to sensitive and critical periods • summarise the role of attachment in psychological development with reference to the work of Konrad Lorenz (1937), Harry Harlow (in Harlow & Zimmermann 1958), John Bowlby (1969) and Mary Ainsworth (in Ainsworth, Blehar, Waters & Wall 1978) • understand that early abuse or deprivation can have detrimental effects on cognitive development (Michael Rutter 2004) • discuss cognitive (Jean Piaget 1936), sociocultural (Lev Vygotsky 1978) and information processing theories (i.e. processing speed, cognitive strategies and metacognition) of cognitive development.	• **Notional time:** 15 hours • In this topic, students should use the key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology ▪ distinguish between types of investigations — quasi-experimental designs, observational research designs, correlational research designs – process data, and analyse and interpret evidence ▪ judge the reliability and validity of the experimental process – draw conclusions ▪ draw conclusions consistent with evidence. • **Suggested practical:** Investigate research into the effect technology has had on the cognitive development of adolescents, and conduct a correlational study looking at the relationship between technology use and test performance. • **Suggested research:** Review research investigating – the influence of learning on infant brain development (e.g. the effects of learning in infancy on brain structure and function in Rutgers University 2014) – neuroplasticity in enriched and deprived environments (e.g. brain changes in response to experience in Rosenzweig, Bennet, & Diamond, MC 1972; Hyde, Lerch, Norton, Forgeard, Winner, Evans & Schlaug 2009; Draganski, Gaser, Busch, Schuierer, Bogdahn & May 2004) – attachment and psychological development in infancy (e.g. the significance of secure parent/carer bonds for shy infants in University of Waterloo 2015) – the potential effects of deprivation (e.g. the English and Romanian adoptees study in Rutter, O'Connor & English and Romanian Adoptees (ERA) Study Team 2004) – information processing and metacognition (e.g. the effects of increasing cognitive load in Killeen et al. 2017) – sociocultural theory and cognitive development (e.g. the influence of social

Subject matter	Guidance
	networks in Christakis 2010) • **SHE:** Investigate the impact of increased use of digital technology (e.g. smartphones, tablets, laptops) on children's cognitive development.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Adolescence is a period of rapid brain development that is influenced by biologically defined critical periods, social and cultural contexts. • The use of digital technology has an impact on children's cognitive development. • Psychological scientists adhere to ethical principles when conducting research into the experiences of children who have suffered from abuse or deprivation.

2.6 Topic 4: Human consciousness and sleep

In this topic, students will:

Subject matter	Guidance
• construct a continuum of arousal, from sleep through to hyperarousal • distinguish between selective and divided attention • explain how brain structures (i.e. hypothalamus) and hormones (i.e. melatonin) regulate and direct consciousness • recall the techniques used to measure consciousness, including electroencephalography (EEG), electromyography (EMG), and electrooculography (EOG) • describe the sleep–wake cycle, with reference to the stages of sleep, including rapid eye movement (REM) and non-rapid eye movement (NREM) sleep • describe the purpose of sleep by comparing the restoration and evolutionary theories • summarise the changes in the sleep–wake cycle across the life span, including the sleep-wake shift (in Mary Carskadon 2011) in adolescence • recognise the physical and psychological consequences of total and partial sleep deprivation, including effects on concentration and mood • compare common sleep disorders including narcolepsy, sleep-onset insomnia, sleep apnoea and sleep walking • evaluate treatment interventions for sleep disorders, including cognitive behavioural therapy for insomnia, and bright light therapy for circadian phase disorders. • **Mandatory practical:** Use a correlational research design to conduct an investigation into the relationship between normal hours of sleep and one other variable (e.g. listening to music, food before bed, amount of exercise in the day, reading on electronic devices).	• **Notional time:** 15 hours • **Stimulus questions** – What is consciousness? – How can consciousness be observed? – Why do we sleep? • In this topic, including the mandatory practical, students should use key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology ▪ distinguish between types of investigations — case studies, correlational research designs ▪ identify and use experimental research designs ▪ identify and use appropriate equipment, materials and procedures ▪ minimise extraneous variables and confounding variables – comply with ethical guidelines ▪ appreciate and apply ethical principles – collect the data – process data, and analyse and interpret evidence ▪ distinguish between levels of measurement ▪ present data in visual (e.g. tables) and graphical representations ▪ process and analyse data — inferential statistics: Spearman's rank correlation coefficient ▪ interpret evidence – draw conclusions – communicate scientifically. • **Suggested practicals:** Use an experimental methodology to conduct an investigation into divided attention and memory, replicating the 1996 investigation by Fergus Craik et al (1996).

Subject matter	Guidance
	• **Suggested research:** Review the case study on disc jockey Peter Tripp and explain the physical and psychological effects of sleep deprivation in Thomas Bartlett 2010; *Secrets of sleep deprivation Peter Tripp Pt 1 of 2*; *Secrets of sleep deprivation Peter Tripp Pt 2 of 2*. • **SHE:** Investigate – how consciousness could be an adaptive function (i.e. levels of consciousness as a protective factor — sleeping at night) – changes to sleep patterns across the human lifespan. • **SHE:** Explore research into how sleep deprivation can be used to inform the monitoring, assessment and evaluation of risks in the workforce.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• The nature and quality of sleep has changed in response to different priorities and expectations in today's society. • Understanding the role of sleep in human functioning can be used to develop and evaluate policy and laws. • Sleep serves a different purpose for humans than for animals.

2.7 Assessment guidance

In constructing assessment instruments for Unit 1, schools should ensure that the objectives cover, or are chosen from, the unit objectives. If one assessment instrument is developed for a unit, it must assess all the unit objectives; if more than one assessment instrument is developed, the unit objectives must be covered across those instruments.

It is suggested that student performance on Unit 1 is assessed using techniques modelled on the techniques used in Unit 3:

- a student experiment
- an examination that includes some items modelled on the data test.

3 Unit 2: Individual behaviour

3.1 Unit description

In Unit 2, students explore the ways Psychology explains the development of individual behaviour. They will review the concepts underpinning psychological science. An understanding of theories of intelligence is essential to appreciate the role of nature and nurture in the development of self. Students examine diagnosis of psychological disorder, and investigate the effectiveness of various treatment interventions available to support individuals, families and the community. They develop scientific skills and conceptual understanding of the role that emotion plays in regulating and directing behaviour, and motivation in directing action.

Contexts that could be investigated in this unit include the extremes of intelligence, the use of intelligence tests by business in selecting and profiling employees, the importance of peer review in assessing journal articles and the importance of selecting the most appropriate support interventions for individuals, families and communities where psychological disorder is prevalent.

Participation in a range of experiments and investigations will allow students to progressively develop their suite of science inquiry skills while gaining an enhanced appreciation of theories about the effect of emotion on behaviour.

Throughout the unit, students develop skills in: planning, conducting and interpreting the results of investigations; synthesising evidence to support conclusions; recognising and defining the realm of validity of psychological theories and models; and communicating these conclusions to others in a range of formats.

3.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

1. describe and explain intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation
2. apply understanding of intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation
3. analyse evidence about intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation
4. interpret evidence about intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation
5. investigate phenomena associated with intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation
6. evaluate processes, claims and conclusions about intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation
7. communicate understandings, findings, arguments and conclusions about intelligence, diagnosis, psychological disorders and treatments, and emotion and motivation.

3.3 Topic 1: Psychological science B

In this topic, students will:

Subject matter	Guidance
• recall the distinction between psychology, psychiatry and social work • recall the philosophical debates within psychology, including free will versus determinism, and nature versus nurture • recall the steps in the scientific method used in all psychological research, including – identify the research question – formulate a null hypothesis and an alternative hypothesis – design the method – collect the data – process data, and analyse and evaluate evidence – report the findings.	• **Notional time:** 1 hour

3.4 Topic 2: Intelligence

In this topic, students will:

Subject matter	Guidance
• compare the multiple intelligences (Howard Gardner 2017), information-processing, and emotional intelligence (EQ) theories of intelligence • recognise common methods by which intelligence is assessed with reference to intelligence tests and scales – intelligence quotient (IQ) – Stanford–Binet scale – Wechsler's intelligence scales for adults (WAIS-IV) and children (WISC-IV) • describe whether intelligence tests are valid and reliable • assess the extent intelligence is inherited, with reference to twin, family and adoption studies (e.g. the Minnesota study of twins reared apart in Bouchard, Lykken, McGue, Segal & Tellegen 1990).	• **Notional time:** 10 hours • **Stimulus questions** – What is intelligence? – How is intelligence measured? • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — self-report research designs, interviews ▪ identify and use appropriate equipment, materials and procedures – process data, and analyse and interpret evidence ▪ interpret evidence ▪ explain the merit of replicating procedures. • **Suggested research:** Review research investigating – genes and intelligence (e.g. parent–child studies in Plomin, Fulker, Corley & DeFries 1997) – EQ and life skills (e.g. EQ as a predictor of life skills in Bastian, Burns & Nettelbeck 2005) • **SHE:** Debate the validity and reliability of IQ and EQ testing to determine if these tests can be misleading and/or inaccurate.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Theories of intelligence are applicable within all social and cultural contexts. • The results from intelligence tests are questionable. • Intelligence is an inherited trait.

3.5 Topic 3: Diagnosis

In this topic, students will:

Subject matter	Guidance
• distinguish between adaptive and maladaptive behaviour • summarise concepts of normality, including the sociocultural, functional, historical, situational, medical and statistical approaches • describe psychological disorder • distinguish between diagnostic manuals commonly used for diagnosis, including the *Diagnostic and Statistical Manual of Mental Disorders* (5th edition, 2013), and the *International Classification of Diseases* (10th revision, 2016) • recognise the main categories of psychological disorders, including the schizophrenia spectrum and other psychotic disorders (e.g. schizophrenia), mood disorders (e.g. depression), anxiety disorders (e.g. phobias) and personality disorders (e.g. borderline or antisocial personality disorder) • discuss the reliability and validity of diagnosis.	• **Notional time:** 10 hours • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — interviews, self-report research designs – comply with ethical guidelines ▪ understand the role of ethics committees in approving research – process data, and analyse and interpret evidence ▪ judge the reliability and validity of the experimental process. • **Stimulus questions** – What is normal behaviour? – How has the definition of *normality* changed over time? • **Suggested research:** Review research investigating the validity and reliability of diagnosis in – distinguishing normal and abnormal behaviour (e.g. environments and behavioural contexts in Rosenhan 1973) – the classification and treatment of psychological disorders (e.g. discrepancies across cultures in Cooper, Kendell, Gurland, Sharpe, Copeland & Simon 1972) – mood disorders (e.g. diagnosing depression in primary care settings in Mitchell, Vaze & Rao 2009).
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Diagnostic manuals enable psychologists to offer valid explanations for maladaptive behaviour and make reliable predictions for prognosis. • Diagnosis is influenced by social, cultural and ethical contexts. • Providing a person with a diagnosis can have beneficial and/or harmful and/or unintended consequences.

3.6 Topic 4: Psychological disorders and treatments

In this topic, students will:

Subject matter	Guidance
• describe the biopsychosocial (George Engel 1980) approach to understanding psychological disorder • summarise biological (genes, medication, sleep, substance use); psychological (rumination, impaired reasoning and memory, stress); and social (disorganised attachment, significant relationships) risk factors for psychological disorder • examine the prevalence, symptoms and perceived causes of anxiety disorders, including generalised anxiety disorder (GAD) and specific phobia • describe the impact of stigma on help-seeking behaviours • compare the use of psychotherapies, pharmacotherapies, electroconvulsive therapy (ECT) and psychosurgery in the treatment of psychological disorder • explain the placebo effect.	• **Notional time:** 14 hours • During the teaching of this topic, it is necessary to refer to the 'Safety and ethics' guideline for wellbeing in Section 1.2.4 due to the sensitive nature of the subject matter. • In this topic, students should use key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology ▪ distinguish between types of investigations — self-report research designs – process data, and analyse and interpret evidence ▪ judge the reliability and validity of the experimental process – draw conclusions. • **Suggested practical:** Analyse data identifying the prevalence of psychological disorders in two different cultures. • **Suggested research:** Review research investigating – the relationship between the treatment and prevalence of common psychological disorders (e.g. does increased provision of treatment reduce prevalence? in Jorm, Patten, Brugha & Mojtabai 2017) – the impact of stigma on help-seeking behaviours (e.g. public attitudes about psychological disorders and treatments in Angermeyer, van der Auwera, Carta & Schomerus 2017) • **SHE:** Explore the impact of one psychological disorder on individuals, families and the wider community. • **SHE:** Determine the most appropriate support interventions available to the individual, family and wider community.

Subject matter	Guidance
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• The biopsychosocial approach to explaining psychological disorder encompasses evidence from psychology, psychiatry and social work. • Psychological disorders impact not only individuals, but also families and the wider community. • Appropriate support for people suffering from psychological disorder can alleviate the impacts felt by the individual, their families and the wider community.

3.7 Topic 5: Emotion and motivation

In this topic, students will:

Subject matter	Guidance
• compare the two-factor (Stanley Schachter and Jerome Singer 1962) and appraisal (Richard Lazarus 1982) theories of emotion • **Mandatory practical:** Use an experimental research design to investigate the effect of watching emotive (e.g. a scary movie) versus informative (e.g. an advertisement for toothpaste) stimuli on emotional responses (measured as changes in heart rate). • explain the biological nature of cognitive appraisal, with reference to findings from the 2008 fMRI study by Kevin Ochsner and James Gross • describe factors that influence happiness • assess the degree to which subjective wellbeing (Ed Diener 1984), psychological wellbeing (Carol Ryff 1995), and the broaden-and-build theory (Barbara Fredrickson 2004) influence happiness • explain mindfulness, with reference to attention and acceptance • analyse the positive consequences of the flow experience (Jeanne Nakamura and Mihaly Csikszentmihalyi 2002), with reference to enhancing positive affect, life satisfaction, performance and learning • evaluate the achievement goal (task orientation and ego orientation), cognitive evaluation (intrinsic and extrinsic motivation), and self-efficacy (outcome expectations and efficacy expectations) theories of motivation • describe the role of goal setting in motivation (Edwin Locke et al. 1981).	• **Notional time:** 10 hours • **Stimulus questions** – What motivates you? – How do emotions affect behaviour? • In this topic, including the mandatory practical, students should use key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology – distinguish between types of investigations — experiments (control and experimental groups) – identify and use experimental research designs – identify and use appropriate equipment, materials and procedures – identify and use appropriate sampling procedures for selection and allocation of participants – comply with ethical guidelines ▪ appreciate and apply ethical principles – collect data – process data, and analyse and interpret evidence ▪ present data in visual (e.g. tables) and graphical representations ▪ process and analyse data — descriptive statistics, statistical tests of inference ▪ interpret evidence ▪ judge the reliability and validity of the experimental process – draw conclusions – communicate scientifically. • **Suggested research:** Review research investigating – the appraisal theory of emotion (e.g. the role of physiological reactivity in coping; the significance of fear and anxiety in Herrald & Tomaka 2002;

Subject matter	Guidance
	Ohman, 2000) – the physiology of emotion regulation (e.g. the pathways mediating successful emotion regulation in Wager, Davidson, Hughes et al. 2008). • **Suggested research:** Review research investigating – children's motivation and performance (e.g. the effect of praising children for intelligence in Mueller & Dweck 1998) – happiness (e.g. defining and measuring happiness in Kesebir & Diener 2008). • **Suggested research:** Review research investigating motivation in – cognitive evaluation theory (e.g. motivation in athlete–coach relationships in Blanchard, Amiot, Perreault et al. 2009; Kimball 2007) – goal setting and the prevention of health problems (e.g. the motivational efficacy of technological tracking devices for fitness in Schofield, Mummery, & Schofield 2005). • **SHE:** Explore the relationship between motivation and emotion to gain an appreciation of the importance of conducting research using psychological research methods.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• The focus of psychological research has shifted from psychological disorder to psychological health. • Neuroimaging technologies can show that cognitions have a biological basis. • Evidence from psychological research into flow can influence strategies used by employers to motivate and engage employees.

3.8 Assessment guidance

In constructing assessment instruments for Unit 2, schools should ensure that the objectives cover, or are chosen from, the unit objectives. If one assessment instrument is developed for a unit, it must assess all the unit objectives; if more than one assessment instrument is developed, the unit objectives must be covered across those instruments.

It is suggested that student performance on Unit 2 is assessed using techniques modelled on the techniques used in Unit 4:

- a research investigation
- an examination that includes some items modelled on the data test.

4 Unit 3: Individual thinking

4.1 Unit description

In Unit 3, students explore the ways psychology is used to describe and explain the role of the human nervous system in individual thinking, and the cognitive processes involved in perception, memory, and learning. They will develop an understanding of the structure and function of the human nervous system, including the role of specialised areas of the brain. Understanding the relationships between localised function and specific behaviours is essential to appreciating the impact of interference in the cognitive processes. Students investigate biological, psychological and social influences on visual perception. They also examine models of memory and explore the brain structures responsible for specific aspects of remembering. Students explore three theories of learning, including how fear can be a learnt response.

Contexts that could be investigated in this unit include how damage to areas of the brain can lead to changes in behaviour, the influence of experience and expectations on visual perception, how models of memory can be contested and refined based on new information, and how the media can influence learning.

Participation in a range of experiments and investigations will allow students to progressively develop their suite of science inquiry skills while gaining an enhanced appreciation of environmental effects on memory retrieval.

Throughout the unit, students develop skills in: planning, conducting and interpreting the results of investigations; synthesising evidence to support conclusions; recognising and defining the realm of validity of psychological theories and models; and communicating these conclusions to others in a range of formats.

4.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

Unit objective	IA1	IA2	EA
1. describe and explain localisation of function in the brain, visual perception, memory and learning			•
2. apply understanding of localisation of function in the brain, visual perception, memory and learning	•	•	•
3. analyse evidence about localisation of function in the brain, visual perception, memory and learning	•	•	•
4. interpret evidence about localisation of function in the brain, visual perception, memory and learning	•	•	•
5. investigate phenomena associated with localisation of function in the brain, visual perception, memory and learning		•	
6. evaluate processes, claims and conclusions about localisation of function in the brain, visual perception, memory and learning		•	
7. communicate understandings, findings, arguments and conclusions about localisation of function in the brain, visual perception, memory and learning.		•	

4.3 Topic 1: Localisation of function in the brain

In this topic, students will:

Subject matter	Guidance
• recall the structure of the human nervous system, with reference to the central (i.e. brain and spinal cord) and peripheral (i.e. somatic and autonomic) nervous systems • describe the role of the spinal cord in the human nervous system, with reference to the spinal reflex • recognise that the cerebral cortex can be divided into a number of discrete areas, which have specific functions, including the frontal, occipital, parietal and temporal lobes • recall that language processing occurs within Broca's area, Wernicke's area, and Geschwind's territory • recognise that voluntary movement is coordinated from the primary motor cortex, cerebellum and basal ganglia • recognise that emotion occurs within the limbic system, amygdala and prefrontal cortex • communicate neurotransmission using a diagram • distinguish between excitatory and inhibitory neurotransmitters, with reference to glutamate (Glu) and gamma-amino butyric acid (GABA) • compare the physical and psychological function of acetylcholine, epinephrine, norepinephrine, dopamine and serotonin • discuss the impact of interference in neurotransmitter function, with reference to Parkinson's disease and Alzheimer's disease (symptoms and treatments).	• **Notional time:** 10 hours • In this topic, including the mandatory practical, students should use key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology ▪ distinguish between types of investigations — experiments (control and experimental groups), quasi-experimental designs – comply with ethical guidelines – process data, and analyse and interpret evidence ▪ explain the merit of replicating procedures – communicate scientifically. • **Suggested research:** Review research investigating – treatments for Parkinson's disease (e.g. clinical trials testing dopamine-precursor medications for Parkinson's disease in The Lancet 2014) – treatments for Alzheimer's disease (e.g. the significance of beta-amyloid deposits in Alzheimer's disease in Massachusetts General Hospital 2016). • **Syllabus link:** Localisation of function in the brain links to Unit 1 Topic 2: The role of the brain. • **SHE:** Examine how findings from behavioural neuroscience research can be used by psychologists to offer valid explanations and make reliable predictions for how plasticity assists in the recovery from brain injury.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Ethical guidelines protect the safety and wellbeing of participants within psychological research. • All human behaviour has a biological basis. • Changes to neurotransmitter function may have beneficial and/or harmful and/or unintended consequences.

4.4 Topic 2: Visual perception

In this topic, students will:

Subject matter	Guidance
• explain the process of visual perception, with reference to reception (visible light spectrum); transduction (photoreceptors, receptive fields); transmission (visual cortex); selection (feature detectors); and organisation and interpretation (visual perception principles) • determine biological influences on visual perception, including physiological make-up, ageing and genetics • explain psychological influences on visual perception including: – perceptual set (past experience, context, motivation and emotional state) – visual perception principles (Gestalt, depth cues, and visual constancies) • evaluate the impact of social influences on visual perception, with reference to cultural skills (Hudson 1960; Deregowski 1972; Deregowski, Muldrow & Muldrow 1972) • analyse the fallibility of visual perception, with reference to the Müller-Lyer, Ames room, and Ponzo visual illusions, as well as ambiguous and impossible figures.	• **Notional time:** 10 hours • **Stimulus questions** – What is the difference between sensation and perception? • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — quasi-experimental designs, observational and self-report research designs – process data, and analyse and interpret evidence ▪ interpret evidence ▪ judge the reliability and validity of the experimental process – draw conclusions – communicate scientifically. • **Suggested practical:** Conduct an experiment to investigate the effect of expectation on perceptual set (e.g. the role of frequency in developing perceptual sets in Bugelski & Alampay 1961). • **Suggested research:** Review research investigating – feature detector theory (e.g. sensory processing in the primary visual cortex in Hubel & Wiesel 1979) – the impact of culture on visual perception (e.g. cross-cultural pictorial depth perception in Hudson 1960). • **SHE:** Explore how experience and expectations influence perception, including the concept of perceptual set.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Visual perception can be affected by experience and expectations. • Psychological research into visual perception can offer valid explanations for cultural differences in interpreting stimuli. • Visual illusions demonstrate the fallibility of visual perception.

4.5 Topic 3: Memory

In this topic, students will:

Subject matter	Guidance
• recognise the duration and capacity of sensory memory (including iconic and echoic), and short-term and long-term memory • evaluate two models of memory, including – the working model of memory (Alan Baddeley and Graham Hitch 1974), including the central executive, phonological loop, visuospatial sketchpad, and episodic buffer – the levels of processing (LOP) model of memory, including the role of encoding in long-term memory • explain how information is stored in long-term memory with reference to implicit (procedural) and explicit (episodic and semantic) memory • describe the role of the hippocampus in memory formation and storage • consider the role of the cerebellum in forming and storing implicit (procedural) memories • distinguish between recall, recognition and relearning • describe how information is lost from memory through encoding failure, retrieval failure and interference effects • discuss strategies to improve memory, including chunking, rehearsal (maintenance and elaborative) and mnemonics (e.g. the method of loci and SQ4R method — survey, question, read, recite, relate, and review). • **Mandatory practical:** Use an experimental research design to investigate the effect of learning environment on memory, replicating aspects of the 1998 investigation by Harry Grant et al.	• **Notional time:** 15 hours • **Stimulus questions** – What is memory? – How are memories formed? – How are memories retrieved? • In this topic, including the mandatory practical, students should use key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — experiments (control and experimental groups) ▪ identify and use experimental research designs ▪ identify and use appropriate equipment, materials and procedures ▪ identify and use appropriate sampling procedures for selection and allocation of participants – comply with ethical guidelines ▪ appreciate and apply ethical principles – collect data – process data, and analyse and interpret evidence ▪ present data in visual (e.g. tables) and graphical representations ▪ process and analyse data — descriptive statistics, statistical tests of inference ▪ interpret evidence ▪ judge the reliability and validity of the experimental process – draw conclusions – communicate scientifically. • **Suggested research:** Review research investigating the role of the

Subject matter	Guidance
	hippocampus in memory (e.g. the result of damage to the hippocampus in Corkin, Amaral, Gonzalez, Johnson & Hyman 1997). • **Suggested practical:** Modify an experiment investigating memory, such as – duration of short-term memory (Peterson & Peterson 1959) – the capacity of short-term memory (Miller 1956) – encoding in memory (Craik & Levy 1970) – context-dependent cues on memory (Tulving & Pearlstone 1966) – levels of processing theory ▪ deep processing (semantic) (Elias & Perfetti 1973) ▪ deep and shallow processing (semantic, physical and phonemic) (Hyde & Jenkins 1973) ▪ evaluating the validity of depth of processing (Craik & Tulving 1975). • **SHE:** Explore cases of when models of memory have been contested and/or refined and/or replaced as a result of new evidence challenging them.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Investigations into memory can be limited in their ability to provide definitive answers as the evidence is open to interpretation. • The working model of memory has greater explanatory power than previous models of memory. • Changes to memory occur in response to ageing.

4.6 Topic 4: Learning

In this topic, students will:

Subject matter	Guidance
• compare classical conditioning (Ivan Pavlov 1897/1902), operant conditioning (BF Skinner 1948) and social learning theory (Albert Bandura 1977) • for classical conditioning – recall the unconditioned stimulus (UCS), unconditioned response (UCR), neutral stimulus (NS), conditioned stimulus (CS) and conditioned response (CR) – distinguish between stimulus generalisation and discrimination – describe extinction and spontaneous recovery – describe learned fear responses (John Watson — the 'Little Albert' experiment) (Watson & Rayner 1920) • for operant conditioning – distinguish between negative and positive reinforcement and punishment – describe stimulus generalisation and discrimination – describe extinction and spontaneous recovery • for social learning theory – distinguish between modelling and vicarious conditioning.	• **Notional time:** 10 hours • **Stimulus questions** – How do we learn? – What makes certain behaviours occur more or less often? • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — experiments, observational research designs – comply with ethical guidelines – process data, and analyse and interpret evidence ▪ interpret evidence ▪ judge the reliability and validity of the experimental process ▪ explain the merit of replicating procedures – draw conclusions – communicate scientifically. • **SHE:** Investigate – instances of conditioned immune responses in humans – the impact of role models (music, film, television) on teenage behaviour. • **SHE:** Explore how social media influences behaviour through the application of social learning theory.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Learning theories explain how behaviour is influenced by social and/or cultural contexts. • Theories for learning have been contested and refined with the emergence of new psychological research. • Learning theories are limited in their ability to provide definitive answers as they do not consider the biological nature of learning.

4.7 Assessment

4.7.1 Summative internal assessment 1 (IA1): Data test (10%)

Description

This assessment focuses on the application of a range of cognitions to multiple provided items.

Student responses must be completed individually, under supervised conditions, and in a set timeframe.

Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

2. apply understanding of localisation of function in the brain, visual perception, memory, or learning to given algebraic, visual or graphical representations of scientific relationships and data to determine unknown scientific quantities or features
3. analyse evidence about localisation of function in the brain, visual perception, memory, or learning to identify trends, patterns, relationships, limitations or uncertainty in datasets
4. interpret evidence about localisation of function in the brain, visual perception, memory, or learning to draw conclusions based on analysis of datasets.

Note: Objectives 1, 5, 6 and 7 are not assessed in this instrument.

Specifications

Description

Students respond to items using qualitative data and/or quantitative data derived from the mandatory or suggested practicals, activities or case studies from the unit being studied.

The data test contains two to four datasets and consists of a number of different types of items, which include:

- short response items requiring single-word, sentence or short paragraph responses
- calculating using algorithms
- interpreting datasets.

Mark allocations

Percentage of marks	Objective	Cognition and nature of response
~ 30%	2. apply understanding of localisation of function in the brain, visual perception, memory, or learning to given algebraic, visual or graphical representations of scientific relationships and data to determine unknown scientific quantities or features	Students calculate, identify, recognise and use evidence to determine unknown scientific quantities or features.
~ 30%	3. analyse evidence about localisation of function in the brain, visual perception, memory, or learning to identify trends, patterns, relationships, limitations or uncertainty in datasets	Students categorise, classify, contrast, distinguish, organise or sequence evidence to identify trends, patterns, relationships, limitations or uncertainty in datasets.
~ 40%	4. interpret evidence about localisation of function in the brain, visual perception, memory, or learning to draw conclusions based on analysis of datasets.	Students compare, deduce extrapolate, infer, justify or predict using evidence to draw conclusions based on analysis of the datasets.

Conditions

- Time: 60 minutes plus 10 minutes perusal.
- Length: up to 500 words in total, consisting of
  - short responses, i.e. single words, sentences or short paragraphs (fewer than 50 words)
  - paragraphs, 50–250 words per item
  - other types of item responses (e.g. interpreting and calculating) should allow students to complete the response in the set time.
- Other:
  - QCAA-approved graphics calculator permitted
  - unseen stimulus.

Summary of the instrument-specific marking guide

The following table summarises the criteria, assessment objectives and mark allocation for the data test.

Criterion	Objectives	Marks
Data test	2, 3, 4	10
Total		**10**

Note: Unit objectives 1, 5, 6 and 7 are not assessed in this instrument.

Instrument-specific marking guide

Criterion: Data test

Assessment objectives

2. apply understanding of localisation of function in the brain, visual perception, memory, or learning to given algebraic, visual or graphical representations of scientific relationships and data to determine unknown scientific quantities or features
3. analyse evidence about localisation of function in the brain, visual perception, memory, or learning to identify trends, patterns, relationships, limitations or uncertainty in datasets
4. interpret evidence about localisation of function in the brain, visual perception, memory, or learning to draw conclusions based on analysis of datasets

The student work has the following characteristics:	Cut-off	Marks
• consistent demonstration, across a range of scenarios about localisation of function in the brain, visual perception, memory, or learning, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual and graphical representations of scientific relationships and data – correct and appropriate use of analytical techniques to correctly identify trends, patterns, relationships, limitations and uncertainty – correct interpretation of evidence to draw valid conclusions.	> 90%	10
	> 80%	9
• consistent demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual and graphical representations of scientific relationships and data – correct use of analytical techniques to correctly identify trends, patterns, relationships, limitations and uncertainty – correct interpretation of evidence to draw valid conclusions.	> 70%	8
	> 60%	7
• adequate demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual and graphical representations of scientific relationships and data – correct use of analytical techniques to correctly identify trends, patterns, relationships, limitations and uncertainty – correct interpretation of evidence to draw valid conclusions.	> 50%	6
	> 40%	5

The student work has the following characteristics:	Cut-off	Marks
• demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of elements, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual or graphical representations of scientific relationships or data – correct use of analytical techniques to correctly identify trends, patterns, relationships, limitations or uncertainty – correct interpretation of evidence to draw valid conclusions.	> 30%	4
	> 20%	3
• demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of elements of – application of scientific concepts, theories, models or systems to predict outcomes, behaviours or implications – calculation of quantities through the use of algebraic or graphical representations of scientific relationships and data – use of analytical techniques to identify trends, patterns, relationships, limitations or uncertainty – interpretation of evidence to draw conclusions.	> 10%	2
	> 1%	1
• does not satisfy any of the descriptors above.	≤ 1%	0

4.7.2 Summative internal assessment 2 (IA2): Student experiment (20%)

Description

This assessment requires students to research a question or hypothesis through collection, analysis and synthesis of primary data. A student experiment uses investigative practices to assess a range of cognitions in a particular context. Investigative practices include locating and using information beyond students' own knowledge and the data they have been given.

Research conventions must be adhered to. This assessment occurs over an extended and defined period of time. Students may use class time and their own time to develop a response.

Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

2. apply understanding of localisation of function in the brain, visual perception, memory or learning to modify experimental methodologies and process primary data
3. analyse experimental evidence about localisation of function in the brain, visual perception, memory or learning
4. interpret experimental evidence about localisation of function in the brain, visual perception, memory or learning
5. investigate phenomena associated with localisation of function in the brain, visual perception, memory or learning through an experiment
6. evaluate experimental processes and conclusions about localisation of function in the brain, visual perception, memory or learning
7. communicate understandings and experimental findings, arguments and conclusions about localisation of function in the brain, visual perception, memory or learning.

Note: Objective 1 is not assessed in this instrument.

Specifications

Description

In the student experiment, students modify (i.e. refine, extend or redirect) an experiment in order to address their own related hypothesis or question. It is sufficient that students use a practical performed in class or a simulation as the basis for their methodology and research question.

In order to complete the assessment task, students must:

- identify an experiment to modify*
- develop a research question to be investigated*
- research relevant background scientific information to inform the modification of the research question and methodology
- conduct a risk assessment and account for risks in the methodology*
- conduct the experiment*
- collect sufficient and relevant qualitative data and/or quantitative data to address the research question*
- process and present the data appropriately

- analyse the evidence to identify trends, patterns or relationships
- analyse the evidence to identify uncertainty and limitations
- interpret the evidence to draw conclusion/s to the research question
- evaluate the reliability and validity of the experimental process
- suggest possible improvements and extensions to the experiment
- communicate findings in an appropriate scientific genre (e.g. report, poster presentation, journal article, conference presentation).

*The steps indicated with an asterisk above may be completed in groups. All other elements must be completed individually.

Scientific inquiry is a non-linear, iterative process. Students will not necessarily complete these steps in the stated order; some steps may be repeated or revisited.

Conditions

- Time: 10 hours class time. This time will not necessarily be sequential. Students must perform the majority of the task during class time, including
  - performing background research and developing the methodology
  - conducting the experiment
  - processing and analysing evidence and evaluating the methodology
  - preparing and presenting the response (e.g. writing the scientific report, constructing and presenting the scientific poster).
- Length:
  - written (e.g. scientific report), 1500–2000 words

  or
  - multimodal presentation (e.g. scientific poster presentation), 9–11 minutes.
- Other:
  - students may work collaboratively with other students to develop the methodology and perform the experiment; all other stages (e.g. processing of data, analysis of evidence and evaluation of the experimental process) must be carried out individually
  - the response must be presented using an appropriate scientific genre (e.g. report, poster presentation, journal article, conference presentation) and contain
    - a research question
    - a rationale for the experiment
    - reference to the initial experiment and identification and justification of modifications to the methodology
    - raw and processed qualitative data and/or quantitative data
    - analysis of the evidence
    - conclusion/s based on the interpretation of the evidence

- evaluation of the methodology and suggestions of improvements and extensions to the experiment
- a reference list.

Summary of the instrument-specific marking guide

The following table summarises the criteria, assessment objectives and mark allocation for the student experiment.

Criterion	Objectives	Marks
Research and planning	2, 5	6
Analysis of evidence	2, 3, 5	6
Interpretation and evaluation	4, 6	6
Communication	7	2
Total		**20**

Note: Unit objective 1 is not assessed in this instrument.

Instrument-specific marking guide

Criterion: Research and planning

Assessment objectives

2. apply understanding of localisation of function in the brain, visual perception, memory or learning to modify experimental methodologies and process primary data
5. investigate phenomena associated with localisation of function in the brain, visual perception, memory or learning through an experiment

The student work has the following characteristics:	Marks
• informed application of understanding of localisation of function in the brain, visual perception, memory or learning to modify experimental methodologies demonstrated by – a considered rationale for the experiment – justified modifications to the methodology • effective and efficient investigation of phenomena associated with localisation of function in the brain, visual perception, memory or learning demonstrated by – a specific and relevant research question – a methodology that enables the collection of sufficient, relevant data – considered management of risks and ethical or environmental issues.	5–6
• adequate application of understanding of localisation of function in the brain, visual perception, memory or learning to modify experimental methodologies demonstrated by – a reasonable rationale for the experiment – feasible modifications to the methodology • effective investigation of phenomena associated with localisation of function in the brain, visual perception, memory or learning demonstrated by – a relevant research question – a methodology that enables the collection of relevant data – management of risks and ethical or environmental issues.	3–4
• rudimentary application of understanding of localisation of function in the brain, visual perception, memory or learning to modify experimental methodologies demonstrated by – a vague or irrelevant rationale for the experiment – inappropriate modifications to the methodology • ineffective investigation of phenomena associated with localisation of function in the brain, visual perception, memory or learning demonstrated by – an inappropriate research question – a methodology that causes the collection of insufficient and irrelevant data – inadequate management of risks and ethical or environmental issues.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Analysis of evidence

Assessment objectives

2. apply understanding of localisation of function in the brain, visual perception, memory or learning to modify experimental methodologies and process primary data
3. analyse experimental evidence about localisation of function in the brain, visual perception, memory or learning
5. investigate phenomena associated with localisation of function in the brain, visual perception, memory or learning through an experiment

The student work has the following characteristics:	Marks
• appropriate application of algorithms, visual and graphical representations of data about localisation of function in the brain, visual perception, memory or learning demonstrated by correct and relevant processing of data • systematic and effective analysis of experimental evidence about localisation of function in the brain, visual perception, memory or learning demonstrated by – thorough identification of relevant trends, patterns or relationships – thorough and appropriate identification of the uncertainty and limitations of evidence • effective and efficient investigation of phenomena associated with localisation of function in the brain, visual perception, memory or learning demonstrated by the collection of sufficient and relevant raw data.	5–6
• adequate application of algorithms, visual and graphical representations of data about localisation of function in the brain, visual perception, memory or learning demonstrated by basic processing of data • effective analysis of experimental evidence about localisation of function in the brain, visual perception, memory or learning demonstrated by – identification of obvious trends, patterns or relationships – basic identification of uncertainty and limitations of evidence • effective investigation of phenomena associated with localisation of function in the brain, visual perception, memory or learning demonstrated by the collection of relevant raw data.	3–4
• rudimentary application of algorithms, visual and graphical representations of data about localisation of function in the brain, visual perception, memory or learning demonstrated by incorrect or irrelevant processing of data • ineffective analysis of experimental evidence about localisation of function in the brain, visual perception, memory or learning demonstrated by – identification of incorrect or irrelevant trends, patterns or relationships – incorrect or insufficient identification of uncertainty and limitations of evidence • ineffective investigation of phenomena associated with localisation of function in the brain, visual perception, memory or learning demonstrated by the collection of insufficient and irrelevant raw data.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Interpretation and evaluation

Assessment objectives

4. interpret experimental evidence about localisation of function in the brain, visual perception, memory or learning
6. evaluate experimental processes and conclusions about localisation of function in the brain, visual perception, memory or learning

The student work has the following characteristics:	Marks
• insightful interpretation of experimental evidence about localisation of function in the brain, visual perception, memory or learning demonstrated by justified conclusion/s linked to the research question • critical evaluation of experimental processes about localisation of function in the brain, visual perception, memory or learning demonstrated by – justified discussion of the reliability and validity of the experimental process – suggested improvements and extensions to the experiment that are logically derived from the analysis of evidence.	5–6
• adequate interpretation of experimental evidence about localisation of function in the brain, visual perception, memory or learning demonstrated by reasonable conclusion/s relevant to the research question • basic evaluation of experimental processes about localisation of function in the brain, visual perception, memory or learning demonstrated by – reasonable description of the reliability and validity of the experimental process – suggested improvements and extensions to the experiment that are related to the analysis of evidence.	3–4
• invalid interpretation of experimental evidence about localisation of function in the brain, visual perception, memory or learning demonstrated by identifying inappropriate or irrelevant conclusion/s • superficial evaluation of experimental processes about localisation of function in the brain, visual perception, memory or learning demonstrated by – cursory or simplistic statements about the reliability and validity of the experimental process – ineffective or irrelevant suggestions.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Communication

Assessment objective

7. communicate understandings and experimental findings, arguments and conclusions about localisation of function in the brain, visual perception, memory or learning

The student work has the following characteristics:	Marks
• effective communication of understandings and experimental findings, arguments and conclusions about localisation of function in the brain, visual perception, memory or learning demonstrated by – fluent and concise use of scientific language and representations – appropriate use of genre conventions – acknowledgment of sources of information through appropriate use of referencing conventions.	2
• adequate communication of understandings and experimental findings, arguments and conclusions about localisation of function in the brain, visual perception, memory or learning demonstrated by – competent use of scientific language and representations – use of basic genre conventions – use of basic referencing conventions.	1
• does not satisfy any of the descriptors above.	0

4.7.3 Summative external assessment (EA): Examination (50%)

General information

Summative external assessment is developed and marked by the QCAA. In Psychology it contributes 50% to a student's overall subject result.

Summative external assessment assesses learning from both Units 3 and 4.

The external assessment in Psychology is common to all schools and administered under the same conditions, at the same time, on the same day.

See Section 5.7.2.

5 Unit 4: The influence of others

5.1 Unit description

In Unit 4, students explore the ways Psychology is used to describe and explain how others influence our development, behaviour and thinking. An understanding of the social processes involved in the development of relationships is essential to appreciating the responses and actions of others. Students investigate how stereotypes can directly affect behaviour. They examine how attitudes are formed and challenged, and analyse the complex cross-cultural nature of societies today.

Contexts that could be investigated in this unit include how the presence of others affects how we think, feel and behave; the impact that developing information communication technologies have on large-scale datasets; and the challenges faced with ever-increasing migrations of people in creating intercommunity and intercultural understanding.

Participation in a range of experiments and investigations will allow students to progressively develop their suite of science inquiry skills while gaining an enhanced appreciation of the impact of stereotypes on behaviour, and how easy it is to commit the fundamental attribution error (FAE).

Throughout the unit, students develop skills in: planning, conducting and interpreting the results of investigations; synthesising evidence to support conclusions; recognising and defining the realm of validity of psychological theories and models; and communicating these conclusions to others in a range of formats.

5.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

Unit objective	IA3	EA
1. describe and explain social psychology, interpersonal processes, attitudes and cross-cultural psychology		•
2. apply understanding of social psychology, interpersonal processes, attitudes and cross-cultural psychology	•	•
3. analyse evidence about social psychology, interpersonal processes, attitudes and cross-cultural psychology	•	•
4. interpret evidence about social psychology, interpersonal processes, attitudes and cross-cultural psychology	•	•
5. investigate phenomena associated with social psychology, interpersonal processes, attitudes and cross-cultural psychology	•	
6. evaluate processes, claims and conclusions about social psychology, interpersonal processes, attitudes and cross-cultural psychology	•	
7. communicate understandings, findings, arguments and conclusions about social psychology, interpersonal processes, attitudes and cross-cultural psychology.	•	

5.3 Topic 1: Social psychology

In this topic, students will:

Subject matter	Guidance
• explain the difference between primary (family) and secondary (media, schooling) socialisation • describe gender and compare social learning, cognitive developmental and biology-based theories of gender role formation • describe group social influence, with reference to compliance, identification and internalisation • deduce how status and power operate in groups, with reference to the Stanford Prison experiment (Haney, Banks & Zimbardo 1973) • predict how obedience, conformity and social norms (Robert Cialdini et al. 2006) lead to behaviour change • evaluate historical social psychological research, with reference to studies conducted by Stanley Milgram (1963) and Solomon Asch (1951).	• **Notional time:** 10 hours • **Stimulus questions** – How do others affect our behaviour? – How easy is it to replicate social psychology experiments today? • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — experiments, observational research designs – comply with ethical guidelines – process data, and analyse and interpret evidence ▪ interpret evidence ▪ judge the reliability and validity of the experimental process ▪ explain the merit of replicating procedures – draw conclusions – communicate scientifically. • To introduce gender role formation, read 'X: A fabulous child's story' (Lois Gould 1983). • **Suggested research:** Review research investigating – obedience (e.g. the 'Shock the puppy' experiment in Sheridan & King 1972) – obedience and the authority gradient (e.g. the 'Hospital' experiment in Holfing et al. 1966) – the influence of social media in adolescent–peer relationships (e.g. identity formation, behaviours and relationships in Wood, Bukowski & Lis 2016). • **SHE:** The nature of relationships during adolescence is changing due to social media.

Subject matter	Guidance
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• The presence of others affects the way we think, feel and behave. • Social media is changing the nature of relationships experienced by adolescents. • Adherence to ethical principles has decreased the application of psychological research to behaviour in the real world.

5.4 Topic 2: Interpersonal processes

In this topic, students will:

Subject matter	Guidance
• analyse Bibb Darley and John Latane's (1968) model of bystander intervention • describe social factors that influence prosocial behaviour, with reference to the reciprocity principle and social responsibility • describe personal characteristics that influence prosocial behaviour, with reference to empathy, mood, competence and altruism • consider factors that influence antisocial behaviour, including groupthink, diffusion of responsibility, audience inhibition, social influence and cost–benefit analysis • discuss the general aggression model (GAM) • explain how media can influence aggression, with reference to advertising, video games and social media • describe biological theories of attraction (Buss, Abbott, Angleitner, Asherian, Biaggio et al. 1990) • recognise social and cognitive origins of attraction, including proximity, reciprocity and similarity • predict why relationships change and end, with reference to Duck's stages of dissolution (i.e. intrapsychic stage, dyadic stage, social stage, grave-dressing stage and resurrection stage) (Stephanie Rollie and Steve Duck 2006).	• **Notional time:** 15 hours • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — quasi-experimental designs, case studies – comply with ethical guidelines – process data, and analyse and interpret evidence ▪ interpret evidence ▪ judge the reliability and validity of the experimental process ▪ explain the merit of replicating procedures – draw conclusions – communicate scientifically. • **Suggested research:** Review the case study of Kitty Genovese (Gainsburg 1964) demonstrating Darley and Latane's (1968) model of bystander intervention. • **Suggested research:** Review research investigating relationships in – cross-cultural altruism (e.g. kin selection in UK and South African students in Madsen, Tunney, Fieldman et al. 2007) – temperature and aggression (e.g. hot temperatures, hostile affect, and hostile cognition, and arousal in Anderson, Deuser & DeNeve 1995) – biological attraction theories (e.g. partner selection based on genes expressed through body odour in Wedekind et al. 1995) – social and cognitive origins of attraction (e.g. the similarity-attraction hypothesis in Markey & Markey 2007) – relationship dissolution and media influence (e.g. navigating romantic relationships in social media in LeFebve, Blackburn & Brody 2014) – attraction, relationship satisfaction and relationship dissolution (e.g. correlation between heterosexual and homosexual relationship satisfaction and stability in Gottman, Levenson, Gross, Fredrickson, McCoy,

Subject matter	Guidance
	Rosenthal, Ruef & Yoshimoto 2003). • **SHE:** Investigate how ICTs have dramatically increased the size, accuracy and geographic and temporal scope of datasets pertaining to group mentality.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Psychology is limited in its ability to provide definitive solutions to the harmful expression of antisocial behaviour seen within societies. • The general aggression model (GAM) is the best explanation of aggression because it encompasses evidence from multiple theories across multiple perspectives. • The formation of relationships is influenced by cultural norms and expectations.

5.5 Topic 3: Attitudes

In this topic, students will:

Subject matter	Guidance
• describe implicit and explicit attitudes • predict how discrepancies between attitudes and behaviours can lead to cognitive dissonance (Leon Festinger 1957) • evaluate social identity theory (Henry Tajfel 1970), with reference to social categorisation, social identification and social comparison • describe attributions, and recognise how attributions are used to explain behaviour, with reference to situational and dispositional attributions, and the fundamental attribution error (Lee Ross et al. 1977) • contrast self-serving and confirmation biases • describe stereotypes using the tri-component model of attitudes • distinguish between prejudice and discrimination • describe scapegoating, direct experience, personal and group prejudice and the prejudiced personality • prejudice can be on the basis of social differences; describe prejudice expressed as sexism and ageism. • **Mandatory practical:** Use a correlational research design to investigate the relationship between stereotypes and behaviour by replicating the 1996 investigation by John Bargh, Mark Chen and Lara Burrows (Experiment 2).	• Notional time: 10 hours • **Stimulus questions** – How are attitudes formed? – How are attitudes communicated? • In this topic, students should use key research skills (Section 1.2.5) to – define the research question, state the hypotheses and determine variables to test – design the methodology ▪ distinguish between types of investigations — correlational research designs ▪ identify and use experimental research designs ▪ identify and use appropriate equipment, materials and procedures ▪ minimise extraneous variables and confounding variables – comply with ethical guidelines ▪ appreciate and apply ethical principles – collect the data – analyse, evaluate and interpret data ▪ distinguish between levels of measurement ▪ present data in visual (e.g. tables) and graphical representations ▪ process and analyse data — correlation ▪ interpret evidence – draw conclusions – communicate scientifically. • **Suggested research:** Review research investigating cognitive dissonance in – forced compliance (Festinger & Carlsmith 1959) – decision-making (Brehm & Cohen 1956) – the significance of effort (Aronson & Mills 1959) • **Suggested research:** Review research investigating social identity theory in – discrimination (e.g.'A Class Divided' 1968 experiment by Jane Elliott in *A*

Subject matter	Guidance
	Class Divided: Introduction 2003) – group prejudice (e.g. 'The Robbers Cave' 1954, 1958 and 1961 experiments by Muzafer Sherif). • **SHE:** Explore how attribution is used to explain behaviour of others and can lead to the fundamental attribution error.
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• Attributions influence our interpretation of an action performed by another, and how we respond to it. • Bias may have beneficial and/or harmful and/or unintended consequences on behaviour. • The acceptance of stereotypical, prejudiced and/or discriminatory attitudes is influenced by social, economic, cultural and ethical contexts.

5.6 Topic 4: Cross-cultural psychology

In this topic, students will:

Subject matter	Guidance
• describe how membership, influence, integration and the fulfilment of needs, and shared emotional connection lead to a sense of community (David McMillan and David Chavis 1986) • consider what is meant by *culture* • distinguish between multiculturalism and pluralism • examine the psychological challenges of immigration, including culture shock, acculturation and assimilation • consider how cultural diversity can sometimes be a source of conflict, with reference to prejudice expressed as racism (implicit and explicit) • describe ways to reduce prejudice, with reference to intergroup contact, sustained contact, superordinate goals, mutual interdependence and equality (equal-status contact).	• **Notional time:** 10 hours • During the teaching of this topic, it is necessary to refer to the 'Safety and ethics' guideline for wellbeing in Section 1.2.4 due to the sensitive nature of the subject matter. • In this topic, students should use key research skills (Section 1.2.5) to – design the methodology ▪ access and synthesise relevant secondary sources ▪ distinguish between types of investigations — interviews, self-report research designs – comply with ethical guidelines – process data, and analyse and interpret evidence ▪ interpret evidence ▪ judge the reliability and validity of the experimental process ▪ explain the merit of replicating procedures – draw conclusions – communicate scientifically. • **Suggested practical:** Conduct a quasi-experimental investigation into conversational distance and one other variable. • **Suggested research:** Review research investigating – prejudice reduction through intergroup contact (e.g. racial bias in neural response to others' pain in Cao, Contreras-Huerta, McFadyen & Cunnington 2015) – cultural diversity and implicit instructions (e.g. emotional display rules in Matsumoto 2007) – prejudice displayed as racism (e.g. racism in Australia in Dunn 2004) • **SHE:** Explore ways to increase intercultural understanding in order to reduce conflict as a result of cultural diversity.

Subject matter	Guidance
Science as a Human Endeavour • SHE subject matter will not be assessed on the external examination but could be used in the development of claims and research questions for a research investigation.	• International collaboration is required when investigating cross-cultural phenomena. • Advances in research investigating the impact of cultural diversity on societies, can influence social policy and government decision-making. • Conflict, as a result of cultural diversity, can be alleviated by increasing intercultural understanding.

5.7 Assessment

5.7.1 Summative internal assessment 3 (IA3): Research investigation (20%)

Description

This assessment requires students to evaluate a claim. They will do this by researching, analysing and interpreting secondary evidence from scientific texts to form the basis for a justified conclusion about the claim. A research investigation uses research practices to assess a range of cognitions in a particular context. Research practices include locating and using information beyond students' own knowledge and the data they have been given.

Research conventions must be adhered to. This assessment occurs over an extended and defined period of time. Students may use class time and their own time to develop a response.

Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

2. apply understanding of social psychology, interpersonal processes, attitudes or cross-cultural psychology to develop research questions
3. analyse research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology
4. interpret research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology
5. investigate phenomena associated with social psychology, interpersonal processes, attitudes or cross-cultural psychology through research
6. evaluate research processes, claims and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology
7. communicate understandings and research findings, arguments and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology.

Note: Objective 1 is not assessed in this instrument.

Specifications

Description

In the research investigation, students gather secondary evidence related to a research question in order to evaluate the claim. The students develop their research question based on a number of possible claims provided by their teacher. Students work individually throughout this task.

Evidence must be obtained by researching scientifically credible sources, such as scientific journals, books by well-credentialed scientists and websites of governments, universities, independent research bodies or science and technology manufacturers.

In order to complete the assessment task, students must:

- select a claim to be evaluated
- identify the relevant scientific concepts associated with the claim
- pose a research question addressing an aspect of the claim

- conduct research to gather scientific evidence that may be used to address the research question and subsequently evaluate the claim
- analyse the data to identify sufficient and relevant evidence
- identify the trends, patterns or relationships in the evidence
- analyse the evidence to identify limitations
- interpret the evidence to construct justified scientific arguments
- interpret the evidence to form a justified conclusion to the research question
- discuss the quality of the evidence
- evaluate the claim by extrapolating the findings of the research question to the claim
- suggest improvements and extensions to the investigation
- communicate findings in an appropriate scientific genre (e.g.report, journal article, essay, conference presentation).

Scientific inquiry is a non-linear, iterative process. Students will not necessarily complete these steps in the stated order; some steps may be repeated or revisited.

Conditions

- Time: 10 hours class time. This time will not necessarily be sequential. Students must perform the majority of the task during class time, including
  - performing background research
  - developing the research question
  - collecting scientific evidence
  - analysing and interpreting evidence and evaluating the claim
  - preparing and presenting the response (e.g. writing the scientific essay).
- Length:
  - written (e.g. scientific essay), 1500–2000 words

  or
  - multimodal presentation (e.g. scientific conference presentation), 9–11 minutes.
- Other:
  - students are to work individually throughout this task
  - the response must be presented using an appropriate scientific genre (e.g. report, journal article, essay, conference presentation) and contain
    - a claim
    - a research question
    - a rationale for the investigation
    - justified scientific arguments using evidence
    - a conclusion to the research question based on the interpretation of the evidence
    - evaluation of the claim and suggestions of improvements and extensions to the investigation
    - a reference list.

Summary of the instrument-specific marking guide

The following table summarises the criteria, assessment objectives and mark allocation for the research investigation.

Criterion	Objectives	Marks
Research and planning	2, 5	6
Analysis and interpretation	3, 4	6
Conclusion and evaluation	4, 6	6
Communication	7	2
Total		**20**

Note: Unit objective 1 is not assessed in this instrument.

Instrument-specific marking guide

Criterion: Research and planning

Assessment objectives

2. apply understanding of social psychology, interpersonal processes, attitudes or cross-cultural psychology to develop research questions
5. investigate phenomena associated with social psychology, interpersonal processes, attitudes or cross-cultural psychology through research

The student work has the following characteristics:	Marks
• informed application of understanding of social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by a considered rationale identifying clear development of the research question from the claim • effective and efficient investigation of phenomena associated with social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – a specific and relevant research question – selection of sufficient and relevant sources.	5–6
• adequate application of understanding of social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by a reasonable rationale that links the research question and the claim • effective investigation of phenomena associated with social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – a relevant research question – selection of relevant sources.	3–4
• rudimentary application of understanding of social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by a vague or irrelevant rationale for the investigation • ineffective investigation of phenomena associated with social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – an inappropriate research question – selection of insufficient and irrelevant sources.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Analysis and interpretation

Assessment objectives

3. analyse research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology
4. interpret research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology

The student work has the following characteristics:	Marks
• systematic and effective analysis of qualitative data and/or quantitative data within the sources about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – the identification of sufficient and relevant evidence – thorough identification of relevant trends, patterns or relationships – thorough and appropriate identification of limitations of evidence • insightful interpretation of research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by justified scientific argument/s.	5–6
• effective analysis of qualitative data and/or quantitative data within the sources about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – the identification of relevant evidence – identification of obvious trends, patterns or relationships – basic identification of limitations of evidence • adequate interpretation of research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by reasonable scientific argument/s.	3–4
• rudimentary analysis of qualitative data and/or quantitative data within the sources about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – the identification of insufficient and irrelevant evidence – identification of incorrect or irrelevant trends, patterns or relationships – incorrect or insufficient identification of limitations of evidence • invalid interpretation of research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by inappropriate or irrelevant argument/s.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Conclusion and evaluation

Assessment objectives

4. interpret research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology
6. evaluate research processes, claims and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology

The student work has the following characteristics:	Marks
• insightful interpretation of research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by justified conclusion/s linked to the research question • critical evaluation of the research processes, claims and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – insightful discussion of the quality of evidence – extrapolation of credible findings of the research to the claim – suggested improvements and extensions to the investigation that are considered and relevant to the claim.	5–6
• adequate interpretation of research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by reasonable conclusion/s relevant to the research question • basic evaluation of the research processes, claims and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – reasonable description of the quality of evidence – application of relevant findings of the research to the claim – suggested improvements and extensions to the investigation that are relevant to the claim.	3–4
• invalid interpretation of research evidence about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by inappropriate or irrelevant conclusion/s • superficial evaluation of the research processes, claims and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – cursory or simplistic statements about the quality of evidence – application of insufficient or inappropriate findings of the research to the claim – ineffective or irrelevant suggestions.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Communication

Assessment objective

7. communicate understandings and research findings, arguments and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology

The student work has the following characteristics:	Marks
• effective communication of understandings and research findings, arguments and conclusions about social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – fluent and concise use of scientific language and representations – appropriate use of genre conventions – acknowledgment of sources of information through appropriate use of referencing conventions.	2
• adequate communication of understandings and research findings, arguments and conclusions social psychology, interpersonal processes, attitudes or cross-cultural psychology demonstrated by – competent use of scientific language and representations – use of basic genre conventions – use of basic referencing conventions.	1
• does not satisfy any of the descriptors above.	0

5.7.2 Summative external assessment (EA): Examination (50%)

General information

Summative external assessment is developed and marked by the QCAA. In Psychology, it contributes 50% to a student's overall subject result.

Summative external assessment assesses learning from both Units 3 and 4.

The external assessment in Psychology is common to all schools and administered under the same conditions, at the same time, on the same day.

Description

The examination assesses the application of a range of cognitions to multiple provided items.

Student responses must be completed individually, under supervised conditions and in a set timeframe.

Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

1. describe and explain localisation of function in the brain, visual perception, memory, learning, social psychology, interpersonal processes, attitudes and cross-cultural psychology
2. apply understanding of localisation of function in the brain, visual perception, memory, learning, social psychology, interpersonal processes, attitudes and cross-cultural psychology
3. analyse evidence about localisation of function in the brain, visual perception, memory, learning, social psychology, interpersonal processes, attitudes and cross-cultural psychology to identify trends, patterns, relationships, limitations or uncertainty
4. interpret evidence about localisation of function in the brain, visual perception, memory, learning, social psychology, interpersonal processes, attitudes and cross-cultural psychology to draw conclusions based on analysis.

Note: Objectives 5, 6 and 7 are not assessed in this instrument.

Specifications

Description

This examination will include two papers. Each paper consists of a number of different types of possible items:

- multiple choice
- short response items requiring single-word, sentence or paragraph responses
- calculating using algorithms
- interpreting graphs, tables or diagrams
- responding to unseen data and/or stimulus
- extended response (300–350 words or equivalent).

Conditions

Paper 1

- Time: 90 minutes plus 10 minutes perusal.
- Other: QCAA-approved graphics calculator permitted.

Paper 2

- Time: 90 minutes plus 10 minutes perusal.
- Other: QCAA-approved graphics calculator permitted.

Instrument-specific marking guide

No ISMG is provided for the external assessment.

6 Glossary

Term	Explanation
A	
accomplished	highly trained or skilled in a particular activity; perfected in knowledge or training; expert
accuracy	the condition or quality of being true, correct or exact; freedom from error or defect; precision or exactness; correctness; in science, the extent to which a measurement result represents the quantity it purports to measure; an accurate measurement result includes an estimate of the true value and an estimate of the uncertainty
accurate	precise and exact; to the point; consistent with or exactly conforming to a truth, standard, rule, model, convention or known facts; free from error or defect; meticulous; correct in all details
acknowledgment	recognition of the authority or validity of something
adept	very/highly skilled or proficient at something; expert
adequate	satisfactory or acceptable in quality or quantity equal to the requirement or occasion
algebraic representations	a set of symbols linked by mathematical operations; the set of symbols summarise relationships between variables (ACARA 2015c)
algorithm	an effective procedure for solving a particular mathematical problem in a finite number of steps
alternative hypothesis	also known as an experimental hypothesis, a hypothesis stating that there is a statistical significance between two variables; a statement about a population parameter that is alternative to the null hypothesis, which states that there is a non-zero effect of a stated exact size; for example, H_1 : μ = 50 (Cumming & Calin-Jageman 2017)
analyse	dissect to ascertain and examine constituent parts and/or their relationships; break down or examine in order to identify the essential elements, features, components or structure; determine the logic and reasonableness of information; examine or consider something in order to explain and interpret it, for the purpose of finding meaning or relationships and identifying patterns, similarities and differences
analysis	examination of evidence to identify the essential features, components, elements or structure; identification of patterns, similarities and differences
analytical technique	a procedure or method for analysing data

Term	Explanation
applied learning	the acquisition and application of knowledge, understanding and skills in real-world or lifelike contexts that may encompass workplace, industry and community situations; it emphasises learning through doing and includes both theory and the application of theory, connecting subject knowledge and understanding with the development of practical skills
Applied subject	a subject whose primary pathway is work and vocational education; it emphasises applied learning and community connections; a subject for which a syllabus has been developed by the QCAA with the following characteristics: results from courses developed from Applied syllabuses contribute to the QCE; results may contribute to ATAR calculations
apply	use knowledge and understanding in response to a given situation or circumstance; carry out or use a procedure in a given or particular situation
appraise	evaluate the worth, significance or status of something; judge or consider a text or piece of work
appreciate	recognise or make a judgment about the value or worth of something; understand fully; grasp the full implications of
appropriate	acceptable; suitable or fitting for a particular purpose, circumstance, context, etc.
apt	suitable to the purpose or occasion; fitting, appropriate
area of study	a division of, or a section within a unit
argue	give reasons for or against something; challenge or debate an issue or idea; persuade, prove or try to prove by giving reasons
argument	process of reasoning; series of reasons; a statement or fact tending to support a point
aspect	a particular part of a feature of something; a facet, phase or part of a whole
assess	measure, determine, evaluate, estimate or make a judgment about the value, quality, outcomes, results, size, significance, nature or extent of something
assessment	purposeful and systematic collection of information about students' achievements
assessment instrument	a tool or device used to gather information about student achievement
assessment objectives	drawn from the unit objectives and contextualised for the requirements of the assessment instrument (see also 'syllabus objectives', 'unit objectives')
assessment technique	the method used to gather evidence about student achievement (e.g. examination, project, investigation)
astute	showing an ability to accurately assess situations or people; of keen discernment

Term	Explanation
ATAR	Australian Tertiary Admission Rank
authoritative	able to be trusted as being accurate or true; reliable; commanding and self-confident; likely to be respected and obeyed
B	
balanced	keeping or showing a balance; not biased; fairly judged or presented; taking everything into account in a fair, well-judged way
basic	fundamental
behaviour	in science, the action of any material; the action or activity of an individual
C	
calculate	determine or find (e.g. a number, answer) by using mathematical processes; obtain a numerical answer showing the relevant stages in the working; ascertain/determine from given facts, figures or information
case study	an in-depth and longitudinal analysis of a person, group or phenomenon; a study that uses a variety of techniques, including personal interviews, direct observation, psychometric tests and archival recorders
categorise	place in or assign to a particular class or group; arrange or order by classes or categories; classify, sort out, sort, separate
challenging	difficult but interesting; testing one's abilities; demanding and thought-provoking; usually involving unfamiliar or less familiar elements
characteristic	a typical feature or quality
claim	an assertion made without any accompanying evidence to support it
clarify	make clear or intelligible; explain; make a statement or situation less confused and more comprehensible
clarity	clearness of thought or expression; the quality of being coherent and intelligible; free from obscurity of sense; without ambiguity; explicit; easy to perceive, understand or interpret
classify	arrange, distribute or order in classes or categories according to shared qualities or characteristics
clear	free from confusion, uncertainty, or doubt; easily seen, heard or understood
clearly	in a clear manner; plainly and openly, without ambiguity
coherent	having a natural or due agreement of parts; connected; consistent; logical, orderly; well-structured and makes sense; rational, with parts that are harmonious; having an internally consistent relation of parts

Term	Explanation
cohesive	characterised by being united, bound together or having integrated meaning; forming a united whole
collate	to put together; to compare
collection	in science, a systematic approach to gathering and measuring evidence from a variety of sources in order to evaluate outcomes and make predictions
comment	express an opinion, observation or reaction in speech or writing; give a judgment based on a given statement or result of a calculation
communicate	convey knowledge and/or understandings to others; make known; transmit
compare	display recognition of similarities and differences and recognise the significance of these similarities and differences
competent	having suitable or sufficient skills, knowledge, experience, etc. for some purpose; adequate but not exceptional; capable; suitable or sufficient for the purpose; having the necessary ability, knowledge or skill to do something successfully; efficient and capable (of a person); acceptable and satisfactory, though not outstanding
competently	in an efficient and capable way; in an acceptable and satisfactory, though not outstanding, way
complex	composed or consisting of many different and interconnected parts or factors; compound; composite; characterised by an involved combination of parts; complicated; intricate; a complex whole or system; a complicated assembly of particulars
comprehend	understand the meaning or nature of; grasp mentally
comprehensive	inclusive; of large content or scope; including or dealing with all or nearly all elements or aspects of something; wide-ranging; detailed and thorough, including all that is relevant
concept	in science, an idea or model explaining some natural phenomenon; a theoretical construct; a thought, idea or notion
concise	expressing much in few words; giving a lot of information clearly and in a few words; brief, comprehensive and to the point; succinct, clear, without repetition of information
concisely	in a way that is brief but comprehensive; expressing much in few words; clearly and succinctly
conclusion	a judgment based on evidence (ACARA 2015c)
conduct	direct in action or course; manage; organise; carry out
confounding variables	variables that a researcher fails to control that can affect the interval validity of an experiment

Term	Explanation
consider	think deliberately or carefully about something, typically before making a decision; take something into account when making a judgment; view attentively or scrutinise; reflect on
considerable	fairly large or great; thought about deliberately and with a purpose
considered	formed after careful and deliberate thought
consistent	agreeing or accordant; compatible; not self-opposed or self-contradictory, constantly adhering to the same principles; acting in the same way over time, especially so as to be fair or accurate; unchanging in nature, standard, or effect over time; not containing any logical contradictions (of an argument); constant in achievement or effect over a period of time
construct	create or put together (e.g. an argument) by arranging ideas or items; display information in a diagrammatic or logical form; make; build
contrast	display recognition of differences by deliberate juxtaposition of contrary elements; show how things are different or opposite; give an account of the differences between two or more items or situations, referring to both or all of them throughout
control	in relation to a group, the group of participants not exposed to the independent variable
controlled	shows the exercise of restraint or direction over; held in check; restrained, managed or kept within certain bounds
convenience sampling	a sampling procedure that chooses participants based on availability; a practically achievable — rather than random — sample from a population (Cumming & Calin-Jageman 2017)
convincing	persuaded by argument or proof; leaving no margin of doubt; clear; capable of causing someone to believe that something is true or real; persuading or assuring by argument or evidence; appearing worthy of belief; credible or plausible
correct	conforming to fact or truth; accurate
correlational research designs	research that assesses the degree to which two variables are related, so that knowing the value of one variable can lead to prediction of a second variable (Burton, Westen & Kowalski, 2015)
counterbalancing	an experimental procedure; a random assignment of participants in study with a repeated measures design to different testing orders, or other conditions, to reduce any carryover effects (Cumming & Calin-Jageman 2017)
course	a defined amount of learning developed from a subject syllabus
create	bring something into being or existence; produce or evolve from one's own thought or imagination; reorganise or put elements together into a new pattern or structure or to form a coherent or functional whole

Term	Explanation
creative	resulting from originality of thought or expression; relating to or involving the use of the imagination or original ideas to create something; having good imagination or original ideas
credible	capable or worthy of being believed; believable; convincing
criterion	the property or characteristic by which something is judged or appraised
critical	involving skilful judgment as to truth, merit, etc.; involving the objective analysis and evaluation of an issue in order to form a judgment; expressing or involving an analysis of the merits and faults of a work of literature, music, or art; incorporating a detailed and scholarly analysis and commentary (of a text); rationally appraising for logical consistency and merit
critique	review (e.g. a theory, practice, performance) in a detailed, analytical and critical way
cursory	hasty, and therefore not thorough or detailed; performed with little attention to detail; going rapidly over something, without noticing details; hasty; superficial
D	
data	in science, measurements of an attribute or attributes; data may be quantitative or qualitative and be from primary or secondary sources (ACARA 2015c)
dataset	qualitative data and/or quantitative data (e.g. diagram, graph, image, map, photograph, table) derived from a practical, activity or case study
decide	reach a resolution as a result of consideration; make a choice from a number of alternatives
deduce	reach a conclusion that is necessarily true, provided a given set of assumptions is true; arrive at, reach or draw a logical conclusion from reasoning and the information given
defensible	justifiable by argument; capable of being defended in argument
define	give the meaning of a word, phrase, concept or physical quantity; state meaning and identify or describe qualities
demonstrate	prove or make clear by argument, reasoning or evidence, illustrating with practical example; show by example; give a practical exhibition
dependent variable	the variable measured in a study that provides the data to be analysed (Cumming & Calin-Jageman 2017)
derive	arrive at by reasoning; manipulate a mathematical relationship to give a new equation or relationship; in mathematics, obtain the derivative of a function
describe	give an account (written or spoken) of a situation, event, pattern or process, or of the characteristics or features of something

Term	Explanation
design	produce a plan, simulation, model or similar; plan, form or conceive in the mind; in English, select, organise and use particular elements in the process of text construction for particular purposes; these elements may be linguistic (words), visual (images), audio (sounds), gestural (body language), spatial (arrangement on the page or screen) and multimodal (a combination of more than one)
detailed	executed with great attention to the fine points; meticulous; including many of the parts or facts
determine	establish, conclude or ascertain after consideration, observation, investigation or calculation; decide or come to a resolution
develop	elaborate, expand or enlarge in detail; add detail and fullness to; cause to become more complex or intricate
devise	think out; plan; contrive; invent
differentiate	identify the difference/s in or between two or more things; distinguish, discriminate; recognise or ascertain what makes something distinct from similar things; in mathematics, obtain the derivative of a function
discerning	discriminating; showing intellectual perception; showing good judgment; making thoughtful and astute choices; selected for value or relevance
discriminate	note, observe or recognise a difference; make or constitute a distinction in or between; differentiate; note or distinguish as different
discriminating	differentiating; distinctive; perceiving differences or distinctions with nicety; possessing discrimination; perceptive and judicious; making judgments about quality; having or showing refined taste or good judgment
discuss	examine by argument; sift the considerations for and against; debate; talk or write about a topic, including a range of arguments, factors or hypotheses; consider, taking into account different issues and ideas, points for and/or against, and supporting opinions or conclusions with evidence
disjointed	disconnected; incoherent; lacking a coherent order/sequence or connection
distinguish	recognise as distinct or different; note points of difference between; discriminate; discern; make clear a difference/s between two or more concepts or items
diverse	of various kinds or forms; different from each other
document	support (e.g. an assertion, claim, statement) with evidence (e.g. decisive information, written references, citations)
double blind procedures	experimental procedures whereby the methods and expected outcomes are not known by the researcher administering the experiment or the participant

Term	Explanation
draw conclusions	make a judgment based on reasoning and evidence
E	
ecological validity	a type of external validity that describes how well results obtained from research are representative of the wider world, not just of the sample
effective	successful in producing the intended, desired or expected result; meeting the assigned purpose
efficient	working in a well-organised and competent way; maximum productivity with minimal expenditure of effort; acting or producing effectively with a minimum of waste, expense or unnecessary effort
element	a component or constituent part of a complex whole; a fundamental, essential or irreducible part of a composite entity
elementary	simple or uncompounded; relating to or dealing with elements, rudiments or first principles (of a subject); of the most basic kind; straightforward and uncomplicated
erroneous	based on or containing error; mistaken; incorrect
essential	absolutely necessary; indispensable; of critical importance for achieving something
ethics committees	a committee that ensures researchers follow ethical rules of conduct when undertaking psychological research in order to protect research participants, the reputation of psychology and psychologists themselves
evaluate	make an appraisal by weighing up or assessing strengths, implications and limitations; make judgments about ideas, works, solutions or methods in relation to selected criteria; examine and determine the merit, value or significance of something, based on criteria
evidence	in science, evidence is data that has been selected as it is considered reliable and valid and can be used to support a particular idea, conclusion or decision; evidence gives weight or value to data by considering its credibility, acceptance, bias, status, appropriateness and reasonableness (ACARA 2015c)
examination	a supervised test that assesses the application of a range of cognitions to one or more provided items such as questions, scenarios and/or problems; student responses are completed individually, under supervised conditions, and in a set timeframe
examine	investigate, inspect or scrutinise; inquire or search into; consider or discuss an argument or concept in a way that uncovers the assumptions and interrelationships of the issue
experiment	try out or test new ideas or methods, especially in order to discover or prove something; undertake or perform a scientific procedure to test a hypothesis, make a discovery or demonstrate a known fact in science, an investigation that involves carrying out a practical activity

Term	Explanation
experimental	relating to, derived from, or founded on experiment
experimental group	the group of participants that are exposed to the independent variable
explain	make an idea or situation plain or clear by describing it in more detail or revealing relevant facts; give an account; provide additional information
explicit	clearly and distinctly expressing all that is meant; unequivocal; clearly developed or formulated; leaving nothing merely implied or suggested
explore	look into both closely and broadly; scrutinise; inquire into or discuss something in detail
express	convey, show or communicate (e.g. a thought, opinion, feeling, emotion, idea or viewpoint); in words, art, music or movement, convey or suggest a representation of; depict
extend	in science, to extend an experiment is to modify the methodology to overcome limitations of the scope or applicability of the data
extended response	an open-ended assessment technique that focuses on the interpretation, analysis, examination and/or evaluation of ideas and information in response to a particular situation or stimulus; while students may undertake some research when writing the extended response, it is not the focus of this technique; an extended response occurs over an extended and defined period of time; an item on an examination may also require an extended response, either written or oral
Extension subject	a two-unit subject for which a syllabus has been developed by QCAA; it is an extension of one or more general or alternative sequence subject/s; studied concurrently with the final two units of that subject/s or after completion of, the final two units of that subject/s
extensions	in science, modifications to the investigation that could be used to further examine the claim
extensive	of great extent; wide; broad; far-reaching; comprehensive; lengthy; detailed; large in amount or scale
external assessment	summative assessment that occurs towards the end of a course of study and is common to all schools; developed and marked by the QCAA according to a commonly applied marking scheme
external examination	a supervised test, developed and marked by the QCAA, that assesses the application of a range of cognitions to multiple provided items such as questions, scenarios and/or problems; student responses are completed individually, under supervised conditions, and in a set timeframe
extraneous variables	variables that inadvertently affect the experiment, other than the independent variable

Term	Explanation
extrapolate	infer or estimate by extending or projecting known information; conjecture; infer from what is known; extend the application of something (e.g. a method or conclusion) to an unknown situation by assuming that existing trends will continue or similar methods will be applicable
extrapolation	extension of a conclusion to a new situation, with the assumption that existing trends will continue
F	
factual	relating to or based on facts; concerned with what is actually the case; actually occurring; having verified existence
familiar	well-acquainted; thoroughly conversant with; well-known from long or close association; often encountered or experienced; common; (of materials, texts, skills or circumstances) having been the focus of learning experiences or previously encountered in prior learning activities
feasible	capable of being achieved, accomplished or put into effect; reasonable enough to be believed or accepted; probable; likely
feature	distinctive attribute, characteristic, property or quality of evidence
findings	in science, the outcomes of research, investigation or experimentation, including facts or principles established in these ways
fluent	spoken or written with ease; able to speak or write smoothly, easily or readily; articulate; eloquent; in artistic performance, characteristic of a highly developed and excellently controlled technique; flowing; polished; flowing smoothly, easily and effortlessly
fluently	in a graceful and seemingly effortless manner; in a way that progresses smoothly and readily
formative assessment	assessment whose major purpose is to improve teaching and student achievement
fragmented	disorganised; broken down; disjointed or isolated
frequent	happening or occurring often at short intervals; constant, habitual, or regular
fundamental	forming a necessary base or core; of central importance; affecting or relating to the essential nature of something; part of a foundation or basis
G	
General subject	a subject for which a syllabus has been developed by the QCAA with the following characteristics: results from courses developed from General syllabuses contribute to the QCE; General subjects have an external assessment component; results may contribute to ATAR calculations
generate	produce; create; bring into existence

Term	Explanation
genre conventions	agreed and acceptable conditions; a style or category
graphical representations	in science, a visual representation of the relationship between quantities plotted with reference to a set of axes; also known as a graph (ACARA 2015c)
H	
hypothesis	in science, a tentative explanation for an observed phenomenon, expressed as a precise and unambiguous statement that can be supported or refuted by experiment (ACARA 2015c)
hypothesise	formulate a supposition to account for known facts or observed occurrences; conjecture, theorise, speculate; especially on uncertain or tentative grounds
I	
identify	distinguish; locate, recognise and name; establish or indicate who or what someone or something is; provide an answer from a number of possibilities; recognise and state a distinguishing factor or feature
illogical	lacking sense or sound reasoning; contrary to or disregardful of the rules of logic; unreasonable
implement	put something into effect, e.g. a plan or proposal
implication	a likely consequence of something; a conclusion that may be drawn though it is implied rather than explicit
implicit	implied, rather than expressly stated; not plainly expressed; capable of being inferred from something else
improbable	not probable; unlikely to be true or to happen; not easy to believe
improvements	in science, modifications to an investigation that mitigate the limitations of the evidence, method or design
inaccurate	not accurate
inadequate	not satisfactory or acceptable in quality and/or quantity to the requirements of the situation
inappropriate	not suitable or proper in the circumstances
inconsistent	lacking agreement, as one thing with another, or two or more things in relation to each other; at variance; not consistent; not in keeping; not in accordance; incompatible, incongruous
incorrect	not conforming to fact or truth
independent	thinking or acting for oneself, not influenced by others
independent groups design	an experimental research design that uses different participants in each condition of the independent variable
independent variable	also known as the IV, the variable with values chosen or manipulated by the researcher; the independent variable can take a number of levels (Cumming & Calin-Jageman 2017)

Term	Explanation
in-depth	comprehensive and with thorough coverage; extensive or profound; well-balanced or fully developed
ineffective	not producing a result, or not producing any significant result; not producing the intended, desired or expected result
infer	derive or conclude something from evidence and reasoning, rather than from explicit statements; listen or read beyond what has been literally expressed; imply or hint at
informed	knowledgeable; learned; having relevant knowledge; being conversant with the topic; of a decision or judgment, based on an understanding of the facts of the situation
innovative	new and original; introducing new ideas; original and creative in thinking
insightful	showing understanding of a situation or process; understanding relationships in complex situations; informed by observation and deduction
instrument-specific marking guide	ISMG; a tool for marking that describes the characteristics evident in student responses and aligns with the identified objectives for the assessment (see 'assessment objectives')
insufficient	not enough; inadequate for the purpose
integral	*adjective* necessary for the completeness of the whole; essential or fundamental; *noun* in mathematics, the result of integration; an expression from which a given function, equation, or system of equations is derived by differentiation
intended	designed; meant; done on purpose; intentional
internal assessment	assessments that are developed by schools; summative internal assessments are endorsed by the QCAA before use in schools and results externally confirmed; contributes towards a student's final result
interpret	use knowledge and understanding to recognise trends and draw conclusions from given information; make clear or explicit; elucidate or understand in a particular way; bring out the meaning of, e.g. a dramatic or musical work, by performance or execution; bring out the meaning of an artwork by artistic representation or performance; give one's own interpretation of; identify or draw meaning from, or give meaning to, information presented in various forms, such as words, symbols, pictures or graphs
interviews	research tools in which the investigator asks the participant questions (Burton, Westen & Kowalski, 2015)

Term	Explanation
invalid	not sound, just or well-founded; not having a sound basis in logic or fact (or an argument or point); not reasonable or cogent; not able to be supported; not legitimate or defensible; not applicable
investigate	carry out an examination or formal inquiry in order to establish or obtain facts and reach new conclusions; search, inquire into, interpret and draw conclusions about data and information
investigation	an assessment technique that requires students to research a specific problem, question, issue, design challenge or hypothesis through the collection, analysis and synthesis of primary and/or secondary data; it uses research or investigative practices to assess a range of cognitions in a particular context; an investigation occurs over an extended and defined period of time in science, an investigation is a scientific process of answering a question, exploring an idea or solving a problem that requires activities such as planning a course of action, collecting data, interpreting data, reaching a conclusion and communicating these activities (ACARA 2015c)
irrelevant	not relevant; not applicable or pertinent; not connected with or relevant to something
ISMG	instrument-specific marking guide; a tool for marking that describes the characteristics evident in student responses and aligns with the identified objectives for the assessment (see 'assessment objectives')
isolated	detached, separate, or unconnected with other things; one-off; something set apart or characterised as different in some way
J	
judge	form an opinion or conclusion about; apply both procedural and deliberative operations to make a determination
justified	sound reasons or evidence are provided to support an argument, statement or conclusion
justify	give reasons or evidence to support an answer, response or conclusion; show or prove how an argument, statement or conclusion is right or reasonable
L	
learning area	a grouping of subjects, with related characteristics, within a broad field of learning, e.g. the Arts, sciences, languages
limitation	a weak point or disadvantage that makes evidence less effective
link	anything serving to connect one part or thing with another
logical	rational and valid; internally consistent; reasonable; reasoning in accordance with the principles/rules of logic or formal argument; characterised by or capable of clear, sound reasoning; (of an action, decision, etc.) expected or sensible under the circumstances

Term	Explanation
logically	according to the rules of logic or formal argument; in a way that shows clear, sound reasoning; in a way that is expected or sensible
M	
make decisions	select from available options; weigh up positives and negatives of each option and consider all the alternatives to arrive at a position
management	handling, direction or control
manipulate	adapt or change to suit one's purpose
matched participants design	an experimental research design that matches participants on an important characteristic that may affect performance, i.e. age, gender, IQ, and then one member from each matched pair is randomly assigned to the experimental or control group
mental procedures	a domain of knowledge in Marzano's taxonomy, and acted upon by the cognitive, metacognitive and self-systems; sometimes referred to as 'procedural knowledge' there are three distinct phases to the acquisition of mental procedures — the cognitive stage, the associative stage, and the autonomous stage; the two categories of mental procedures are skills (single rules, algorithms and tactics) and processes (macroprocedures)
methodical	performed, disposed or acting in a systematic way; orderly; characterised by method or order; performed or carried out systematically
methodology	a systematic, ordered approach to gathering data in a scientific experiment or investigation
minimal	least possible; small, the least amount; negligible
model	in science, a representation that describes, simplifies, clarifies or provides an explanation of the workings, structure or relationships within an object, system or idea (ACARA 2015c)
modifications	in science, changes to methodology to extend, refine or redirect the research focus
modify	change the form or qualities of; make partial or minor changes to something
multimodal	uses a combination of at least two modes (e.g. spoken, written), delivered at the same time, to communicate ideas and information to a live or virtual audience, for a particular purpose; the selected modes are integrated so that each mode contributes significantly to the response

Term	Explanation
N	
narrow	limited in range or scope; lacking breadth of view; limited in amount; barely sufficient or adequate; restricted
nuanced	showing a subtle difference or distinction in expression, meaning, response, etc.; finely differentiated; characterised by subtle shades of meaning or expression; a subtle distinction, variation or quality; sensibility to, awareness of, or ability to express delicate shadings, as of meaning, feeling, or value
null hypothesis	a hypothesis that sample observations result purely by chance; a general statement or default position that there is no relationship between two measured phenomena, or no association among groups; a statement about a population parameter, often H_0 : μ = 0, that is tested (Cumming & Calin-Jageman 2017)
O	
objectives	see 'syllabus objectives', 'unit objectives', 'assessment objectives'
observational research designs	a type of research method that involves the observation and description of a subject's behaviour; types include direct (participant observation, structured observation and field experiments) and indirect (physical trace evidence and archival records).
obvious	clearly perceptible or evident; easily seen, recognised or understood
optimal	best, most favourable, under a particular set of circumstances
organise	arrange, order; form as or into a whole consisting of interdependent or coordinated parts, especially for harmonious or united action
organised	systematically ordered and arranged; having a formal organisational structure to arrange, coordinate and carry out activities
outcome	result of something; a consequence
outlier	a value that 'lies outside' (is much smaller or larger than) most of the other values in a set of data
outstanding	exceptionally good; clearly noticeable; prominent; conspicuous; striking
P	
partial	not total or general; existing only in part; attempted, but incomplete
participant	in relation to a variable, participant variables are individual characteristics of participants that could affect the results of psychological research, e.g. mood, intelligence, anxiety, concentration; in relation to expectations, participant expectations are the way participants may adjust their behaviour depending on the nature and design of the psychological research

Term	Explanation
particular	distinguished or different from others or from the ordinary; noteworthy
pattern	a repeated occurrence or sequence (ACARA 2015c)
perceptive	having or showing insight and the ability to perceive or understand; discerning (see also 'discriminating')
performance	an assessment technique that requires students to demonstrate a range of cognitive, technical, creative and/or expressive skills and to apply theoretical and conceptual understandings, through the psychomotor domain; it involves student application of identified skills when responding to a task that involves solving a problem, providing a solution or conveying meaning or intent; a performance is developed over an extended and defined period of time
persuasive	capable of changing someone's ideas, opinions or beliefs; appearing worthy of approval or acceptance; (of an argument or statement) communicating reasonably or credibly (see also 'convincing')
perusal time	time allocated in an assessment to reading items and tasks and associated assessment materials; no writing is allowed; students may not make notes and may not commence responding to the assessment in the response space/book
phenomena	events that are not artificial and can be observed through the senses or can be scientifically described or explained
planning time	time allocated in an assessment to planning how to respond to items and tasks and associated assessment materials; students may make notes but may not commence responding to the assessment in the response space/book; notes made during planning are not collected, nor are they graded or used as evidence of achievement
polished	flawless or excellent; performed with skilful ease
population validity	a type of external validity that describes how well the sample used can be extrapolated to the population as a whole
practical	in science, an activity that produces primary data
precise	definite or exact; definitely or strictly stated, defined or fixed; characterised by definite or exact expression or execution
precision	accuracy; exactness; exact observance of forms in conduct or actions in science, exactness; how close two or more measurements of the same object or phenomena are to each other
predict	give an expected result of an upcoming action or event; suggest what may happen based on available information
primary data	data collected directly by a person or group (ACARA 2015c)
process	in science, to collect and manipulate data to produce meaningful information; operate on a set of data to extract the required information in an appropriate form such as tables or graphs

Term	Explanation
product	an assessment technique that focuses on the output or result of a process requiring the application of a range of cognitive, physical, technical, creative and/or expressive skills, and theoretical and conceptual understandings; a product is developed over an extended and defined period of time
proficient	well advanced or expert in any art, science or subject; competent, skilled or adept in doing or using something
project	an assessment technique that focusses on a problem-solving process requiring the application of a range of cognitive, technical and creative skills and theoretical understandings; the response is a coherent work that documents the iterative process undertaken to develop a solution and includes written paragraphs and annotations, diagrams, sketches, drawings, photographs, video, spoken presentations, physical prototypes and/or models; a project is developed over an extended and defined period of time
propose	put forward (e.g. a point of view, idea, argument, suggestion) for consideration or action
prove	use a sequence of steps to obtain the required result in a formal way
psychomotor procedures	a domain of knowledge in Marzano's taxonomy, and acted upon by the cognitive, metacognitive and self-systems; these are physical procedures used to negotiate daily life and to engage in complex physical activities; the two categories of psychomotor procedures are skills (foundational procedures and simple combination procedures) and processes (complex combination procedures)
purposeful	having an intended or desired result; having a useful purpose; determined; resolute; full of meaning; significant; intentional
Q	
QCE	Queensland Certificate of Education
qualitative data	information that is not numerical in nature
quality of evidence	the standard of evidence, as measured against relevant criteria
quantitative data	numerical information (Taylor 1982)
quantity	in science, having magnitude, size, extent, amount or the like
quasi-experimental designs	research designs that employ the logic of experimental methods but lack absolute control over variables (Burton, Westen & Kowalski 2015)
R	
random allocation	a sampling procedure that ensures each participant has an equal chance of being assigned to one group or the other
random sampling	a sampling procedure that ensures all participants have an equal chance of being selected from the population
rationale	a set of reasons, or logical basis for a course of action or decision

Term	Explanation
raw data	unprocessed and/or unanalysed data; data that has been collected without any additional processing (Taylor 1982)
realise	create or make (e.g. a musical, artistic or dramatic work); actualise; make real or concrete; give reality or substance to
reasonable	endowed with reason; having sound judgment; fair and sensible; based on good sense; average; appropriate, moderate
reasoned	logical and sound; based on logic or good sense; logically thought out and presented with justification; guided by reason; well-grounded; considered
recall	remember; present remembered ideas, facts or experiences; bring something back into thought, attention or into one's mind
recognise	identify or recall particular features of information from knowledge; identify that an item, characteristic or quality exists; perceive as existing or true; be aware of or acknowledge
redirect	in science, to redirect an experiment is to modify the methodology to gain further insight into the phenomena observed in the original experiment
referencing conventions	agreed, consistent ways of referencing a source of information
refine	in science, to refine an experiment is to modify the methodology to obtain more accurate or precise data
refined	developed or improved so as to be precise, exact or subtle
reflect on	think about deeply and carefully
rehearsed	practised; previously experienced; practised extensively
related	associated with or linked to
relationship	scientific relationships are a connection or association between ideas or between components of systems and structures (ACARA 2015c)
relevance	being related to the matter at hand
relevant	bearing upon or connected with the matter in hand; to the purpose; applicable and pertinent; having a direct bearing on
reliable	constant and dependable or consistent and repeatable
reliability	in science, the likelihood that another experimenter will obtain the same results (or very similar results) if they perform exactly the same experiment under the same conditions (ACARA 2015c, Taylor 1982)
repeated measures design	an experimental research design where the same participants take part in each condition; 'order effects' can occur in repeated measures designs, where the order the conditions are presented in can affect participants' behaviour, e.g. performance in the second condition may be better (i.e. practice effect) or worse (i.e. fatigue effect)

Term	Explanation
repetitive	containing or characterised by repetition, especially when unnecessary or tiresome
reporting	providing information that succinctly describes student performance at different junctures throughout a course of study
representation	in science, verbal, physical or mathematical demonstration of understanding of a science concept or concepts; a concept can be represented in a range of ways and using multiple models (ACARA 2015c)
research	to locate, gather, record and analyse information in order to develop understanding (ACARA 2015c)
research ethics	norms of conduct that determine ethical research behaviour; research ethics are governed by principles such as honesty, objectivity, integrity, openness, and respect for intellectual property and include consideration of animal ethics (ACARA 2015c)
research question	a question that directs the scientific inquiry activity; it focuses the research investigation or student experiment, informing the direction of the research, and guiding all stages of inquiry, analysis, interpretation and evaluation
resolve	in the Arts, consolidate and communicate intent through a synthesis of ideas and application of media to express meaning
risk assessment	evaluations performed to identify, assess and control hazards in a systematic way that is consistent, relevant and applicable to all school activities; requirements for risk assessments related to particular activities will be determined by jurisdictions, schools or teachers as appropriate (ACARA 2015c)
routine	often encountered, previously experienced; commonplace; customary and regular; well-practised; performed as part of a regular procedure, rather than for a special reason
rudimentary	relating to rudiments or first principles; elementary; undeveloped; involving or limited to basic principles; relating to an immature, undeveloped or basic form
S	
safe	secure; not risky
scientific language	terminology that has specific meaning in a scientific context
scrutinise	to examine closely or critically
secondary data	data collected by a person or group other than the person or group using the data (ACARA 2015c)
secure	sure; certain; able to be counted on; self-confident; poised; dependable; confident; assured; not liable to fail
select	choose in preference to another or others; pick out

Term	Explanation
self-report research designs	any test, measure or survey that allows participants to report on their own symptoms, behaviours, beliefs or attitudes
sensitive	capable of perceiving with a sense or senses; aware of the attitudes, feelings or circumstances of others; having acute mental or emotional sensibility; relating to or connected with the senses or sensation
sequence	place in a continuous or connected series; arrange in a particular order
show	provide the relevant reasoning to support a response
significant	important; of consequence; expressing a meaning; indicative; includes all that is important; sufficiently great or important to be worthy of attention; noteworthy; having a particular meaning; indicative of something
simple	easy to understand, deal with and use; not complex or complicated; plain; not elaborate or artificial; may concern a single or basic aspect; involving few elements, components or steps
simplistic	characterised by extreme simplification, especially if misleading; oversimplified
simulation	a representation of a process, event or system which imitates a real or idealised situation (ACARA 2015c)
single blind procedures	experimental procedures whereby the methods and expected outcomes are not known by participants
sketch	execute a drawing or painting in simple form, giving essential features but not necessarily with detail or accuracy; represent by means of a diagram or graph; the sketch should give a general idea of the required shape or relationship and should include features
skilful	having technical facility or practical ability; possessing, showing, involving or requiring skill; expert, dexterous; demonstrating the knowledge, ability or training to perform a certain activity or task well; trained, practised or experienced
skilled	having or showing the knowledge, ability or training to perform a certain activity or task well; having skill; trained or experienced; showing, involving or requiring skill
solve	find an answer to, explanation for, or means of dealing with (e.g. a problem); work out the answer or solution to (e.g. a mathematical problem); obtain the answer/s using algebraic, numerical and/or graphical methods
sophisticated	of intellectual complexity; reflecting a high degree of skill, intelligence, etc.; employing advanced or refined methods or concepts; highly developed or complicated

Term	Explanation
source	any piece of scientific literature or text from which scientific evidence is drawn
specific	clearly defined or identified; precise and clear in making statements or issuing instructions; having a special application or reference; explicit, or definite; peculiar or proper to something, as qualities, characteristics, effects, etc.
sporadic	happening now and again or at intervals; irregular or occasional; appearing in scattered or isolated instances
standardised instructions	a list of instructions for all participants that is the same for all people
statement	a communication or declaration setting forth facts, particulars; an expression
straightforward	without difficulty; uncomplicated; direct; easy to do or understand
stratified sampling	a type of sampling in which a sample is taken of each strata of the population
structure	*verb* give a pattern, organisation or arrangement to; construct or arrange according to a plan; *noun* in languages, arrangement of words into larger units, e.g. phrases, clauses, sentences, paragraphs and whole texts, in line with cultural, intercultural and textual conventions
structured	organised or arranged so as to produce a desired result
subject	a branch or area of knowledge or learning defined by a syllabus; school subjects are usually based in a discipline or field of study (see also 'course')
subject matter	the subject-specific body of information, mental procedures and psychomotor procedures that are necessary for students' learning and engagement within that subject
substantial	of ample or considerable amount, quantity, size, etc.; of real worth or value; firmly or solidly established; of real significance; reliable; important, worthwhile
substantiated	established by proof or competent evidence
subtle	fine or delicate in meaning or intent; making use of indirect methods; not straightforward or obvious
successful	achieving or having achieved success; accomplishing a desired aim or result
succinct	expressed in few words; concise; terse; characterised by conciseness or brevity; brief and clear
sufficient	enough or adequate for the purpose
suitable	appropriate; fitting; conforming or agreeing in nature, condition, or action

Term	Explanation
summarise	give a brief statement of a general theme or major point/s; present ideas and information in fewer words and in sequence
summative assessment	assessment whose major purpose is to indicate student achievement; summative assessments contribute towards a student's subject result
superficial	concerned with or comprehending only what is on the surface or obvious; shallow; not profound, thorough, deep or complete; existing or occurring at or on the surface; cursory; lacking depth of character or understanding; apparent and sometimes trivial
supported	corroborated; given greater credibility by providing evidence
sustained	carried on continuously, without interruption, or without any diminishing of intensity or extent
syllabus	a document that prescribes the curriculum for a course of study
syllabus objectives	outline what the school is required to teach and what students have the opportunity to learn; described in terms of actions that operate on the subject matter; the overarching objectives for a course of study (see also 'unit objectives', 'assessment objectives')
symbolise	represent or identify by a symbol or symbols
synthesise	combine different parts or elements (e.g. information, ideas, components) into a whole, in order to create new understanding
system	a group of interacting objects, materials or processes that form an integrated whole; systems can be open or closed (ACARA 2015c)
systematic	done or acting according to a fixed plan or system; methodical; organised and logical; having, showing, or involving a system, method, or plan; characterised by system or method; methodical; arranged in, or comprising an ordered system
T	
test	take measures to check the quality, performance or reliability of something
theory	in science, a set of concepts, claims and/or laws that can be used to explain and predict a wide range of related observed or observable phenomena; theories are typically founded on clearly identified assumptions, are testable, produce reproducible results and have explanatory power (ACARA 2015c)
thorough	carried out through, or applied to the whole of something; carried out completely and carefully; including all that is required; complete with attention to every detail; not superficial or partial; performed or written with care and completeness; taking pains to do something carefully and completely
thoughtful	occupied with, or given to thought; contemplative; meditative; reflective; characterised by or manifesting thought

Term	Explanation
topic	a division of, or sub-section within a unit; all topics/sub-topics within a unit are interrelated
trend	general direction in which something is changing (ACARA 2015c)
type I errors	rejection of the null hypothesis when it is true; a false positive (Cumming & Calin-Jageman 2017)
type II errors	non-rejection of the null hypothesis when it is false; a false negative, a miss (Cumming & Calin-Jageman 2017)
U	
uncertainty	range of values for a measurement result, taking account of the likely values that could be attributed to the measurement result given the measurement equipment, procedure and environment (ACARA 2015c); indicators of uncertainty may include percentage, and/or absolute measurement uncertainty, confidence intervals, inferential statistics, statistical measure of spread, e.g. range, standard deviation
unclear	not clear or distinct; not easy to understand; obscure
understand	perceive what is meant by something; grasp; be familiar with (e.g. an idea); construct meaning from messages, including oral, written and graphic communication
understanding	perception of what is meant by something
uneven	unequal; not properly corresponding or agreeing; irregular; varying; not uniform; not equally balanced
unfamiliar	not previously encountered; situations or materials that have not been the focus of prior learning experiences or activities
unit	a defined amount of subject matter delivered in a specific context or with a particular focus; it includes unit objectives particular to the unit, subject matter and assessment direction
unit objectives	drawn from the syllabus objectives and contextualised for the subject matter and requirements of a particular unit; they are assessed at least once in the unit (see also 'syllabus objectives', 'assessment objectives')
unrelated	having no relationship; unconnected
use	operate or put into effect; apply knowledge or rules to put theory into practice
V	
vague	not definite in statement or meaning; not explicit or precise; not definitely fixed, determined or known; of uncertain, indefinite or unclear character or meaning; not clear in thought or understanding; couched in general or indefinite terms; not definitely or precisely expressed; deficient in details or particulars; thinking or communicating in an unfocused or imprecise way

Term	Explanation
valid	sound, just or well-founded; authoritative; having a sound basis in logic or fact (of an argument or point); reasonable or cogent; able to be supported; legitimate and defensible; applicable
validity	in science, 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 (ACARA 2015c)
variable	*adjective* apt or liable to vary or change; changeable; inconsistent; (readily) susceptible or capable of variation; fluctuating, uncertain; *noun* in mathematics, a symbol, or the quantity it signifies, that may represent any one of a given set of number and other objects in science, a factor that can be changed, kept the same or measured in an investigation, e.g. time, distance, light, temperature
variety	a number or range of things of different kinds, or the same general class, that are distinct in character or quality; (of sources) a number of different modes or references
visual representations	in science, an image that shows relationships within scientific evidence
W	
wide	of great range or scope; embracing a great number or variety of subjects, cases, etc.; of full extent
with expression	in words, art, music or movement, conveying or indicating feeling, spirit, character, etc.; a way of expressing or representing something; vivid, effective or persuasive communication

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8 Version history

Version	Date of change	Update
1.1	August 2017	Minor editorial changes
1.2	December 2017	Editorial changes
		Syllabus objective 2: Amendment to explanatory paragraph
		Subject matter Unit 4: Topic 2 Interpersonal processes — addition to suggested research 'temperature and aggression'
		IA1: Data test • Minor amendments to Assessment objectives 2,3 & 4 • Percentage of marks modified – objective 3 — 40% changed to 30% – objective 4 — 30% changed to 40% Condition amendment (Length) — 400 words changed to 'up to 500 words'
		IA2: Student experiment Minor amendment to Assessment objective 5
		IA3: Research investigation Minor amendment to Assessment objective 5
		Amendments to ISMGs to reflect modifications to objectives
		Glossary update
1.3	June 2018	Editorial changes
		Minor amendment to subject matter in Unit 1
		IA1: Data test • Minor amendments to Assessment objective 2 • Minor amendments to description and conditions • Addition of information about cognition and nature of response for each objective
		IA2: Student experiment Minor editorial changes to ISMG
		IA3: Research investigation Minor editorial changes to ISMG
		EA: Examination • Minor amendments to Assessment objectives 3 and 4 • Minor amendments to description and conditions
		Glossary update
1.4	July 2022	Amendments to Unit 1 and Unit 2 Assessment guidance

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