

# Numeracy 2018 v1.1

## Short Course Syllabus

This Short Course syllabus may be implemented from 2018 onwards.

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# 1 Course overview

## 1.1 Introduction

### 1.1.1 Rationale

Numeracy is considered integral to a person's ability to function effectively in society. To be numerate requires more than being able to operate with numbers: it requires mathematical knowledge and understanding, mathematical problem-solving skills, literacy skills and positive beliefs and attitudes.

When students become numerate, they are able to manage situations or solve problems in real contexts such as everyday life, work and further learning. Students are able to identify or locate, act upon, interpret and communicate mathematical ideas and information. They learn to represent these ideas and information in a number of ways. This learning should take place in contexts that are relevant, cooperative, supportive, enjoyable and non-competitive.

Numeracy is embedded across the school curriculum and is developed through all phases of learning. This Numeracy Short Course senior syllabus allows teachers to design courses of study that cater for the prior learning and specific numeracy needs of their students.

This Short Course in Numeracy is a one-unit course of study, developed to meet a specific curriculum need. Results in Numeracy do not contribute to an Australian Tertiary Admission Rank (ATAR) calculation.

The course focuses on aspects of numeracy and does not replace the study of any subject from the current suite of Mathematics syllabuses. It is informed by the [Australian Core Skills Framework \(ACSF\)](#).<sup>1</sup> The requirements for a grade of C in this Short Course mirror the numeracy requirements for ACSF Level 3.

In this course of study students will:

- learn a variety of strategies to develop and monitor their own learning
- identify and communicate mathematical information that is embedded in a range of texts and contexts from everyday life and work
- use mathematical processes and strategies to solve problems in a range of situations
- reflect on outcomes and the appropriateness of mathematical processes used.

### **Assumed knowledge, prior learning or experience**

This subject is suited for students in Years 10–12 who are performing at least at Level 2 of the ACSF and who may be:

- at risk of not attaining the numeracy requirement for the QCE
- disengaged with school.

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<sup>1</sup> Department of Education, Employment and Welfare 2008, Australian Core Skills Framework, Commonwealth of Australia, Canberra, [https://docs.education.gov.au/system/files/doc/other/acsf\\_document.pdf](https://docs.education.gov.au/system/files/doc/other/acsf_document.pdf).

## Pathways

Numeracy is a Short Course suited to students who are interested in pathways beyond school that lead to vocational education and/or work. A course of study in Numeracy may establish a basis for further education and employment in the fields of trade, industry, business and community services. Students will learn within a practical context related to general employment and successful participation in society, drawing on the mathematics used by various professional and industry groups.

For more information about how ACSF has influenced the shape of this syllabus, refer to the companion document, 'Background to the Literacy and Numeracy Short Course Senior Syllabuses' available on the QCAA website  
[www.qcaa.qld.edu.au/downloads/senior/snr\\_lit\\_num\\_courses\\_10\\_bgd.pdf](http://www.qcaa.qld.edu.au/downloads/senior/snr_lit_num_courses_10_bgd.pdf).

To access the ACSF see the 'Australian Core Skills Framework' available from  
[https://docs.education.gov.au/system/files/doc/other/acsf\\_document.pdf](https://docs.education.gov.au/system/files/doc/other/acsf_document.pdf).

## 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 the objectives for each topic, which are contextualised for the subject matter and requirements of the topic. These 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 Topic 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.

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

#### 1. select and interpret mathematical information

When students select and interpret mathematical information, they identify relevant mathematical knowledge and draw meaning for everyday life, work activities and texts that may be partly embedded in a range of familiar, and some less familiar, contexts. They present facts, rules, definitions and procedures and put them into effect, performing calculations with and without the use of technology in mathematical tasks, including data located in tables, graphs and charts.

#### 2. select from and use a variety of mathematical and problem-solving strategies

When students select and use mathematical and problem-solving strategies, they investigate situations using various mathematical methods to find solutions, reflecting on processes used and evaluating outcomes. They solve a range of problems by selecting and applying mathematical processes and methods, including the use of 'in-the-head' methods, pen and paper, and calculator or technological processes; hands-on and in-context materials; personal experience; and mathematical and other prior knowledge embedded in a range of familiar, and some less familiar, contexts. They reflect on outcomes of mathematical activities and the appropriateness of mathematical processes, including the use of estimation.

### 3. use oral and written mathematical language and representation to communicate mathematically

When students use oral and written mathematical language and representation to communicate, they use formal and informal language, including mathematical conventions, symbolism, abbreviations and diagrammatic representations, to convey mathematical information and problem-solving processes and results, in a range of familiar, and some less familiar, contexts.

### 4. plan, implement and adjust processes to achieve learning outcomes

When students plan, implement and adjust processes to achieve learning outcomes, they demonstrate an awareness of themselves as learners. They plan and manage their learning through understanding their learner identity, setting goals and pathways, and planning and organising their learning to achieve their numeracy and mathematical goals.

### 5. apply learning strategies

When students apply learning strategies, they use practical methods and approaches that facilitate their learning in a range of everyday mathematical contexts. These strategies include locating, evaluating and organising information, using prior knowledge and scaffolding, and learning with and from others.

## 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 Numeracy 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. They encompass the knowledge, skills, capabilities, behaviours and dispositions that will help students live and work successfully in the 21st century.

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

Literacy skills and strategies enable students to express, interpret and communicate complex mathematical information, ideas and processes. Mathematics provides a specific and rich context for students to develop their abilities to read, write, visualise and talk about complex situations involving a range of mathematical ideas.

Students can apply and further develop their literacy skills and strategies by shifting between verbal, graphic, numerical and symbolic forms of representing problems in order to formulate, understand and solve problems and communicate results. This process of translation across different systems of representation is essential for complex mathematical reasoning and expression. Students learn to communicate their findings in different ways, using multiple

systems of representation and data displays to illustrate the relationships they have observed or constructed.

To understand and use the subject matter of this Short Course, teaching and learning strategies include:

- breaking the language code to make meaning of mathematical language and texts
- comprehending language and texts to make literal and inferred meanings about Numeracy content
- using mathematical ideas and information in classroom, real-world and/or lifelike contexts to progress students' learning.

To analyse and evaluate the content of this Short Course, teaching and learning strategies include:

- drawing conclusions about the purpose and audience of mathematical language and texts
- analysing the ways language is used to convey ideas and information in mathematical texts
- transforming language and texts to convey mathematical ideas and information in particular ways to suit audience and purpose.

These aspects of literacy knowledge and skills are embedded in the objectives, the subject matter and instrument-specific standards for Numeracy.

## **Numeracy**

Numeracy relates to the capacity to deal with quantitative aspects of life (Goos, Geiger & Dole 2012). It involves accessing, using, interpreting and communicating mathematical information and ideas when engaging with and managing the mathematical demands of real-life contexts: everyday and community life, the world of work, and opportunities for further learning (OECD 2012). Numerate citizens who are constructive, engaged and reflective are able to use mathematics to help make credible judgments and reasoned decisions (OECD 2015).

Unlike mathematics, numeracy must be understood as inseparable from context:

Mathematics climbs the ladder of abstraction to see, from sufficient height, common patterns in seemingly different things. Abstraction is what gives mathematics its power; it is what enables methods derived in one context to be applied in others. But abstraction is not the focus of numeracy. Instead, numeracy clings to specifics, marshalling all relevant aspects of setting and context to reach conclusions.

To enable students to become numerate, teachers must encourage them to see and use mathematics in everything they do. Numeracy is driven by issues that are important to people in their lives and work, not by future needs of the few who may make professional use of mathematics or statistics (Steen 2001, pp. 17–18).

Students who undertake the Short Course in Numeracy will continue to develop their numeracy skills at a more sophisticated level than in P–10.

These aspects of numeracy knowledge and skills are embedded in the objectives, objectives and subject matter and instrument-specific standards for Numeracy.

## 21st century skills

The 21st century skills identified in the following table 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	<ul style="list-style-type: none"> <li>• analytical thinking</li> <li>• problem-solving</li> <li>• decision-making</li> <li>• reasoning</li> <li>• reflecting and evaluating</li> <li>• intellectual flexibility</li> </ul>	creative thinking	<ul style="list-style-type: none"> <li>• innovation</li> <li>• initiative and enterprise</li> <li>• curiosity and imagination</li> <li>• creativity</li> <li>• generating and applying new ideas</li> <li>• identifying alternatives</li> <li>• seeing or making new links</li> </ul>
communication	<ul style="list-style-type: none"> <li>• effective oral and written communication</li> <li>• using language, symbols and texts</li> <li>• communicating ideas effectively with diverse audiences</li> </ul>	collaboration and teamwork	<ul style="list-style-type: none"> <li>• relating to others (interacting with others)</li> <li>• recognising and using diverse perspectives</li> <li>• participating and contributing</li> <li>• community connections</li> </ul>
personal and social skills	<ul style="list-style-type: none"> <li>• adaptability/flexibility</li> <li>• management (self, career, time, planning and organising)</li> <li>• character (resilience, mindfulness, open- and fair-mindedness, self-awareness)</li> <li>• leadership</li> <li>• citizenship</li> <li>• cultural awareness</li> <li>• ethical (and moral) understanding</li> </ul>	information & communication technologies (ICT) skills	<ul style="list-style-type: none"> <li>• operations and concepts</li> <li>• accessing and analysing information</li> <li>• being productive users of technology</li> <li>• digital citizenship (being safe, positive and responsible online)</li> </ul>

Numeracy helps develop the following 21st century skills:

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

These elements of 21st century skills are embedded in the objectives, subject matter and instrument-specific standards for Numeracy.



### 1.2.3 Aboriginal perspectives and Torres Strait Islander perspectives

The QCAA is committed to increasing awareness of Aboriginal perspectives and Torres Strait Islander perspectives, and improving outcomes for Aboriginal students and Torres Strait Islander students.

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 (SAE)
- 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](http://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.

In Numeracy, students have the opportunity to gain an awareness of the contributions of Aboriginal peoples and Torres Strait Islander peoples at local, regional, national and global levels through contextualisation of the subject matter.

To understand and use mathematics content, teaching and learning strategies may include:

- using pedagogies such Maths as Storytelling (MAST)<sup>2</sup>
- using mathematics subject matter in real-world Aboriginal contexts and Torres Strait Islander contexts
- identifying the specific Aboriginal issues and Torres Strait Islander issues relevant to the mathematics subject matter being covered
- providing learning experiences and opportunities that support the application of students' general mathematical knowledge and problem-solving processes in an Aboriginal context and Torres Strait Islander context.

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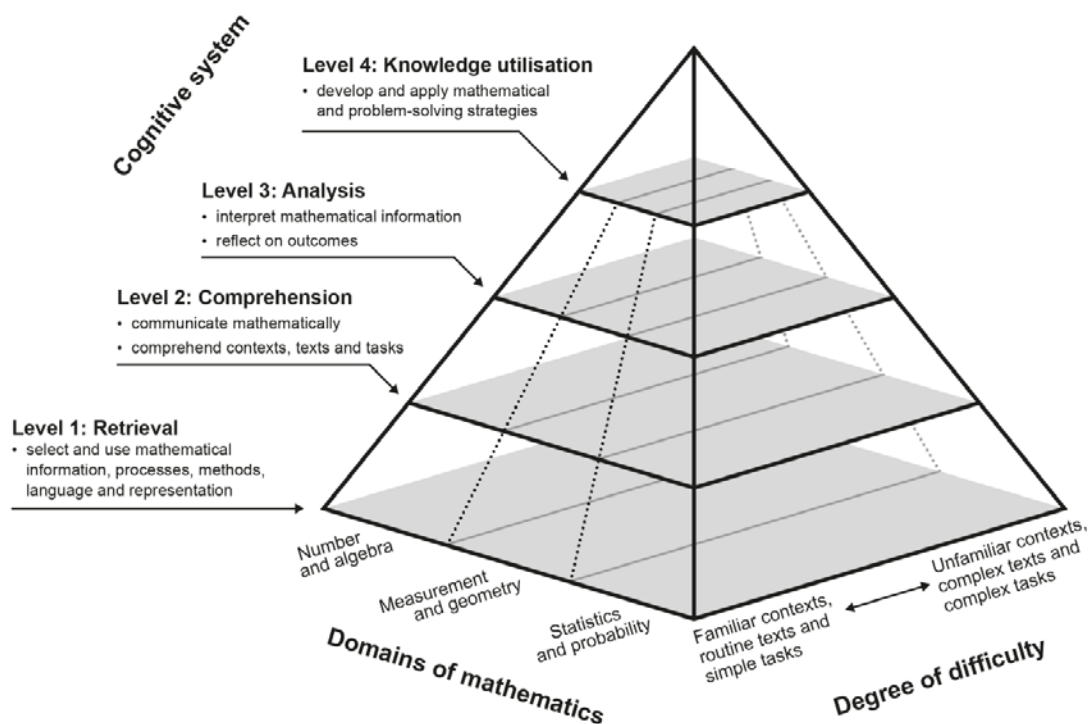
<sup>2</sup> [www.qcaa.qld.edu.au/downloads/approach2/indigenous\\_res\\_culture\\_and\\_maths.pdf](http://www.qcaa.qld.edu.au/downloads/approach2/indigenous_res_culture_and_maths.pdf)

## 1.2.4 Pedagogical and conceptual frameworks

### The relationship between foundational knowledge and problem-solving

To succeed in mathematics, students must understand the subject matter, draw on a range of cognitive skills, and apply these to problems of varying degrees of difficulty, from simple and routine through to unfamiliar situations, complex contexts and multi-step solutions (Grønmo, Lindquist, Arora & Mullis 2015). The relationship between the domains of mathematics in the Numeracy Short Course, the level of cognitive skill required (syllabus objective) and the degree of difficulty is represented in three dimensions for mathematics problems in Figure 1.

Figure 1: Mathematics problem-solving pyramid



Adapted from Verhage & de Lange (1997) and Marzano & Kendall (2007).

### Principles of developing mathematics problems

This representation shows the relative distribution of thinking and range of difficulty of mathematics problems.<sup>3</sup> It places an emphasis on building up from the basics. Success in mathematics is built on knowledge of basic facts and proficiency with foundational processes (Norton & O'Connor 2016). With a solid foundation, students can then be asked to apply higher level cognitive processes in more complex and unfamiliar situations that require the application of a wider range of concepts and skills.

#### The degree of difficulty

The difficulty of a problem is defined by its complexity and a student's familiarity with it, not the level of cognitive process required to solve it. The complexity of a particular type of problem doesn't change, but familiarity does. With practice, students become more familiar with a process and can execute it more quickly and easily (Marzano & Kendall 2007).

<sup>3</sup> For mathematics, in an assessment instrument, a 'problem' is synonymous with 'assessment item' (a question, task or command that forms part of an assessment technique).

## The cognitive system

To solve a full range of mathematics problems, students are required to engage the cognitive system at all four levels of processing knowledge: retrieval, comprehension, analysis and knowledge utilisation (Marzano & Kendall 2007). The cognitions students use to achieve the syllabus objectives are represented in the pyramid model through their alignment to these levels.

## Using a full range of questions

The pyramid model shows that problems requiring Level 1 processes to solve them can be hard and relatively complex, even though they are based on 'retrieval' and therefore might seem easy and straightforward (Shafer & Foster 1997). Problems requiring higher level processes to solve them are not necessarily more difficult than those in Level 1. There are some students who find Level 1 processes more challenging and have more success in solving problems requiring Levels 2, 3 and 4 (Webb 2009).

The distance along the 'domains of mathematics' dimension and the 'degree of difficulty' dimension decreases for higher levels. Problems requiring Level 1 processes can more easily be based on distinct subject matter and the difference between easy and hard can be great. Problems that require students to use more levels of cognition tend to also involve making connections with subject matter within and across the domains of mathematics. They are often placed in contexts that require strategic mathematical decisions and making representations according to situation and purpose. At higher levels the difference between easy and hard is smaller (Shafer & Foster 1997; Webb 2009). Students should master basic facts and processes in familiar contexts, routine texts and simple tasks, before moving on to those that are more complex and unfamiliar, at any level.<sup>4</sup>

The assessment pyramid helps visualise what is necessary for a complete assessment program. Problems need to assess a student's growth and achievement in all areas of subject matter and across the full range of objectives. Over time, through a teaching and learning period, students will be exposed to problems that 'fill the pyramid'. Each assessment instrument will reflect this for the relevant subject matter, providing students with the opportunity to demonstrate what they know and can do at all levels of thinking and at varying degrees of difficulty (Shafer & Foster 1997).

## Problem-solving

A key aspect of learning mathematics is to develop strategic competence; that is, to formulate, represent and solve mathematical problems (Kilpatrick, Swafford & Bradford 2001). As such, problem-solving is a focus of mathematics education research, curriculum and teaching (Sullivan 2011). This focus is not to the exclusion of routine exercises, which are necessary for practising, attaining mastery and being able to respond automatically. But mathematics education in the 21st century goes beyond this to include innovative problems that are complex, unfamiliar and non-routine (Mevarech & Kramarski 2014).

Problem-solving is required when a task or goal has limiting conditions placed upon it or an obstacle is blocking the path to a solution (Marzano & Kendall 2007). It involves:

- knowledge of the relevant details
- using generalisations and principles to identify, define and interpret the problem
- mental computation and estimation

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<sup>4</sup> Complex unfamiliar questions that require more levels of cognitive skills should not be equated with elaborate problem-solving tasks only. A single-answer, conventional question such as: 'Find the equation of the line passing through the points (2,1) and (1,3)' can be adapted to a more open-ended question, such as: 'Write the equations of at least five lines passing through the point (2,1)' (Goos 2014). This revised question targets the identical subject matter but provides the possibility of easily identifying diverse student understanding and skills by moving it towards complex unfamiliar questions and assessing more cognitive skills. For further examples, see White et al. (2000).

- critical, creative and lateral thinking
- creating or choosing a strategy
- making decisions
- testing, monitoring and evaluating solutions.

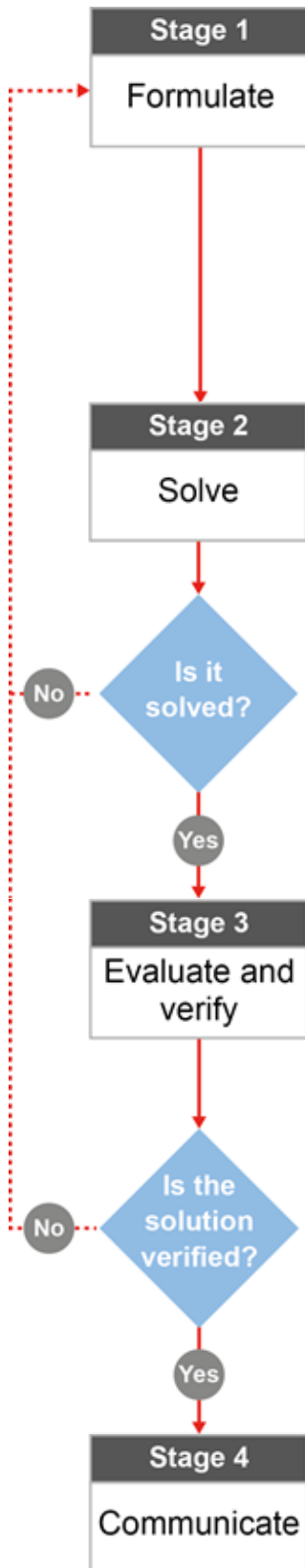
Problem-solving requires students to explain their mathematical thinking and develop strong conceptual foundations. They must do more than follow set procedures and mimic examples without understanding. Through problem-solving, students will make connections between mathematics topics, across the curriculum and with the real world, and see the value and usefulness of mathematics. Problems may be presented to students as issues, statements or questions that may require them to use primary or secondary data.

The following section outlines an approach to problem-solving.<sup>5</sup>

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<sup>5</sup> A wide variety of frameworks for problem-solving exist in mathematics education literature. The approach outlined here aligns with and is informed by other approaches, such as Polya in *How to Solve It: A new aspect of mathematical method* (1957), the Australian Curriculum (2015), *Statistical investigation process, the OECD/PISA Mathematics framework* (OECD 2015, 2003) and 'A framework for success in implementing mathematical modelling in the secondary classroom' (Stillman et al. 2007). For further reading see Blum et al. (2007), Kaiser et al. (2011) and Stillman et al. (2013).

Figure 2: An approach to problem-solving



Once students understand what the problem is asking, they must develop mathematical and problem-solving strategies to answer the problem. Students translate the problem into a mathematically purposeful representation by first determining the applicable mathematical processes and methods that are required to make progress. Appropriate assumptions, variables and observations are identified and documented, based on the logic of a proposed solution.

Students select and use mathematical problem-solving strategies previously learnt to answer the mathematical problem. Solutions can be found using algebraic, graphic, arithmetic and/or numeric methods, with or without technology.

Once a possible solution has been achieved, students need to consider the reasonableness of the solution in terms of the problem. They reflect on the processes used and evaluate outcomes, making a judgment about the solution/s to the problem in relation to the original issue, statement or question.

Where necessary, this will require going back through the process to further refine the solution.

This stage emphasises the importance of methodological rigour and the fact that problem-solving is not usually linear and involves an iterative process.

The development of solutions to real-world problems must be capable of being evaluated and used by others and so needs to be communicated clearly and fully. Students communicate findings systematically and concisely using oral and written mathematical language and representations. They draw conclusions and discuss the key results, framed in the context of the initial problem.

## Approaches to problem-solving in the classroom

When teaching problem-solving, teachers should consider *teaching for* and *learning through* problem-solving. When *teaching for*, students are taught the specific mathematical rules, definitions, procedures, problem-solving strategies and critical elements of the model that are needed to solve a given problem. When *learning through*, students are presented with problems to solve, but must apply the knowledge and skills they have previously been taught to solve them. By solving these problems, students are able to develop new mathematical understanding and skills. This requires an explicit and connected approach to teaching problem-solving that necessitates fluency of critical facts and processes at each step.

The following describes three different approaches to teaching problem-solving along the continua between *teaching for* and *learning through*.<sup>6</sup>

Approach	Description	Teaching for or learning through
<b>Dependent</b>	The teacher explicitly demonstrates and teaches the concepts and techniques required to solve the problem. This usually involves students solving (Figure 2, Stage 2), and evaluating and verifying (Figure 2, Stage 3).	<i>Teaching for</i>
<b>Guided</b>	The teacher influences the choice of concepts and techniques that students use to solve the problem. Significant guidance is provided and all stages of the approach are used.	Moving towards <i>learning through</i>
<b>Independent</b>	The teacher cedes control and students work independently, choosing their own solution and working at their own level of mathematics. The independent approach is the most challenging.	<i>Learning through</i>

These approaches are not mutually exclusive. An independent approach (*learning through*) might be undertaken as an extension of a dependent or guided activity that students have previously undertaken (*teaching for*). Students need to have attained the relevant foundational understanding and skills before working independently during the problem-solving task. This capacity needs to be built over time through the course of study with teachers closely monitoring student progress.

### 1.2.5 Performance variables

A number of variables or factors can affect student performance, and subsequently, their achievement of the course objectives:

- support
- context
- text complexity
- task complexity.

Given the impact of these variables on performance, they must be taken into account when evaluating the level of an assessment task or in determining a student's level of performance.

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<sup>6</sup> Based on Galbraith (1989).

## Supporting students

Some students who undertake this course will be able to embark on independent learning; all will require help and guidance. Scaffolding for tasks should encompass learning experiences that focus on the use and application of mathematical rules, processes and methods.

As an individual develops the skills and confidence associated with being an independent learner, the nature and degree of support required is likely to change. Those operating at the lower levels of the ACSF are likely to need a higher level of support throughout the learning process.

However, an individual operating at a higher ACSF level may also need support when learning something new and challenging. The nature and duration of that assistance may be very different, reflecting the fact that higher-level learners have the capacity to initiate and manage their own support processes.

When used for assessment purposes, the ACSF assumes that an individual at any level is able to demonstrate performance within the support levels described and where the context, text complexity and task complexity are appropriate. If further support is still required, this should be taken into account when benchmarking performance.

Students at ACSF Level 3 are able to work independently and use their own familiar support resources; some may be able to initiate and use support from a range of established resources.

It is the responsibility of teachers to model and provide strategies for the core skills:

- identifying and communicating mathematical information
- approaching and solving mathematical problems
- learning.

## Context

The ACSF acknowledges that the prior knowledge or experience a student brings to a situation, including familiarity with the text, task and topic, can make a significant difference to performance. This is reflected across the five ACSF levels of performance as an individual applies knowledge and skills with increasing confidence and competence within familiar contexts, and learns how to transfer and adapt existing skills to new contexts.

Students working at ACSF Level 3 are expected to work in a range of familiar contexts, and some less familiar contexts, and demonstrate some specialisation in familiar/known contexts.

## Text complexity and selection

Teachers must give students opportunities to engage with a wide range of mathematics texts that are appropriate for students and allow the demonstration of the full range of standards (A–E). The complexity of texts should range from routine to more complex.

Routine texts	Complex texts
May include: <ul style="list-style-type: none"><li>• some <u>unfamiliar</u> elements, embedded information and abstraction</li><li>• some specialised vocabulary.</li></ul>	May include: <ul style="list-style-type: none"><li>• embedded information</li><li>• specialised vocabulary</li><li>• abstraction and symbolism.</li></ul>

The table below provides examples of some text types likely to be found in each topic.

Text type	Topic 1: Personal identity and education	Topic 2: The work environment
procedural	<ul style="list-style-type: none"> <li>instructions for completing a task, including sketch maps</li> <li>operating instructions</li> <li>personal weekly budget displayed in a spreadsheet</li> <li>timetables and fare information</li> </ul>	<ul style="list-style-type: none"> <li>standard operating procedures</li> <li>workplace survey</li> <li>data</li> </ul>
technical	<ul style="list-style-type: none"> <li>survey data and information</li> <li>graphical information on a bill or invoice</li> <li>report on costs, data and information from a utility organisation, e.g. phone, electricity, gas or water</li> </ul>	<ul style="list-style-type: none"> <li>instruction manual for a new piece of equipment</li> <li>workplace catalogue</li> <li>materials or parts list for a particular job</li> </ul>

### Task complexity

At ACSF Level 3, students are expected to engage with tasks that involve a number of steps. Suitable processes will include sequencing, integrating, interpreting, simple extrapolating, simple inferencing and simple abstracting. Students may also be able to operate within a complex task organisation and analysis involving application of a number of steps. Suitable processes will include extracting, extrapolating, inferencing, reflecting and abstracting.

## 1.3 Course organisation

Numeracy is a course of study consisting of two topics:

- Personal identity and education
- The work environment.

These topics provide a context for student learning and experiences and align with the three domains of communication in the ACSF:

- Personal and community, which encompasses
  - expressing personal identity and achieving personal goals
  - understanding and interacting with the wider community
- Education and training, which encompasses
  - any form of structured learning
  - learning towards a formal qualification
  - learning within a language, literacy and numeracy program or community-based program
  - formal or informal on-the-job learning and training
- Workplace and employment, which encompasses activities
  - that an individual may be involved in as a member of an organisation
  - that may be conducted by someone working alone
  - related to preparing for and seeking employment
  - within an existing workplace, including organisational and management tasks.



The Short Course has been developed with a notional teaching, learning and assessment time of 55 hours.

The requirements for a course of study are:

- the syllabus objectives (see Section 2.1)
- the two topics
  - Personal identity and education
  - The work environment
- the two core skills associated with each topic
  - numeracy
  - learning.

### 1.3.1 Planning a course of study

When planning a course of study, teachers should:

- base learning and assessment activities on real-life or lifelike contexts
- align the numeracy curriculum to students' education and career pathways, identified in their Senior Education and Training (SET) Plan
- provide choices in learning contexts and assessment where possible to help cater for students' individual differences
- ensure that students experience all aspects of communication at least once
- ensure learning and assessment opportunities are provided for all objectives at least once.

### 1.3.2 Learning experiences

Learning experiences must be activity-based and life-related. They will typically be practical and spoken/signed. The learning environment will emphasise group interactions and participation, and actively encourage participation and reward effort. Learning experiences should cater for individual differences in personal development, ability, learning styles and interests.

Teachers should expect to provide students with considerable assistance, especially when undertaking new tasks, activities or experiences. Familiarity with a range of social contexts and related numeracy practices, as well as cooperative learning environments, will help students become more self-reliant and less dependent on their teacher's help.

Teachers should use modelling and guidance to enhance student confidence and develop positive attitudes. In all learning experiences, students should be encouraged to use a range of technologies where appropriate and available.

The suggested learning experiences identified in Sections 3.3 and 4.3 are taken from the Level 3 sample activities outlined in the ACSF. The ACSF groups sample activities according to three domains of communication to illustrate how communication varies according to purpose, audience and context. These domains are:

- personal and community
- education and training
- workplace and employment.

These three aspects of communication must be part of the course that a school develops. Students should be provided with learning experiences and assessment opportunities that allow them to demonstrate these aspects of communication.

The ACSF includes additional sample activities. For more information about how ACSF has influenced the shape of this syllabus refer to the companion document, 'Background to the Literacy and Numeracy Short Course Senior Syllabuses' available on the QCAA website [www.qcaa.qld.edu.au/downloads/senior/snr\\_lit\\_num\\_courses\\_10\\_bgd.pdf](http://www.qcaa.qld.edu.au/downloads/senior/snr_lit_num_courses_10_bgd.pdf).

## 1.4 Assessment — general information

### 1.4.1 Summative assessments

Students will complete two summative internal assessments that count towards their overall subject result. Schools develop these assessments based on the learning described in the syllabus.

#### Summative internal assessment — instrument-specific standards

This syllabus provides instrument-specific standards for the two summative internal assessments.

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

#### Criteria

Each instrument-specific standards groups assessment objectives into criteria. An assessment objective may appear in one or multiple criteria of an assessment.

In Numeracy, the following criteria are used:

- Numeracy
- Learning

#### 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.

## 1.5 Exiting a course of study

### 1.5.1 Exit folios

The exit folio is the collection of evidence of student work that is used to determine the student's exit result.

Each folio must include:

- evidence from the two school-developed assessment instruments that demonstrates achievement in numeracy and learning, of which
  - one assessment is an oral mathematical presentation, which includes
    - a student learning journal
  - one assessment is a short response examination, which includes
    - a student learning journal related to the learning in Topic 2: The work environment
- evidence of each objective being assessed at least once (assessment evidence of student achievement of all the objectives must be provided in the student folio)
- a completed student profile.

The 'evidence' includes actual student responses, teacher judgments, an instrument description, instrument-specific standards and annotated teacher comments that support the decisions made.

### 1.5.2 Student profile

The purpose of the student profile is to record student achievement over the course of study. Key elements on the profile include:

- the two topics studied
- the two assessment instruments
- the standard achieved for each instrument.

### 1.5.3 Determining an exit result

When each student exits the course of study, the school is required to determine an A–E exit result for them.

Exit results are summative judgments made when students exit the course of study. Judgments are based on exit folios providing evidence of achievement in relation to all objectives of the syllabus and standards.

### Awarding an exit result

The result awarded at exit is an on-balance judgment about how the qualities of the student's responses to the two assessments match the reporting standards. This means that it is not necessary for the student's responses to have been matched to every characteristic for a particular standard.

## 1.6 Reporting standards

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

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

### Reporting standards

#### A

The student thoughtfully interprets everyday mathematical information from a range of texts, including some that are unfamiliar and complex, and comprehends relevant mathematical knowledge, effectively applying it to everyday life and work activities, in a range of familiar and some less familiar contexts.

The student effectively uses a variety of practical mathematical and problem-solving strategies in a range of familiar and some less familiar contexts to find accurate solutions.

The student demonstrates control of oral and written mathematical language, mathematical conventions, symbolism, abbreviations and diagrammatic representations to communicate mathematical information and problem-solving processes and results, in a range of contexts, including some that are unfamiliar and complex.

The student effectively plans, implements and adjusts processes to achieve learning outcomes in everyday mathematical situations and purposefully applies practical learning strategies in a range of familiar and some less familiar contexts.

#### B

The student appropriately interprets everyday mathematical information from a range of texts, including some that are unfamiliar and complex, and comprehends relevant mathematical knowledge, methodically applying it to everyday life and work activities, in a range of familiar and some less familiar contexts.

The student uses relevant practical mathematical and problem-solving strategies in familiar and some less familiar contexts to find reasonable solutions.

The student demonstrates some control of oral and written mathematical language, mathematical conventions, symbolism, abbreviations and diagrammatic representations to communicate mathematical information and problem-solving processes and results, in a range of contexts, including some that are unfamiliar and complex.

The student logically plans, implements and adjusts processes to achieve learning outcomes in everyday mathematical situations and consistently applies practical learning strategies in a range of familiar and some less familiar contexts.

#### C

The student interprets everyday mathematical information from a range of texts, including some that are unfamiliar and complex, and comprehends relevant mathematical knowledge, applying it to everyday life and work activities, in a range of familiar and some less familiar contexts.

The student uses practical mathematical and problem-solving strategies in familiar and some less familiar contexts to find solutions.

The student uses oral and written mathematical language, mathematical conventions, symbolism, abbreviations and diagrammatic representations to communicate mathematical information and problem-solving processes and results, in a range of familiar and some unfamiliar contexts.

The student plans, implements and adjusts processes to achieve learning outcomes in everyday mathematical situations and applies practical learning strategies in a range of familiar and some less familiar contexts.

## D

The student superficially interprets everyday mathematical information from familiar texts and shows some understanding of mathematical knowledge, but applies it inconsistently to everyday life and work activities.

The student uses some practical mathematical and/or problem-solving strategies in familiar contexts to find solutions that are sometimes inappropriate or irrelevant.

The student uses oral and written mathematical language, mathematical conventions, symbolism, abbreviations and/or diagrammatic representations to communicate mathematical information in familiar contexts, but this communication is often unclear.

The student occasionally plans and implements processes in straightforward everyday mathematical situations and applies some practical learning strategies in simple, familiar and predictable everyday contexts, with variable success.

## E

The student selects isolated aspects of everyday mathematical information but seldom uses this information. They recognise rudimentary mathematical knowledge, but draw minimal meaning from this knowledge and only apply it to everyday life and work activities under direction.

The student makes inaccurate use of isolated aspects of mathematical processes in predictable contexts.

The student seldom uses appropriate mathematical language and rarely plans processes or applies strategies to achieve learning outcomes in numeracy.

# 2 Topic 1: Personal identity and education

## 2.1 Description

In Topic 1, students develop numeracy and learning skills in the contexts of expressing personal identity, achieving personal goals, and understanding and interacting with the wider community.

Students use mathematics to make sense of the world and learn to apply mathematics in a context for a social purpose. They learn to apply numeracy skills and mathematics in structured learning situations, whether learning towards a formal qualification, learning within a community-based program, or formal or informal on-the-job learning and training.

Students should come to understand that learning is a purposeful activity undertaken to achieve objectives that they value. It is an active process of gaining understanding and developing skills that draws on students' prior knowledge and experiences as they shape meaning.

This topic consists of two interrelated core skills:

- numeracy
- learning.

## 2.2 Objectives

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

Students will:

Objective	1A	1B
1. <u>select</u> and <u>interpret</u> mathematical knowledge and skills drawn from number, algebra, measurement, geometry, statistics and probability <u>related</u> to personal, community and education contexts	•	•
2. select from and <u>use</u> a <u>variety</u> of mathematical and problem-solving strategies related to personal, community and education contexts, drawn from number, algebra, measurement, geometry, statistics and probability	•	•
3. use oral and written mathematical language and representation to <u>communicate</u> mathematically in personal, community and education contexts	•	•
4. plan, <u>implement</u> and adjust processes to achieve learning outcomes related to personal, community and education contexts	•	•
5. <u>apply</u> learning strategies as part of education and training.	•	•

## 2.3 Core skill 1: Numeracy

This core skill is about using mathematics to make sense of the world and applying mathematics in a context for a social purpose. Numeracy is concerned with dealing with situations that involve the use and application of a range of mathematical skills and knowledge that arise in the three domains of communication: personal and community, workplace and employment, and education and training.

Numeracy involves understanding and applying mathematical skills. It also involves drawing on knowledge of the context in deciding when to use mathematics, extracting the mathematical information from the context and choosing the appropriate mathematics to use. Numeracy requires reflecting on and evaluating the use of the mathematics, and being able to represent and communicate mathematical results.

### Subject matter

In this core skill, students should:

- select and interpret mathematical information that may be partly embedded in a range of familiar and some less familiar tasks and texts by

#### *Explicitness of mathematical information*

- interpreting and comprehending a range of everyday mathematical information that is embedded in familiar and routine texts

#### *Complexity of mathematical information*

- interpreting and comprehending
  - whole numbers and familiar or routine fractions, decimals and percentages
  - dates and times, including 24-hour times
  - familiar and routine 2D and 3D shapes, including pyramids and cylinders
  - familiar and routine length, mass, volume/capacity, temperature and simple area measures
  - familiar and routine maps and plans
  - familiar and routine data, tables, graphs and charts, and common chance events
- select from and use a variety of mathematical and problem-solving strategies in a range of familiar and some less familiar contexts by

#### *Problem-solving processes including estimating and reflecting*

- drawing on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to
  - select appropriate methods of solution from a limited range of mathematical processes
  - use estimation and other assessment skills to check and reflect on the outcome and its appropriateness to the context and task

#### *Mathematical methods and use of tools*

- using a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate, and using calculator/technological processes and tools to undertake the problem-solving process
- selecting and using appropriate tools, hand-held devices, computers and technological processes, e.g. using a tape measure to measure the dimensions of a window in mm or creating a personal weekly budget in a spreadsheet

#### *Mathematical knowledge and skills: number and algebra*

- calculating with whole numbers and everyday or routine fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only), with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of \$250
- using and applying order of arithmetical operations to solve multi-step calculations
- using and applying rates in familiar or routine situations, e.g. km/hr, \$/kg or \$/m

#### *Mathematical knowledge and skills: measurement and geometry*

- applying knowledge of properties of 2D and 3D shapes to describe and draw everyday objects, including constructing common 3D shapes
- measuring, estimating and calculating length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using  $A = L \times W$ , or estimating area of a non-rectangular

## Subject matter

shape by counting squares)

- identifying and estimating common angles, e.g. as a rotation with a full turn as  $360^\circ$  and recognition of right angles as  $90^\circ$
- converting between routine metric units by applying understanding of common prefixes, e.g. milli, centi or kilo
- using distance, direction, coordinates, simple scales, labels, symbols and keys to read and use everyday maps and plans

*Mathematical knowledge and skills: statistics and probability*

- collecting and organising familiar data and constructing tables, graphs and charts, manually or with spreadsheets, using simple and familiar or routine scales and axes
- describing, comparing and interpreting the likelihood of everyday chance events (e.g. rolling a six on a dice or the chance of rain) using qualitative terms such as certain, likely or impossible, and relating these to everyday or routine fractions, decimals or percentages
- use a combination of both informal and formal oral and written mathematical language and representation to communicate mathematically by

*Written mathematical language*

- using a combination of both informal and formal written mathematical language and symbols and general language to document and report on the mathematical and problem-solving process and results

*Oral mathematical language*

- using a combination of both informal and formal oral mathematical and general language to present and discuss the mathematical and problem-solving process and result

*Complexity of mathematical symbolism, representation and conventions*

- using a combination of both formal and informal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g.
  - $1/100$ , 12.5%
  - km/hr, \$/kg
  - $1.25\text{ m} = 1250\text{ mm}$ .



## 2.4 Core skill 2: Learning

The rapid rate of change affecting all aspects of contemporary life has implications for participation in community, social, training and work spheres. Crucial to adapting to rapidly evolving environments is a student's orientation towards learning, and the range of strategies they can draw on to assist their learning.

A set of key principles underpins this core skill.

- Learning is a purposeful, goal-directed activity, undertaken to achieve objectives that are valued by the student.
- Learning is an active process of gaining understanding and developing skills. Students draw on their prior knowledge and experience as they shape meaning.
- Learning is socially constructed, occurring within, and strongly influenced by, context and culture.
- A student's knowledge and skills are contextualised and do not necessarily transfer neatly from one situation to another without adaptation. Effective transfer requires practice, time and appropriate support.
- Learning does not necessarily occur in a logical, incrementally increasing fashion. Each time students take on a new challenge they are likely to need time, support and resources before their performance improves.
- Learning has cognitive, emotional and social dimensions. Although all individuals learn, not everything that is learned about learning is necessarily positive. Some individuals have developed negative perceptions of themselves as learners. This can act as a barrier to further learning, particularly in formal contexts.

## Subject matter

In this core skill, students should:

- plan, implement and adjust processes to achieve learning outcomes and begin to seek new challenges by

### *Learner identity*

- identifying relevant strengths, weaknesses and needs as a learner, taking these into account in selecting learning options
- recognising some strengths and limitations of preferred approaches to learning and beginning to expand own repertoire
- taking responsibility for routine learning in familiar contexts
- accepting some learning challenges that involve moving outside personal comfort zone
- demonstrating some personal resilience in the face of difficulties, and beginning to recognise that risk taking and making mistakes are essential aspects of learning
- reflecting on actions and outcomes in familiar contexts, and recognising and correcting some errors in performance

### *Goals and pathways*

- identifying personal or career goals and associated learning goals
- identifying appropriate formal or informal learning pathways, and seeking information and advice as required
- developing a formal learning plan to achieve goals, incorporating simple achievable steps and timeframes
- anticipating some potential barriers to learning and identifying several strategies to address these

### *Planning and organising*

- attempting new tasks or activities that may involve simple extrapolation and inferencing
- drawing on prior knowledge to identify the nature and scope of new tasks in routine situations, with some awareness of the need to allow for contextual differences
- developing a sequenced plan for a specific task with prioritised steps and some attention to timelines
- independently accessing a range of support resources
- using ICT-based tools in familiar contexts with some appreciation of their strengths and limitations
- experiment with new learning strategies in familiar contexts and apply some strategies in less familiar contexts by

### *Locating, evaluating and organising information*

- posing some who, what or why questions to help focus an information search
- independently searching the internet, using keywords, simple questions and trial-and-error approaches
- evaluating the reliability of sources in familiar contexts on the basis of a small set of criteria, e.g. directly relevant to purpose or opinion
- beginning to consider the validity of a source, e.g. an opinion or factual text on the internet
- using some personal and/or workplace designed systems for ordering, classifying and storing familiar reference materials for easy retrieval, e.g. naming and dating, or version control

### *Using prior knowledge and scaffolding*

- making some explicit connections between new information or ideas and their own prior knowledge and experience, using techniques like anecdotes and simple analogies
- beginning to transfer key principles and concepts to new situations, allowing for some contextual differences
- using routine 'how to' processes as scaffolding for learning, e.g. manuals or graphic organisers
- using explicit strategies to organise and make connections between information or ideas, e.g. underlining main points or drawing sequencing diagram
- using a range of techniques to reinforce learning, e.g. mnemonics, visualising, rehearsing, summarising or explaining to someone else

### *Learning with and from others*

- identifying own and others' roles in a group or team and making an active contribution
- participating in online collaborations where appropriate, e.g. discussion boards
- demonstrating awareness of different personal and cultural perspectives, and making some attempt to understand and accommodate these
- considering and responding to some advice and feedback on performance from a trusted person.

## 2.5 Assessment

The assessment for this topic consists of two parts:

- an extended response — oral mathematical presentation (Internal assessment 1A)
- a student learning journal (Internal assessment 1B).

### 2.5.1 Internal assessment 1A: Extended response — oral mathematical presentation

#### Description

This assessment focuses on the interpretation, analysis and/or evaluation of ideas and information. It is an independent task responding to a particular problem, situation or stimulus. While students may undertake some research in the preparation of the presentation, it is not the focus of this technique. This assessment occurs over an extended and defined period of time. Students will use class time and their own time to develop a response.

Students are required to investigate and respond to a scenario or context that highlights a real-life application of mathematics. It requires them to use a range of mathematical understandings and skills, and to respond using mathematical, statistical and everyday language, and appropriate calculations, tables of data, graphs and diagrams.

Students may support their responses with visual, audio and/or digital elements, appropriate to the text type.

The presentation, and the accompanying student learning journal, must use subject matter from Topic 1: Personal identity and education.

#### Assessment objectives

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

1. select and interpret mathematical information in personal, social and learning situations
2. select from and use a variety of mathematical and problem-solving strategies in personal, social and learning situations
3. use oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations.

#### Specifications

The presentation requires students to use spoken language to communicate mathematical ideas and information to a live or virtual audience (i.e. through the use of technology) for a particular purpose.

Examples of spoken/oral responses include:

- oral presentations, live or virtual
- digital presentations, e.g. speaking to a webpage with embedded media (graphics, images, audio or video)
- oral delivery of a slideshow or short video clip
- conducting interviews, seminars or webinars
- podcasts
- vodcasts.

## Description

The response is spoken.

## Conditions

- Spoken: 4–6 minutes
- Duration: 5 weeks (including 10 hours of class time).
- Other:
  - opportunity may be provided for group work, but unique responses must be developed by each student
  - use of technology is required; schools must specify the technology used, e.g. scientific calculator, graphics calculator, spreadsheet program and/or other mathematical software; use of technology must go beyond simple computation or word processing
  - the teacher provides the mathematical investigative scenario or context for the oral presentation.

## Examples of reports

- As a consultant for a rainwater tank or solar panel system supplier, you are to visit local new home builders, present a magazine or flyer and do a short presentation to potential buyers on the availability of different types of rainwater tanks or solar panels for particular sized homes. As part of your sales pitch to these customers, you are to present a statistical and financial report that considers the amount of collectable rainfall and water usage at similar sized homes and make a recommendation of the most appropriate rainwater tank for their needs or alternatively make a recommendation for the type of solar panels that a customer could buy based on the exposure to sunlight and personal hot water use.
- As a sports commentator, you are to research and produce a report of your findings of past Olympic, Commonwealth, World and National Championships results and use it to make informed decisions based on the long-term trends via the use of statistics and scatterplots in running or swimming world records such as the 100 m, 200 m, 400 m and 1500 m; use the provided data about the women's or men's 1500 m freestyle world records since year 1980 and predict the approximate year when someone will swim it in under 14 minutes.
- Acting as a sales representative for a telecommunications company, you are to gather information and compile a brochure or leaflet that analyses different mobile phone plans used by students, explore future costings, compare and contrast buying the same model of mobile phone on contract vs. outright and prepaid and do an oral presentation to your classmates as to which mobile plan option/s they should consider for future purchases.
- As a school counsellor or child psychologist, you are asked to produce an informative teleconference, podcast or vodcast to a classroom of teenagers (or year-level assembly) on the social issues and concerns addressed in a detailed report that you have produced on students' internet usage (time, activity, device) compared to the national data provided by the Australian Bureau of Statistics (ABS), and comparing children's participation in different activities (e.g. sport and music) in different countries over a period of time.
- A persuasive argument to present your proposed plan and budget to your parents/caregivers for going on a 'Schoolies' trip or purchasing a car by either borrowing with a bank loan, a payday loan or saving money from a part-time job worked since the end of Year 10, ensuring that concepts of finance are investigated, and compare the overall costs.

## Summary of the criterion to be assessed

The following table summarises the criterion and assessment objectives for the student learning journal.

Criterion	Objectives
Numeracy	1, 2, 3

**Note:** Objectives 4 and 5 are not assessed in this instrument.

## Instrument-specific standards

Numeracy	
The student work has the following characteristics:	Grade
<ul style="list-style-type: none"> <li>• <u>selection</u> and <u>thoughtful interpretation</u> of mathematical information in personal, social and learning situations</li> <li>• selection and <u>use</u> of a <u>variety</u> of <u>effective</u> practical mathematical and problem-solving strategies when <u>applying</u> mathematics in personal, social and learning situations</li> <li>• <u>controlled</u> use of oral and written mathematical language and representation to <u>communicate</u> mathematically when <u>expressing</u> personal identity, achieving personal goals, <u>understanding</u> and interacting with the wider community, and in learning situations.</li> </ul>	<b>A</b>
<ul style="list-style-type: none"> <li>• <u>appropriate</u> selection and interpretation of mathematical information in personal, social and learning situations</li> <li>• selection and use of a variety of <u>relevant</u> mathematical and problem-solving strategies in personal, social and learning situations</li> <li>• some control in the use of oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations.</li> </ul>	<b>B</b>
<ul style="list-style-type: none"> <li>• selection and interpretation of mathematical information in personal, social and learning situations</li> <li>• selection and use of a variety of mathematical and problem-solving strategies in personal, social and learning situations</li> <li>• use of oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations.</li> </ul>	<b>C</b>
<ul style="list-style-type: none"> <li>• selection and <u>superficial</u> interpretation of <u>basic</u> mathematical information in personal, social and/or learning situations</li> <li>• selection and <u>variable</u> use of some practical mathematical and/or problem-solving strategies in personal, social and/or learning situations in <u>inappropriate</u> or irrelevant ways</li> <li>• <u>fragmented</u> and <u>unclear</u> use of oral and written mathematical language and representation in mathematical communication.</li> </ul>	<b>D</b>
<ul style="list-style-type: none"> <li>• use of <u>rudimentary aspects</u> of mathematical information in personal, social and/or learning situations</li> <li>• <u>inaccurate</u> and <u>sporadic</u> use of mathematical strategies information in personal, social and/or learning situations</li> <li>• <u>infrequent</u> and unclear use of mathematical language information in personal, social and/or learning situations.</li> </ul>	<b>E</b>

## 2.5.2 Internal assessment 1B: Student learning journal

### Description

As part of this assessment, students are required to maintain a learning journal that contains a range and balance of entries and activities that represent a selection of reflections on contexts and processes (sociocultural, cognitive and metacognitive) encountered during this topic.

The journal is a purposeful collection of work/writings that helps define students' efforts and achievements in the core skill of learning. It can be used to document a variety of information, ideas, thoughts, learning strategies and working processes, and should contain decisions made and reasons or justifications for these decisions.

### Assessment objectives

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

4. plan, implement and adjust processes to achieve learning outcomes in personal, social and learning situations
5. apply learning strategies in personal, social and learning situations.

### Specifications

The learning journal in this topic consists of individual student responses to, and personal reflections on, their use and application of numeracy and mathematical skills in communications about personal identity, achieving personal goals and interacting with the wider community. It represents thinking and learning practices as they develop across the topic and includes the planning and completion of Internal assessment 1A, the oral mathematical presentation.

The learning journal comprises a range of entries and a record of activities that represent reflections on contexts and processes. It records the student's learning progress and their developing numeracy and mathematical skills. It helps them make sense of what they have been learning as they move towards meeting the objectives of the course and allows them to practice their skills in an open-ended format that encourages the same thought processes that are used in analytical writing.

The act of reflecting on thoughts, ideas, feelings and their own learning encourages the development of metacognitive skills by helping students self-evaluate and sort what they know from what they do not know. The process of examining one's own thoughts and feelings is particularly helpful for students who are learning new concepts or beginning to grapple with complex issues that go beyond right and wrong answers. These reflections could include findings, solved and unsolved problems, analytical and evaluative responses to stimulus materials such as cartoons, newspaper and magazine articles, photos and classroom video/audiotapes.

Through the items selected and the student's individual responses, the learning journal should demonstrate the student's increased awareness and understanding of their own identity as a learner and of their ability to:

- identify strengths, weaknesses and needs as a learner
- take responsibility for their learning and reflect on actions and outcomes
- identify personal and career goals
- plan and organise new tasks, identifying the nature and scope of tasks and developing sequenced plans
- locate, evaluate and organise information, with due consideration to the validity and reliability of sources

- make connections between new information, ideas and their own prior knowledge and experience
- transfer key principles and concepts to new situations
- use strategies to organise and make connections between information and ideas
- use a range of techniques to reinforce learning
- identify own and others' roles in a group or team and make an active contribution
- demonstrate awareness of different personal and cultural perspectives
- consider and respond to advice and feedback on their own performance.

### Conditions

- Mode: The journal may be presented in written, visual and/or digital form.
- Other: The journal may use varied forms of writing such as bullet points, lists, continuous passages of text, quotations, tables, diagrams and pictures/illustrations. It may also contain annotated presentation notes, teacher observation sheets, and self or peer assessment.

### Teacher observations and interviews

This strategy can provide many opportunities for the teacher to record observations of students, assist them in completing tasks, and authenticate their work.

To be able to communicate about issues involving mathematics, students should be encouraged to explain how they are working with given rules, operations, procedures and open-ended problems. This enables teachers to not only assess learning and understanding, but also to diagnose difficulties and provide guidance. Records of observations of the student's explanations can contribute to evidence of their achievements and be included in their folio.

Teachers may wish to conduct interviews with students to determine their orientation towards learning; their ability to plan, implement and adjust processes to achieve learning outcomes; and the range of strategies they draw on to assist their learning.

A question and answer session (teacher and/or class members) at the conclusion of the spoken presentation can also provide information about students' learning and engagement with the task.

### Summary of the criterion to be assessed

The following table summarises the criterion and assessment objectives for the student learning journal.

Criterion	Objectives
Learning	4, 5

**Note:** Objectives 1, 2, 3 are not assessed in this instrument.

## Instrument-specific standards

Learning	
The student work has the following characteristics:	Grade
<ul style="list-style-type: none"> <li>• <u>effective</u> planning, <u>implementation</u> and adjustment of processes to achieve learning outcomes in personal, social and learning situations</li> <li>• <u>purposeful application</u> of learning strategies in personal, social and learning situations.</li> </ul>	<b>A</b>
<ul style="list-style-type: none"> <li>• <u>logical</u> planning, implementation and adjustment of processes to achieve learning outcomes in personal, social and learning situations</li> <li>• <u>consistent</u> application of learning strategies in personal, social and learning situations.</li> </ul>	<b>B</b>
<ul style="list-style-type: none"> <li>• planning, implementation and adjustment of processes to achieve learning outcomes in personal, social and learning situations</li> <li>• application of learning strategies in personal, social and learning situations.</li> </ul>	<b>C</b>
<ul style="list-style-type: none"> <li>• occasional planning, implementation and adjustment of processes to achieve learning outcomes in personal, social and/or learning situations</li> <li>• some application of learning strategies in personal, social and/or learning situations with <u>variable</u> success.</li> </ul>	<b>D</b>
<ul style="list-style-type: none"> <li>• <u>infrequent</u> planning, implementation and adjustment of processes to achieve learning outcomes in personal, social and/or learning situations</li> <li>• <u>isolated</u> application of learning strategies in personal, social and/or learning situations with <u>minimal</u> success.</li> </ul>	<b>E</b>



# 3 Topic 2: The work environment

## 3.1 Description

In Topic 2, students develop their skills of numeracy and learning through activities that relate to preparing for and seeking employment, operating in an existing workplace, and/or entering a new work environment.

They use mathematics to deal with situations in the work environment that involve the use and application of a range of mathematical skills and knowledge.

Students also come to understand that learning is a purposeful activity undertaken to achieve objectives that they value. It is an active process of gaining understanding and developing skills that draws on students' prior knowledge and experiences as they shape meaning.

This topic consists of two interrelated core skills:

- numeracy
- learning.

## 3.2 Objectives

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

Students will:

Objective	2A	2B
1. <u>select</u> and <u>interpret</u> mathematical knowledge and skills <u>related</u> to the work environment, drawn from number, algebra, measurement, geometry, statistics and probability	•	•
2. select from and use a <u>variety</u> of mathematical and problem-solving strategies related to the work environment, drawn from number, algebra, measurement, geometry, statistics and probability	•	•
3. use oral and written mathematical language and representation to <u>communicate</u> mathematically in workplace and employment contexts	•	•
4. plan, <u>implement</u> and adjust processes to achieve learning outcomes related to the work environment	•	•
5. <u>apply</u> learning strategies in workplace and employment contexts.	•	•

### 3.3 Core skill 1: Numeracy

This core skill is about using mathematics to make sense of the world and applying mathematics in a context for a social purpose.

Numeracy is concerned with dealing with situations that involve the use and application of a range of mathematical skills and knowledge that arise in the three domains of communication: personal and community, workplace and employment, and education and training.

Numeracy involves understanding and applying mathematical skills. It also involves drawing on knowledge of the context in deciding when to use mathematics, extracting the mathematical information from the context and choosing the appropriate mathematics to use. Numeracy requires reflecting on and evaluating the use of the mathematics, and being able to represent and communicate the mathematical results.

#### Subject matter

In this core skill, students should:

- select and interpret mathematical information that may be partly embedded in a range of familiar and some less familiar tasks and texts by

##### *Explicitness of mathematical information*

- interpreting and comprehending a range of everyday mathematical information that is embedded in familiar and routine texts

##### *Complexity of mathematical information*

- interpreting and comprehending
  - whole numbers and familiar or routine fractions, decimals and percentages
  - dates and times, including 24-hour times
  - familiar and routine 2D and 3D shapes, including pyramids and cylinders
  - familiar and routine length, mass, volume/capacity, temperature and simple area measures
  - familiar and routine maps and plans
  - familiar and routine data, tables, graphs and charts, and common chance events

- select from and use a variety of mathematical and problem-solving strategies in a range of familiar and some less familiar contexts by

##### *Problem-solving processes including estimating and reflecting*

- drawing on a combination of hands-on, in-context materials, personal experience, and mathematical and other prior knowledge to
  - select appropriate methods of solution from a limited range of mathematical processes
  - use estimation and other assessment skills to check and reflect on the outcome and its appropriateness to the context and task

##### *Mathematical methods and use of tools*

- using a blend of personal ‘in-the-head’ methods and formal pen and paper methods to calculate, and using calculator/technological processes and tools to undertake the problem-solving process
- selecting and using appropriate tools, hand-held devices, computers and technological processes, e.g. using a tape measure to measure the dimensions of a window in mm or creating a personal weekly budget in a spreadsheet

##### *Mathematical knowledge and skills: number and algebra*

- calculating with whole numbers and everyday or routine fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only), with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of \$250
- using and applying order of arithmetical operations to solve multi-step calculations
- using and applying rates in familiar or routine situations, e.g. km/hr, \$/kg or \$/m

##### *Mathematical knowledge and skills: measurement and geometry*

- applying knowledge of properties of 2D and 3D shapes to describe and draw everyday objects, including constructing common 3D shapes
- measuring, estimating and calculating length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using  $A = L \times W$ , or estimating area of a non-rectangular

## Subject matter

shape by counting squares)

- identifying and estimating common angles, e.g. as a rotation with a full turn as  $360^\circ$  and recognition of right angles as  $90^\circ$
- converting between routine metric units by applying understanding of common prefixes, e.g. milli, centi or kilo
- using distance, direction, coordinates, simple scales, labels, symbols and keys to read and use everyday maps and plans

*Mathematical knowledge and skills: statistics and probability*

- collecting and organising familiar data and constructing tables, graphs and charts, manually or with spreadsheets, using simple and familiar or routine scales and axes
- describing, comparing and interpreting the likelihood of everyday chance events (e.g. rolling a six on a dice or the chance of rain) using qualitative terms such as certain, likely or impossible, and relating these to everyday or routine fractions, decimals or percentages
- use a combination of both informal and formal oral and written mathematical language and representation to communicate mathematically by

*Written mathematical language*

- using a combination of both informal and formal written mathematical language and symbols and general language to document and report on the mathematical and problem-solving process and results

*Oral mathematical language*

- using a combination of both informal and formal oral mathematical and general language to present and discuss the mathematical and problem-solving process and result

*Complexity of mathematical symbolism, representation and conventions*

- using a combination of both formal and informal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g.
  - $1/100$ , 12.5%
  - km/hr, \$/kg
  - $1.25\text{ m} = 1250\text{ mm}$ .

## 3.4 Core skill 2: Learning

The rapid rate of change affecting all aspects of contemporary life has implications for participation in community, social, training and work spheres. Crucial to adapting to rapidly evolving environments is a student's orientation towards learning, and the range of strategies they can draw on to assist their learning.

A set of key principles underpins this core skill.

- Learning is a purposeful, goal-directed activity, undertaken to achieve objectives that are valued by the student.
- Learning is an active process of gaining understanding and developing skills. Students draw on their prior knowledge and experience as they shape meaning.
- Learning is socially constructed, occurring within, and strongly influenced by, context and culture.
- A student's knowledge and skills are contextualised and do not necessarily transfer neatly from one situation to another without adaptation. Effective transfer requires practice, time and appropriate support.
- Learning does not necessarily occur in a logical, incrementally increasing fashion. Each time students take on a new challenge they are likely to need time, support and resources before their performance improves.
- Learning has cognitive, emotional and social dimensions. Although all individuals learn, not everything that is learned about learning is necessarily positive. Some individuals have developed negative perceptions of themselves as learners. This can act as a barrier to further learning, particularly in formal contexts.

### Subject matter

In this core skill, students should:

- plan, implement and adjust processes to achieve learning outcomes and begin to seek new challenges by

#### *Learner identity*

- identifying relevant strengths, weaknesses and needs as a learner, and taking these into account in selecting learning options
- recognising some strengths and limitations of preferred approaches to learning and beginning to expand own repertoire
- taking responsibility for routine learning in familiar contexts
- accepting some learning challenges that involve moving outside personal comfort zone
- demonstrating some personal resilience in the face of difficulties, and beginning to recognise that risk taking and making mistakes are essential aspects of learning
- reflecting on actions and outcomes in familiar contexts, recognising and correcting some errors in performance

#### *Goals and pathways*

- identifying personal or career goals and associated learning goals
- identifying appropriate formal or informal learning pathways, seeking information and advice as required
- developing a formal learning plan to achieve goals, incorporating simple achievable steps and timeframes
- anticipating some potential barriers to learning and identifying several strategies to address these

#### *Planning and organising*

- attempting new tasks or activities that may involve simple extrapolation and inferencing
- drawing on prior knowledge to identify the nature and scope of new tasks in routine situations, with some awareness of the need to allow for contextual differences

## Subject matter

- developing a sequenced plan for a specific task with prioritised steps and some attention to timelines
- independently accessing a range of support resources
- using ICT-based tools in familiar contexts with some appreciation of their strengths and limitations
- experiment with new learning strategies in familiar contexts and apply some strategies in less familiar contexts by

### *Locating, evaluating and organising information*

- posing some who, what or why questions to help focus an information search
- independently searching the internet, using key words, simple questions and trial-and-error approaches
- evaluating the reliability of sources in familiar contexts on the basis of a small set of criteria, e.g. directly relevant to purpose or opinion
- beginning to consider the validity of a source, e.g. an opinion or factual text on the internet
- using some personal and/or workplace designed systems for ordering, classifying and storing familiar reference materials for easy retrieval, e.g. naming and dating, or version control

### *Using prior knowledge and scaffolding*

- making some explicit connections between new information, ideas and own prior knowledge and experience, using techniques like anecdotes and simple analogies
- beginning to transfer key principles and concepts to new situations, allowing for some contextual differences
- using routine 'how to' processes as scaffolding for learning, e.g. manuals or graphic organisers
- using explicit strategies to organise and make connections between information and ideas, e.g. underlining main points or drawing a sequencing diagram
- using a range of techniques to reinforce learning, e.g. mnemonics, visualising, rehearsing, summarising or explaining to someone else

### *Learning with and from others*

- identifying own and others' roles in a group or team and making an active contribution
- participating in online collaborations where appropriate, e.g. discussion boards
- demonstrating awareness of different personal and cultural perspectives and making some attempt to understand and accommodate these
- considering and responding to some advice and feedback on performance from a trusted person.

## 3.5 Assessment

The assessment for this topic consists of two parts:

- an examination — short response (Internal assessment 2A)
- a student learning journal (Internal assessment 2B).

### 3.5.1 Internal assessment 2A: Examination — short response

#### Description

This assessment is a supervised test that assesses specific knowledge and understandings and the student's ability to solve problems. Student responses are produced independently, under supervision and in a set timeframe. The conditions of this technique should establish the authenticity of the student work.

The examination may include one or more items. These could be in response to stimulus materials, which may be seen or unseen, or questions, which should be unseen. If, however, a seen question is used, then teachers must ensure the purpose of this technique is not compromised. These conditions must be explained on the assessment instrument.

Unseen materials or questions should not be copied from information or texts that students have previously been exposed to or directly used in class.

When stimulus materials are used they should be succinct enough to allow students sufficient time to engage with them. If the stimulus materials are lengthy, complex or numerous, they may need to be shared with students before the assessment.

The examination, and the accompanying learning journal, must use subject matter from Topic 2: The work environment.

#### Assessment objectives

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

1. select and interpret mathematical information related to the workplace and employment
2. select from and use a variety of mathematical and problem-solving strategies in workplace and employment contexts to solve some problems
3. use written mathematical language and representation to communicate mathematically in workplace and employment contexts.

#### Specifications

Items could include:

- short-response items
  - used to test specific knowledge and understandings
  - items may include response to stimulus or comprehension activities that require
    - explanations of more than one sentence
    - ideas to be maintained, developed and justified
    - students to write in full sentences, constructing a piece of prose that may have one or several paragraphs
  - stimuli materials and questions are unseen

- the length of short-response items should allow students to complete the responses in the set timeframe
- short items requiring single-word, term, matching, true/false or classification, sentence or short paragraph responses
- cloze passages and sentence completion
- practical exercises
- responses to seen or unseen stimulus materials.

### Conditions

- Supervised conditions
- Individual response
- Perusal time or planning time may be required
- Time: 60 minutes, plus 5 minutes perusal
- If computers are used, ensure that the purpose of this instrument is maintained.
- Open book or notes may be allowed; these conditions must be clearly outlined on the assessment instrument.

### Summary of the criterion to be assessed

The following table summarises the criterion and assessment objectives for the examination.

Criterion	Objectives
Numeracy	1, 2, 3

**Note:** Objectives 4 and 5 are not assessed in this instrument.

## Instrument-specific standards

Numeracy	
The student work has the following characteristics:	Grade
<ul style="list-style-type: none"> <li>• <u>selection</u> and <u>thoughtful interpretation</u> of mathematical information <u>related</u> to the workplace and employment</li> <li>• <u>accurate</u> selection and <u>use</u> of a <u>variety</u> of <u>effective</u> practical mathematical and problem-solving strategies when <u>applying</u> mathematics in workplace and employment contexts to <u>solve</u> problems</li> <li>• <u>controlled</u> use of written mathematical language and representation to <u>communicate</u> mathematically in workplace and employment contexts.</li> </ul>	<b>A</b>
<ul style="list-style-type: none"> <li>• <u>appropriate</u> selection and interpretation of mathematical information related to the workplace and employment</li> <li>• selection and of a variety of <u>relevant</u> mathematical and problem-solving strategies in workplace and employment contexts to solve problems</li> <li>• some <u>control</u> in the use of written mathematical language and representation to communicate mathematically in workplace and employment contexts.</li> </ul>	<b>B</b>
<ul style="list-style-type: none"> <li>• selection and interpretation of mathematical information related to the workplace and employment</li> <li>• selection and use of a variety of mathematical and problem-solving strategies in workplace and employment contexts to solve some problems</li> <li>• use of written mathematical language and representation to communicate mathematically in workplace and employment contexts.</li> </ul>	<b>C</b>
<ul style="list-style-type: none"> <li>• selection and <u>superficial</u> interpretation of <u>basic</u> mathematical information related to the workplace and employment</li> <li>• selection and <u>variable</u> use of some practical mathematical and/or problem-solving strategies in workplace and employment contexts to make some progress</li> <li>• <u>fragmented</u> and <u>unclear</u> use of written mathematical language and representation in mathematical communication in workplace and employment contexts.</li> </ul>	<b>D</b>
<ul style="list-style-type: none"> <li>• use of <u>rudimentary aspects</u> of mathematical information related to the workplace and employment</li> <li>• <u>inaccurate</u> and <u>sporadic</u> use of mathematical strategies in workplace and employment contexts</li> <li>• <u>infrequent</u> and unclear use of mathematical language in workplace and employment contexts.</li> </ul>	<b>E</b>



## 3.5.2 Internal assessment 2B: Student learning journal

### Description

As part of this assessment, students are required to maintain a learning journal that contains a range and balance of entries and activities that represent a selection of reflections on contexts and processes (sociocultural, cognitive and metacognitive) encountered during this topic.

The student learning journal is a purposeful collection of work and writings that helps define students' efforts and achievements in the core skill of learning. It can be used to document a variety of information, ideas, thoughts, learning (strategies) and working processes, and should contain decisions made and reasons or justifications for these decisions.

### Assessment objectives

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

4. plan, implement and adjust processes to achieve learning outcomes in workplace and employment contexts
5. apply learning strategies in workplace and employment contexts.

### Specifications

The learning journal in this topic consists of individual student responses to, and personal reflections on, their use and application of numeracy and mathematical skills in communications about personal identity, achieving personal goals, and interacting with the wider community. It represents thinking and learning practices as they develop across the topic.

A learning journal comprises a range of entries and a record of activities that represent reflections on contexts and processes. It records the student's learning progress and their developing numeracy and mathematical skills. It helps students make sense of what they have been learning as they move towards meeting the objectives of the course. The journal also allows them to practice their skills in an open-ended format that encourages the same thought processes that are used in analytical writing.

The act of reflecting on thoughts, ideas, feelings and their own learning encourages the development of metacognitive skills by helping students self-evaluate and sort what they know from what they do not know. The process of examining one's own thoughts and feelings is particularly helpful for students who are learning new concepts or beginning to grapple with complex issues that go beyond right and wrong answers. These reflections could include findings, solved and unsolved problems, and analytical and evaluative responses to stimulus materials such as cartoons, newspaper and magazine articles, photos and classroom video/audiotapes.

Through the items selected for inclusion, and the student's responses, the learning journal should demonstrate a student's ability to:

- identify strengths, weaknesses and needs as a learner
- take responsibility for their learning and reflect on actions and outcomes
- identify personal and career goals
- plan and organise new tasks, identifying the nature and scope of tasks and developing sequenced plans
- locate, evaluate and organise information, with due consideration to the validity and reliability of sources

- make connections between new information, ideas and their own prior knowledge and experience
- transfer key principles and concepts to new situations
- use strategies to organise and make connections between information and ideas
- use a range of techniques to reinforce learning
- identify own and others' roles in a group or team and make an active contribution
- demonstrate awareness of different personal and cultural perspectives
- consider and respond to advice and feedback on their own performance.

### Conditions

- Mode: The journal may be presented in written, visual and/or digital form.
- Other: The journal may use varied forms of writing such as bullet points, lists, continuous passages of text, quotations, tables, diagrams and pictures/illustrations.

### Teacher observations and interviews

This strategy can provide many opportunities for the teacher to record observations of students, assist them in completing tasks and authenticate their work.

To be able to communicate about issues involving mathematics, students should be encouraged to explain how they are working with given rules, operations, procedures and open-ended problems. This enables teachers to not only assess learning and understanding, but also to diagnose difficulties and provide guidance. Records of observations of the student's explanations can contribute to evidence of their achievements and be included in their folio.

Teachers may wish to conduct interviews with students to determine their orientation towards learning; their ability to plan, implement and adjust processes to achieve learning outcomes; and the range of strategies they draw on to assist their learning.

A question and answer session (teacher and/or class members) after the examination can also provide information about students' learning and engagement with the task.

### Summary of the criterion to be assessed

The following table summarises the criterion and assessment objectives for the student learning journal.

Criterion	Objectives
Learning	4, 5

**Note:** Objectives 1, 2 and 3 are not assessed in this instrument.

## Instrument-specific standards

Learning	
The student work has the following characteristics:	Grade
<ul style="list-style-type: none"> <li>• <u>effective</u> planning, <u>implementation</u> and adjustment of processes to achieve learning outcomes in workplace and employment contexts</li> <li>• <u>purposeful application</u> of learning strategies in workplace and employment contexts.</li> </ul>	<b>A</b>
<ul style="list-style-type: none"> <li>• <u>logical</u> planning, implementation and adjustment of processes to achieve learning outcomes in workplace and employment contexts</li> <li>• <u>consistent</u> application of learning strategies in workplace and employment contexts.</li> </ul>	<b>B</b>
<ul style="list-style-type: none"> <li>• planning, implementation and adjustment of processes to achieve learning outcomes in workplace and employment contexts</li> <li>• application of learning strategies in workplace and employment contexts.</li> </ul>	<b>C</b>
<ul style="list-style-type: none"> <li>• occasional planning, implementation and adjustment of processes to achieve learning outcomes in workplace and employment contexts</li> <li>• some application of learning strategies with <u>variable</u> success in workplace and employment contexts.</li> </ul>	<b>D</b>
<ul style="list-style-type: none"> <li>• <u>infrequent</u> planning, implementation and adjustment of processes to achieve learning outcomes in workplace and employment contexts</li> <li>• <u>isolated</u> application of learning strategies in workplace and employment contexts.</li> </ul>	<b>E</b>

## 4 Glossary

Term	Explanation
<b>A</b>	
<b>accomplished</b>	highly trained or skilled in a particular activity; perfected in knowledge or training; expert
<b>accuracy</b>	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
<b>accurate</b>	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
<b>ACSF</b>	ACSF; a tool that assists both specialist and non-specialist English language, literacy and numeracy practitioners describe an individual's performance in the five core skills of learning, reading, writing, oral communication and numeracy; developed to facilitate a consistent national approach to the identification and development of the core skills in diverse personal, community, work, and education and training contexts
<b>adept</b>	very/highly skilled or proficient at something; expert
<b>adequate</b>	satisfactory or acceptable in quality or quantity equal to the requirement or occasion
<b>analyse</b>	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
<b>applied learning</b>	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
<b>Applied subject</b>	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
<b>apply</b>	use knowledge and understanding in response to a given situation or circumstance; carry out or use a procedure in a given or particular situation

Term	Explanation
<b>appraise</b>	evaluate the worth, significance or status of something; judge or consider a text or piece of work
<b>appreciate</b>	recognise or make a judgment about the value or worth of something; understand fully; grasp the full implications of
<b>appropriate</b>	acceptable; suitable or fitting for a particular purpose, circumstance, context, etc.
<b>apt</b>	suitable to the purpose or occasion; fitting, appropriate
<b>area of study</b>	a division of, or a section within a unit
<b>argue</b>	give reasons for or against something; challenge or debate an issue or idea; persuade, prove or try to prove by giving reasons
<b>aspect</b>	a particular part of a feature of something; a facet, phase or part of a whole
<b>assess</b>	measure, determine, evaluate, estimate or make a judgment about the value, quality, outcomes, results, size, significance, nature or extent of something
<b>assessment</b>	purposeful and systematic collection of information about students' achievements
<b>assessment instrument</b>	a tool or device used to gather information about student achievement
<b>assessment objectives</b>	drawn from the unit or topic objectives and contextualised for the requirements of the assessment instrument (see also 'syllabus objectives', 'unit objectives')
<b>assessment technique</b>	the method used to gather evidence about student achievement, (e.g. examination, project, investigation)
<b>astute</b>	showing an ability to accurately assess situations or people; of keen discernment
<b>ATAR</b>	Australian Tertiary Admission Rank
<b>Australian Core Skills Framework</b>	ACSF; a tool that assists both specialist and non-specialist English language, literacy and numeracy practitioners describe an individual's performance in the five core skills of learning, reading, writing, oral communication and numeracy; developed to facilitate a consistent national approach to the identification and development of the core skills in diverse personal, community, work, and education and training contexts
<b>authentic learning</b>	learning that is based in real-life or lifelike contexts and that has meaning and purpose in the life of students
<b>authoritative</b>	able to be trusted as being accurate or true; reliable; commanding and self-confident; likely to be respected and obeyed
<b>B</b>	
<b>balanced</b>	keeping or showing a balance; not biased; fairly judged or presented; taking everything into account in a fair, well-judged way
<b>basic</b>	fundamental

Term	Explanation
<b>C</b>	
<b>calculate</b>	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
<b>categorise</b>	place in or assign to a particular class or group; arrange or order by classes or categories; classify, sort out, sort, separate
<b>challenging</b>	difficult but interesting; testing one's abilities; demanding and thought-provoking; usually involving unfamiliar or less familiar elements
<b>characteristic</b>	a typical feature or quality
<b>clarify</b>	make clear or intelligible; explain; make a statement or situation less confused and more comprehensible
<b>clarity</b>	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
<b>classify</b>	arrange, distribute or order in classes or categories according to shared qualities or characteristics
<b>clear</b>	free from confusion, uncertainty, or doubt; easily seen, heard or understood
<b>clearly</b>	in a clear manner; plainly and openly, without ambiguity
<b>coherent</b>	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
<b>cohesive</b>	characterised by being united, bound together or having integrated meaning; forming a united whole
<b>comment</b>	express an opinion, observation or reaction in speech or writing; give a judgment based on a given statement or result of a calculation
<b>communicate</b>	convey knowledge and/or understandings to others; make known; transmit
<b>compare</b>	display recognition of similarities and differences and recognise the significance of these similarities and differences
<b>competent</b>	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
<b>competently</b>	in an efficient and capable way; in an acceptable and satisfactory, though not outstanding, way

Term	Explanation
<b>complex</b>	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
<b>comprehend</b>	understand the meaning or nature of; grasp mentally
<b>comprehensive</b>	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
<b>concise</b>	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
<b>concisely</b>	in a way that is brief but comprehensive; expressing much in few words; clearly and succinctly
<b>conduct</b>	direct in action or course; manage; organise; carry out
<b>consider</b>	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
<b>considerable</b>	fairly large or great; thought about deliberately and with a purpose
<b>considered</b>	formed after careful and deliberate thought
<b>consistent</b>	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
<b>construct</b>	create or put together (e.g. an argument) by arranging ideas or items; display information in a diagrammatic or logical form; make; build
<b>contrast</b>	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
<b>controlled</b>	shows the exercise of restraint or direction over; held in check; restrained, managed or kept within certain bounds; in command of
<b>conventions of communication</b>	rules that govern the way we write and speak and that suit the purpose of the text and the intended audience (e.g. formal or informal language)
<b>convincing</b>	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

Term	Explanation
<b>core skill</b>	an ability or specific competence considered essential for individuals to participate effectively in society and the workplace; linked to the physical, social and economic wellbeing of individuals, workplace productivity, safety, community interaction and capacity; the five core skills described in the Australian Core Skills Framework (ACSF) are learning, reading, writing, oral communication and numeracy
<b>course</b>	a defined amount of learning developed from a subject syllabus or alternative sequence
<b>create</b>	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
<b>creative</b>	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
<b>credible</b>	capable or worthy of being believed; believable; convincing
<b>criterion</b>	the property or characteristic by which something is judged or appraised
<b>critical</b>	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
<b>critique</b>	review (e.g. a theory, practice, performance) in a detailed, analytical and critical way
<b>cursory</b>	hasty, and therefore not thorough or detailed; performed with little attention to detail; going rapidly over something, without noticing details; hasty; superficial
<b>D</b>	
<b>decide</b>	reach a resolution as a result of consideration; make a choice from a number of alternatives
<b>deduce</b>	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
<b>defensible</b>	justifiable by argument; capable of being defended in argument
<b>define</b>	give the meaning of a word, phrase, concept or physical quantity; state meaning and identify or describe qualities
<b>demonstrate</b>	prove or make clear by argument, reasoning or evidence, illustrating with practical example; show by example; give a practical exhibition
<b>derive</b>	arrive at by reasoning; manipulate a mathematical relationship to give a new equation or relationship; in mathematics, obtain the derivative of a function



Term	Explanation
<b>describe</b>	give an account (written or spoken) of a situation, event, pattern or process, or of the characteristics or features of something
<b>design</b>	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)
<b>detailed</b>	executed with great attention to the fine points; meticulous; including many of the parts or facts
<b>determine</b>	establish, conclude or ascertain after consideration, observation, investigation or calculation; decide or come to a resolution
<b>develop</b>	elaborate, expand or enlarge in detail; add detail and fullness to; cause to become more complex or intricate
<b>devise</b>	think out; plan; contrive; invent
<b>differentiate</b>	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
<b>discerning</b>	discriminating; showing intellectual perception; showing good judgment; making thoughtful and astute choices; selected for value or relevance
<b>discriminate</b>	note, observe or recognise a difference; make or constitute a distinction in or between; differentiate; note or distinguish as different
<b>discriminating</b>	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
<b>discuss</b>	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
<b>disjointed</b>	disconnected; incoherent; lacking a coherent order/sequence or connection
<b>distinguish</b>	recognise as distinct or different; note points of difference between; discriminate; discern; make clear a difference/s between two or more concepts or items
<b>diverse</b>	of various kinds or forms; different from each other
<b>document</b>	support (e.g. an assertion, claim, statement) with evidence (e.g. decisive information, written references, citations)
<b>draw conclusions</b>	make a judgment based on reasoning and evidence

Term	Explanation
<b>E</b>	
<b>effective</b>	successful in producing the intended, desired or expected result; meeting the assigned purpose
<b>efficient</b>	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
<b>element</b>	a component or constituent part of a complex whole; a fundamental, essential or irreducible part of a composite entity
<b>elementary</b>	simple or uncompounded; relating to or dealing with elements, rudiments or first principles (of a subject); of the most basic kind; straightforward and uncomplicated
<b>erroneous</b>	based on or containing error; mistaken; incorrect
<b>essential</b>	absolutely necessary; indispensable; of critical importance for achieving something
<b>evaluate</b>	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
<b>examination</b>	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
<b>examine</b>	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
<b>experiment</b>	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
<b>explain</b>	make an idea or situation plain or clear by describing it in more detail or revealing relevant facts; give an account; provide additional information
<b>explicit</b>	clearly and distinctly expressing all that is meant; unequivocal; clearly developed or formulated; leaving nothing merely implied or suggested
<b>explore</b>	look into both closely and broadly; scrutinise; inquire into or discuss something in detail
<b>express</b>	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

Term	Explanation
<b>extended response</b>	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
<b>Extension subject</b>	a two-unit subject for which a syllabus has been developed by the QCAA, that is an extension of one or more General or Alternative sequence subject/s, studied concurrently with, or after the completion of, the final two units of that subject
<b>extensive</b>	of great extent; wide; broad; far-reaching; comprehensive; lengthy; detailed; large in amount or scale
<b>external assessment</b>	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
<b>external examination</b>	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
<b>extrapolate</b>	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
<b>F</b>	
<b>factual</b>	relating to or based on facts; concerned with what is actually the case; actually occurring; having verified existence
<b>familiar</b>	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
<b>feasible</b>	capable of being achieved, accomplished or put into effect; reasonable enough to be believed or accepted; probable; likely
<b>fluent</b>	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
<b>fluently</b>	in a graceful and seemingly effortless manner; in a way that progresses smoothly and readily
<b>formative assessment</b>	assessment whose major purpose is to improve teaching and student achievement
<b>fragmented</b>	disorganised; broken down; disjointed or isolated
<b>frequent</b>	happening or occurring often at short intervals; constant, habitual, or regular

Term	Explanation
<b>fundamental</b>	forming a necessary base or core; of central importance; affecting or relating to the essential nature of something; part of a foundation or basis
<b>G</b>	
<b>General subject</b>	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
<b>generate</b>	produce; create; bring into existence
<b>H</b>	
<b>hypothesise</b>	formulate a supposition to account for known facts or observed occurrences; conjecture, theorise, speculate; especially on uncertain or tentative grounds
<b>I</b>	
<b>identify</b>	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
<b>illogical</b>	lacking sense or sound reasoning; contrary to or disregarding the rules of logic; unreasonable
<b>implement</b>	put something into effect, e.g. a plan or proposal
<b>implicit</b>	implied, rather than expressly stated; not plainly expressed; capable of being inferred from something else
<b>improbable</b>	not probable; unlikely to be true or to happen; not easy to believe
<b>inaccurate</b>	not accurate
<b>inappropriate</b>	not suitable or proper in the circumstances
<b>inconsistent</b>	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
<b>independent</b>	thinking or acting for oneself, not influenced by others
<b>in-depth</b>	comprehensive and with thorough coverage; extensive or profound; well-balanced or fully developed
<b>infer</b>	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
<b>informed</b>	knowledgeable; learned; having relevant knowledge; being conversant with the topic; based on an understanding of the facts of the situation (of a decision or judgment)
<b>infrequent</b>	happening or occurring at long intervals or not often; not constant, habitual or regular

Term	Explanation
<b>innovative</b>	new and original; introducing new ideas; original and creative in thinking
<b>insightful</b>	showing understanding of a situation or process; understanding relationships in complex situations; informed by observation and deduction
<b>instrument-specific marking guide</b>	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')
<b>instrument-specific standards</b>	describe the characteristics evident in student responses and align with the identified assessment objectives
<b>integral</b>	<i>adjective</i> necessary for the completeness of the whole; essential or fundamental; <i>noun</i> in mathematics, the result of integration; an expression from which a given function, equation, or system of equations is derived by differentiation
<b>intended</b>	designed; meant; done on purpose; intentional
<b>internal assessment</b>	assessments that are developed by schools; summative internal assessments are endorsed by the QCAA before use in schools and results externally confirmed contribute towards a student's final result
<b>interpret</b>	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
<b>investigate</b>	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
<b>investigation</b>	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
<b>irrelevant</b>	not relevant; not applicable or pertinent; not connected with or relevant to something
<b>ISMG</b>	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')

Term	Explanation
<b>isolated</b>	detached, separate, or unconnected with other things; one-off; something set apart or characterised as different in some way
<b>J</b>	
<b>judge</b>	form an opinion or conclusion about; apply both procedural and deliberative operations to make a determination
<b>justified</b>	sound reasons or evidence are provided to support an argument, statement or conclusion
<b>justify</b>	give reasons or evidence to support an answer, response or conclusion; show or prove how an argument, statement or conclusion is right or reasonable
<b>L</b>	
<b>lateral</b>	(of thinking) a way of thinking that seeks the solution to a problem by making associations with other apparently unrelated areas, rather than by pursuing one logical train of thought
<b>learning area</b>	a grouping of subjects, with related characteristics, within a broad field of learning, e.g. the Arts, sciences, languages
<b>logical</b>	rational and <u>valid</u> ; 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
<b>logically</b>	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
<b>M</b>	
<b>make decisions</b>	select from available options; weigh up positives and negatives of each option and consider all the alternatives to arrive at a position
<b>manipulate</b>	adapt or change to suit one's purpose
<b>mental procedures</b>	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)
<b>methodical</b>	performed, disposed or acting in a systematic way; orderly; characterised by method or order; performed or carried out systematically
<b>minimal</b>	least possible; small, the least amount; negligible
<b>modify</b>	change the form or qualities of; make partial or minor changes to something
<b>multimodal</b>	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

Term	Explanation
	modes are integrated so that each mode contributes significantly to the response
<b>N</b>	
<b>narrow</b>	limited in range or scope; lacking breadth of view; limited in amount; barely sufficient or adequate; restricted
<b>non-verbal communication</b>	communication without the use of words; may include gestures, body language or posture, facial expressions, touch or eye contact
<b>nuanced</b>	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
<b>O</b>	
<b>objectives</b>	see 'syllabus objectives', 'unit objectives', 'assessment objectives'
<b>obvious</b>	clearly perceptible or evident; easily seen, recognised or understood
<b>optimal</b>	best, most favourable, under a particular set of circumstances
<b>organise</b>	arrange, order; form as or into a whole consisting of interdependent or coordinated parts, especially for harmonious or united action
<b>organised</b>	systematically ordered and arranged; having a formal organisational structure to arrange, coordinate and carry out activities
<b>outstanding</b>	exceptionally good; clearly noticeable; prominent; conspicuous; striking
<b>P</b>	
<b>partial</b>	not total or general; existing only in part; attempted, but incomplete
<b>particular</b>	distinguished or different from others or from the ordinary; noteworthy
<b>perceptive</b>	having or showing insight and the ability to perceive or understand; discerning (see also 'discriminating')
<b>performance</b>	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
<b>persuasive</b>	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')

Term	Explanation
<b>perusal time</b>	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
<b>planning time</b>	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
<b>polished</b>	flawless or excellent; performed with skilful ease
<b>precise</b>	definite or exact; definitely or strictly stated, defined or fixed; characterised by definite or exact expression or execution
<b>precision</b>	accuracy; exactness; exact observance of forms in conduct or actions
<b>predict</b>	give an expected result of an upcoming action or event; suggest what may happen based on available information
<b>product</b>	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
<b>proficient</b>	well advanced or expert in any art, science or subject; competent, skilled or adept in doing or using something
<b>project</b>	an assessment technique that focuses 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
<b>propose</b>	put forward (e.g. a point of view, idea, argument, suggestion) for consideration or action
<b>prove</b>	use a sequence of steps to obtain the required result in a formal way
<b>psychomotor procedures</b>	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)
<b>purposeful</b>	having an intended or desired result; having a useful purpose; determined; resolute; full of meaning; significant; intentional
<b>Q</b>	
<b>QCE</b>	Queensland Certificate of Education



Term	Explanation
<b>R</b>	
<b>realise</b>	create or make (e.g. a musical, artistic or dramatic work); actualise; make real or concrete; give reality or substance to
<b>reasonable</b>	endowed with reason; having sound judgment; fair and sensible; based on good sense; average; appropriate, moderate
<b>reasoned</b>	logical and sound; based on logic or good sense; logically thought out and presented with justification; guided by reason; well-grounded; considered
<b>recall</b>	remember; present remembered ideas, facts or experiences; bring something back into thought, attention or into one's mind
<b>recognise</b>	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
<b>refined</b>	developed or improved so as to be precise, exact or subtle
<b>reflect on</b>	think about deeply and carefully
<b>rehearsed</b>	practised; previously experienced; practised extensively
<b>related</b>	associated with or linked to
<b>relevance</b>	being related to the matter at hand
<b>relevant</b>	bearing upon or connected with the matter in hand; to the purpose; applicable and pertinent; having a direct bearing on
<b>repetitive</b>	containing or characterised by repetition, especially when unnecessary or tiresome
<b>reporting</b>	providing information that succinctly describes student performance at different junctures throughout a course of study
<b>resolve</b>	in the Arts, consolidate and communicate intent through a synthesis of ideas and application of media to express meaning
<b>routine</b>	often encountered, previously experienced; commonplace; customary and regular; well-practised; performed as part of a regular procedure, rather than for a special reason
<b>rudimentary</b>	relating to rudiments or first principles; elementary; undeveloped; involving or limited to basic principles; relating to an immature, undeveloped or basic form

Term	Explanation
<b>S</b>	
<b>SAE</b>	Standard Australian English; the form of Australian English that conforms to the perceived notion of appropriate usages for serious writing; it is English which, in its spoken and written forms, is the English of more formal communication throughout the Australian community; it adheres to broadly accepted rules of syntax and pronunciation and uses vocabulary that is more formal than colloquial; SAE operates to facilitate communication across ethnic, social, occupational and cultural groups and can be used as a benchmark against which to recognise Australian dialects and cultural varieties of English
<b>safe</b>	secure; not risky
<b>secure</b>	sure; certain; able to be counted on; self-confident; poised; dependable; confident; assured; not liable to fail
<b>select</b>	choose in preference to another or others; pick out
<b>sensitive</b>	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
<b>sequence</b>	place in a continuous or connected series; arrange in a particular order
<b>Short Course</b>	a one-unit or 55 hour course developed to meet a specific curriculum need; results from Short Courses contribute one credit to a QCE
<b>show</b>	provide the relevant reasoning to support a response
<b>significant</b>	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
<b>simple</b>	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
<b>simplistic</b>	characterised by extreme simplification, especially if misleading; oversimplified
<b>sketch</b>	execute a drawing or painting in simple form, giving essential features but not necessarily with detail or accuracy; in mathematics, 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
<b>skilful</b>	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

Term	Explanation
<b>skilled</b>	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
<b>solve</b>	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
<b>sophisticated</b>	of intellectual complexity; reflecting a high degree of skill, intelligence, etc.; employing advanced or refined methods or concepts; highly developed or complicated
<b>specific</b>	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.
<b>sporadic</b>	happening now and again or at intervals; irregular or occasional; appearing in scattered or isolated instances
<b>straightforward</b>	without difficulty; uncomplicated; direct; easy to do or understand
<b>structure</b>	<i>verb</i> give a pattern, organisation or arrangement to; construct or arrange according to a plan; <i>noun</i> 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
<b>structured</b>	organised or arranged so as to produce a desired result
<b>subject</b>	a branch or area of knowledge or learning defined by a syllabus or alternative sequence; school subjects are usually based in a discipline or field of study (see also 'course')
<b>subject matter</b>	the subject-specific body of information, mental procedures and psychomotor procedures that are necessary for students' learning and engagement within that subject
<b>substantial</b>	of ample or considerable amount, quantity, size, etc.; of real worth or value; firmly or solidly established; of real significance; reliable; important; worthwhile
<b>substantiated</b>	established by proof or competent evidence
<b>subtle</b>	fine or delicate in meaning or intent; making use of indirect methods; not straightforward or obvious
<b>successful</b>	achieving or having achieved success; accomplishing a desired aim or result
<b>succinct</b>	expressed in few words; concise; terse; characterised by conciseness or brevity; brief and clear
<b>sufficient</b>	enough or adequate for the purpose

Term	Explanation
<b>suitable</b>	appropriate; fitting; conforming or agreeing in nature, condition, or action
<b>summarise</b>	give a brief statement of a general theme or major point/s; present ideas and information in fewer words and in sequence
<b>summative assessment</b>	assessment whose major purpose is to indicate student achievement; summative assessments contribute towards a student's subject result
<b>superficial</b>	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
<b>supported</b>	corroborated; given greater credibility by providing evidence
<b>sustained</b>	carried on continuously, without interruption, or without any diminishing of intensity or extent
<b>syllabus</b>	a document that prescribes the curriculum for a course of study
<b>syllabus objectives</b>	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')
<b>symbolise</b>	represent or identify by a symbol or symbols
<b>synthesise</b>	combine different parts or elements (e.g. information, ideas, components) into a whole, in order to create new understanding
<b>systematic</b>	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
<b>T</b>	
<b>test</b>	take measures to check the quality, performance or reliability of something
<b>text</b>	a communication of meaning, produced in any medium, that incorporates language, including sound, print, film, digital and multimedia representations; texts include written, spoken/signed, non-verbal and visual communications of meaning; they may be extended unified works or a series of related pieces; in the ACSF, texts include written, diagrammatic, visual and oral texts, and real life objects and materials
<b>text type</b>	the particular structure, convention and pattern of a piece of text; the text type chosen is determined by the text's purpose, audience, context and culture; text types include procedural, persuasive, narrative, creative, report, informative, technical, descriptive and argument
<b>textual features</b>	micro-features of text (e.g. spelling)

Term	Explanation
<b>thorough</b>	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
<b>thoughtful</b>	occupied with, or given to thought; contemplative; meditative; reflective; characterised by or manifesting thought
<b>topic</b>	a division of, or sub-section within a unit; all topics/sub-topics within a unit are interrelated
<b>U</b>	
<b>unclear</b>	not clear or distinct; not easy to understand; obscure
<b>understand</b>	perceive what is meant by something; grasp; be familiar with (e.g. an idea); construct meaning from messages, including oral, written and graphic communication
<b>uneven</b>	unequal; not properly corresponding or agreeing; irregular; varying; not uniform; not equally balanced
<b>unfamiliar</b>	not previously encountered; situations or materials that have not been the focus of prior learning experiences or activities
<b>unit</b>	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
<b>unit objectives</b>	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')
<b>unrelated</b>	having no relationship; unconnected
<b>use</b>	operate or put into effect; apply knowledge or rules to put theory into practice
<b>V</b>	
<b>vague</b>	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
<b>valid</b>	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
<b>variable</b>	<i>adjective</i> apt or liable to vary or change; changeable; inconsistent; (readily) susceptible or capable of variation; fluctuating, uncertain; <i>noun</i> in mathematics, a symbol, or the quantity it signifies, that may represent any one of a given set of numbers and other objects

Term	Explanation
<b>variety</b>	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
<b>W</b>	
<b>wide</b>	of great range or scope; embracing a great number or variety of subjects, cases, etc.; of full extent
<b>with expression</b>	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

## 5 References

- Australian Curriculum and Assessment Authority (ACARA) 2015, Australian Curriculum Senior Secondary Curriculum: General Mathematics, version 7.5, <http://v7-5.australiancurriculum.edu.au/seniorsecondary/mathematics/generalmathematics/curriculum/seniorsecondary>.
- Australian Government, Department of Education and Training 2012 *Australian Core Skills Framework* (ACSF) [www.education.gov.au/download-acsf](http://www.education.gov.au/download-acsf)
- Blum, W, Galbraith, PL, Henn, HW & Niss, M 2007, *Modelling and applications in mathematics education*, Springer, New York.
- Galbraith, P 1989, 'From applications to modelling', in D Blane & M Evans (eds), *Mathematical modelling for the senior years*, The Mathematical Association of Victoria, Parkville, pp. 78–86.
- Goos, M 2014, 'Mathematics classroom assessment', *Encyclopedia of Mathematics Education*, Springer, Dordrecht, pp. 413–417.
- Goos, M, Geiger, V & Dole, S 2012, 'Auditing the numeracy demands of the middle years curriculum', *Mathematics Education: Expanding horizons — Proceedings of the 35th annual conference of the Mathematics Education Research Group of Australasia*, Mathematics Education Research Group of Australasia, Singapore, pp. 314–321.
- Grønmo, LS, Lindquist, M, Arora, A & Mullis, IVS 2015, 'TIMSS 2015 Mathematics Framework', *TIMSS 2015 Assessment Frameworks*, International Study Center, Boston, <http://timssandpirls.bc.edu/timss2015/frameworks.html#>.
- Kaiser, G, Blum, W, Ferri, RB & Stillman, G (eds) 2011, *Trends in teaching and learning of mathematical modelling: ICTMA14*, International perspectives on the teaching and learning of mathematical modelling, vol. 1, Springer, Vancouver.
- Kilpatrick, J, Swafford, J, & Bradford, F (eds) 2001, *Adding It Up: Helping children learn mathematics*, National Academies Press, Washington, DC.
- Marzano, RJ & Kendall, JS 2007, *The New Taxonomy of Educational Objectives*, 2nd edn, Corwin Press, USA.
- 2008, *Designing and Assessing Educational Objectives: Applying the new taxonomy*, Corwin Press, USA.
- Mevarech, Z, & Kramarski, B 2014, *Critical Maths for Innovative Societies: The role of metacognitive pedagogies*, OECD Publishing, Paris.
- Norton, S, & O'Connor, BR 2016, *Literature review for senior syllabus revisions: Mathematics*, Queensland Curriculum and Assessment Authority, Brisbane.
- OECD 2003, *PISA 2003 Assessment Framework*, OECD Publishing, Paris.
- 2012, 'Numeracy', in *Literacy, Numeracy and Problem Solving in Technology-Rich Environments — Framework for the OECD Survey of Adult Skills*, OECD, <http://doi.org/10.1787/9789264128859-en>.
- 2015, *PISA 2015 Mathematics Framework*, OECD Publishing, Paris.
- Polya, G 1957, *How to Solve It: A new aspect of mathematical method*, 2nd edn, Princeton University Press, NJ.
- Queensland Curriculum and Assessment Authority *Background to the Literacy and Numeracy Short Course Senior Syllabuses* available on the QCAA website [www.qcaa.qld.edu.au/downloads/senior/snr\\_lit\\_num\\_courses\\_10\\_bgd.pdf](http://www.qcaa.qld.edu.au/downloads/senior/snr_lit_num_courses_10_bgd.pdf).

- Shafer, MC & Foster, S 1997, 'What's up on the web: The changing face of assessment', *Principled Practice in Mathematics and Science Education: Fall 1997*, vol. 1, no. 2, pp. 1–8, <http://ncisla.wceruw.org/publications/index.html#newsletters>.
- Steen, LA 2001, 'The case for quantitative literacy', in *Mathematics and Democracy: The case for quantitative literacy*, National Council on Education and the Disciplines, Princeton, NJ, pp. 1–22.
- Stillman, G, Galbraith, P, Brown, J & Edwards, I 2007, 'A framework for success in implementing mathematical modelling in the secondary classroom', *Mathematics: Essential research, essential practice*, vol. 2, pp. 688–697.
- Stillman, G, Kaiser, G, Blum, W and Brown, JP (eds) 2013, *Teaching Mathematical Modelling: Connecting to research and practice*, Springer, Vancouver.
- Sullivan, P 2011, *Teaching Mathematics: Using research-informed strategies*, ACER Press, Camberwell, Vic.
- Webb, DC 2009, 'Designing professional development for assessment', *Educational Designer*, vol. 1, no. 2, pp. 1–26, [www.educationaldesigner.org/ed/volume1/issue2/article6/](http://www.educationaldesigner.org/ed/volume1/issue2/article6/).
- White, P, Sullivan, P, Warren, E & Quinlan, C 2000, 'To investigate or not to investigate? The use of content-specific open-ended tasks', *The Australian Mathematics Teacher*, vol. 56, no. 2, pp. 6–9, <http://aamt.edu.au/Journals/Journals-Index/The-Australian-Mathematics-Teacher/AMT-56-2-6>.

## 6 Version history

Version	Date of change	Update
1.1	August 2018	Minor amendments to pedagogical and conceptual frameworks
		Internal assessment 1A — minor amendments to conditions



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