**Foundation pathways certificate: Numeracy**

Draft curriculum
for consultation

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Important information

Accreditation period

1 January 20XX – 31 December 20XX.

Implementation of this study commences in 20XX.

Other sources of information

The [VCAA Bulletin](https://www.vcaa.vic.edu.au/news-and-events/bulletins-and-updates/bulletin/Pages/index.aspx) is the only official source of changes to regulations and accredited studies. The *Bulletin* regularly includes advice on VCE studies. It will also include advice on studies within the Vocational specialisation stream and the Foundation pathways certificate. It is the responsibility of each teacher to refer to each issue of the *Bulletin*. The *Bulletin* is available as an e-newsletter via free subscription on the VCAA’s website at: [www.vcaa.vic.edu.au](https://www.vcaa.vic.edu.au/Pages/HomePage.aspx).

To assist teachers in developing courses, the VCAA will publish online *Advice for teachers*. The *Advice for teachers* will provide curriculum development and assessment advice for Modules 1 to 4, including examples of teaching and learning activities and resources for each unit.

The *Advice for Teachers* will also provide advice on opportunities to integrate units across the Vocational specialisation and Foundation pathways certificate.

The [*VCE and VCAL Administrative Handbook*](https://www.vcaa.vic.edu.au/administration/vce-vcal-handbook/Pages/index.aspx) will contain essential information on assessment processes and other procedures.

Providers

Throughout this curriculum the term ‘school’ is intended to include both schools and non-school providers.

Copyright

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Introduction

Scope of study

The purpose of this study is to enable students to develop their everyday numeracy practices to make sense of their personal, public, and future vocational lives. Students develop foundational mathematical skills with consideration of their personal, home, vocational and community environments and contexts, and an awareness and use of accessible and appropriate technologies.

This study focuses on providing students with the fundamental mathematical knowledge, skills, understandings and dispositions to solve problems in real contexts for a range of workplace, personal, further learning and community settings relevant to contemporary society. The numeracies will be situated in accessible, concrete and highly familiar contexts where the mathematics content is explicit with little or no text or distracting information.

The structure of this study aligns with other VCE Mathematics studies, ensuring a familiar format.

The contexts are the starting point and the focus. They are framed in terms of personal, financial, civic, health, recreational and vocational classifications. The numeracies are introduced using a problem-solving cycle with four components:

* formulating
* acting on and using mathematics
* evaluating and reflecting
* communicating and reporting.

The mathematics includes foundational skills related to measurement, shape, numbers, and graphs applied to tasks that are part of the students’ everyday lives. At the end of the two units, students should be able to attempt structured and supported activities and tasks that require simple processes such as counting, sorting, comparing and performing basic arithmetic operations with whole numbers and common, simple fractions and decimals, money, or recognising common spatial representations and measurements in highly familiar contexts.

Rationale

Numeracy is about using mathematics to make sense of the world and applying mathematics in a context for a social purpose. Numeracy gives meaning to mathematics and mathematics is the tool (the knowledge and skills) to be used efficiently and critically. Numeracy involves the use and application of a range of mathematical skills and knowledge which arise in a range of different contexts and situations.

Numeracy enables students to develop logical thinking and reasoning strategies in their everyday activities. It develops students’ problem-solving skills, allows them to make sense of numbers, time, patterns and shapes for everyday activities like cooking, gardening, sport and travel. Through numeracy, students understand the mathematical requirements for personal organisation matters involving money, time and travel. They can then apply these skills to their everyday lives to recognise monetary value, understand scheduling and timetabling, direction, planning, monetary risk and reward.

Technology is an integral part of everyday and working life in Australia. Handheld devices (e.g. tablet) are commonly used for multiple purposes: connectivity, communication, information, and as a tool for carrying out a myriad of functions. Software applications are available on a range of devices. There is an expectation that our students are ready with these skills when they transition to independent living, further study or to work. Therefore, the integration of digital technologies in the learning of mathematical processes is essential and is embedded throughout this study.

Underpinned by applied learning

This numeracy curriculum is framed around an applied learning approach to teaching mathematics. Applied learning incorporates the teaching of skills and knowledge in the context of ‘real life’ experiences. Learners apply what they have learnt by doing, experiencing and relating acquired skills to the real-world. Applied learning emphasises the relevance of what is learnt in the classroom to the ‘real-world’ outside the classroom, and makes that connection as immediate and transparent as possible.

Applied learning contextualises curriculum in a way which empowers and motivates students, while assisting them to develop key skills and knowledge required for employment, further education and active participation in their communities. It advocates nurturing and working with students in a holistic manner, taking into account their personal strengths, interests, goals and previous experiences.

Applied learning takes into account differences in ways of learning and forms of assessment. This focus on an authentic application will often require a shift in focus from discrete curriculum to a more integrated and contextualised approach to learning. Students will focus on learning and applying their skills and knowledge to solve a problem, implement a project or participate in the workforce.

Applied learning may also involve students and their teachers working in partnership with organisations and individuals to access VET and work integrated learning placements. These partnerships can provide the necessary contexts for students to apply the skills and knowledge they have acquired.

This curriculum acknowledges that part of the transition from school to further education and employment is the ability to participate and function in society as an adult. Moving students out of the classroom to learn also allows them to make the shift to become more independent and responsible for their own learning. Best practice applied learning programs are flexible and student-centred, where learning goals and outcomes are designed and negotiated with students.

Aims

This study enables students to:

* develop their everyday numeracy practices to make sense of their personal, public and future vocational lives
* develop foundational mathematical skills with consideration of their personal, home, vocational and community environments and contexts, and an awareness and use of accessible and appropriate technologies.

Structure

This study is made up of two units with a further two units for Units 3 and 4 to be developed. Each unit contains two modules. Each module is based on different numeracies that form the context for the overarching learning intentions. The learning goal of each module describes the intended learning outcome. The approach to achieving the learning outcome is centred on applied learning principles and is detailed through the application of key knowledge and skills.

Each numeracy includes two focus areas that describe the spread of mathematical content knowledge that is required to engage with that specific numeracy. Each focus area includes a learning goal and associated applications.

Each module must include a four-stage problem-solving cycle (page 8) that underpins the capabilities required to solve a mathematical problem embedded in the real-world. In each module, technology must be used (analogue and/or digital tools) as part of the development of a student’s mathematical toolkit (page 10).

The structure of Foundation pathways Numeracy is further explained by the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module** | **Numeracy** | **Focus Area** | **Problem-Solving Cycle** | **Mathematical Toolkit** |
| UNIT 1 |
| Module 1 | Personal numeracy | * Location
* Systematics
 | ✓ | ✓ |
| Module 2 | Financial numeracy | * Number
* Change
 | ✓ | ✓ |
| UNIT 2 |
| Module 3 | Health and recreational numeracy | * Shape
* Quantity and measures
 | ✓ | ✓ |
| Module 4 | Civic numeracy | * Data
* Likelihood
 | ✓ | ✓ |

Problem-solving cycle

Students will develop the explicit skills and capabilities to be able to solve problems and use their foundational numeracy and mathematical skills to investigate problems where the mathematics is embedded within a real-world context. The purpose of this learning outcome is to make explicit how students can identify and recognise where and how mathematics can be embedded in everyday activities and tasks, and then how to engage with the world of mathematics and use that knowledge to solve problems.

Students should be taken through a structured problem-solving cycle, in order to know how to move from the context set in the real-world to the mathematical world and use their mathematical knowledge to solve the mathematical problem at hand. Part of solving any such embedded problem is to be able to review and evaluate the outcomes, then communicate and report on the process and results.

The problem-solving cycle underpinning the curriculum has four distinct components:

* formulate
* act on and use mathematics
* evaluate and reflect
* communicate and report.

The four distinct components are represented in the figure below.



Structure of the problem-solving cycle

The elements and their performance criteria are organised under the four distinct components to match the problem-solving cycle:

1. **Formulate**: select and interpret mathematical information embedded in a real-world context and decide what mathematics to use
2. **Act on and use mathematics**: perform mathematical actions and processes in order to complete task - this includes the use and application of a range of technologies
3. **Evaluate and reflect**: check and reflect on the mathematical problem-solving processes and outcomes in relation to the real world context
4. **Communicate and report**: use a combination of informal and formal mathematical representations to document and report outcomes and results.

a) Formulate

When mathematical problems are embedded within real-world contexts, students need to identify the essential features to be accommodated when transforming the real-world situation into a mathematical problem. This formulation requires students to identify and name the mathematics embedded in the context or scenario and make decisions about how the task can be best represented and solved mathematically. This requires the development of a simple, easy to follow plan, an overview of the context or scenario and related background, and the development of related mathematical questions or investigations of interest.

b) Act on and use mathematics

This stage of the problem-solving cycle involves undertaking the mathematical aspects of the task identified in the first stage. It requires the utilisation of mathematical processes and problem-solving techniques, facts and procedures in order to solve the problem, and will require the selection and use of appropriate tools, including technology. For example, students may need to perform simple arithmetic computations perhaps with use of devices; read and interpret information from tables and simple everyday graphs; or understand and describe 2D shapes and common objects.

c) Evaluate and reflect

Responses to real-world numeracy tasks, including any mathematical results or outcomes, require reviewing. Results should be checked against the original situation in terms of its reasonableness and relevance, and comparisons made with any rough initial estimates. Decisions are made about whether the solution is likely to be ‘about right’ or not, or to revise and adjust the results.

d) Communicate and report

The results and outcomes of any numeracy task require a summary or presentation of the work to be developed, including the findings from the mathematical activities and related applications. This stage requires students to represent and communicate the mathematical results. This will involve the use of both oral and written language, and the use of informal, and some formal, mathematical representations.

Mathematical toolkit

Students will develop their own mathematical toolkit to use where necessary as they undertake their numeracy practices, activities and tasks. On completion of the learning outcomes students should be able to use a variety of tools and appropriate technologies to solve mathematical problems set in practical contexts. Students should become familiar with analogue and digital tools and be confident in knowing the purpose of everyday tools.

These technologies may include:

* analogue and/or digital tools which may include clocks, tape measures, measuring cups, etc.
* digital tools which may include manipulatives, mobile technology, software and applications
* the conventions and use of such analogue and digital tools appropriate to the home or community
* awareness of contemporary technological and online and digital media, including software and applications based on computers, tablets, calculators and hand-held devices and the functionality of their use and application.

Students should demonstrate competence in the following key skills:

* use highly familiar tools and devices to carry out tasks
* read and interpret the inputs and outputs of highly familiar technology
* use highly familiar technology to compute simple problems mathematically and to interpret the results
* reflect on the technology used and the outcomes obtained relative to personal, contextual, and real-world implications.

Entry

There are no prerequisites for entry into any of the units in this course.

Duration

Each unit involves at least 50 hours of scheduled classroom instruction across one year.

Changes to the curriculum

During its period of accreditation minor changes to the study will be announced in the [*VCAA Bulletin*](https://www.vcaa.vic.edu.au/news-and-events/bulletins-and-updates/bulletin/Pages/index.aspx). The *Bulletin* is the only source of changes to regulations and accredited studies. It is the responsibility of each teacher to monitor changes or advice about studies published in the *Bulletin*.

Monitoring for quality

The VCAA will conduct monitoring and quality assurance processes on an annual basis.

Safety and wellbeing

It is the responsibility of the school to ensure that duty of care is exercised in relation to the health and safety of all students undertaking the study.

Employability skills

This study offers a number of opportunities for students to develop employability skills. The *Advice for Teachers* companion document will provide specific examples of how students can develop employability skills during learning activities and assessment tasks.

Legislative compliance

When collecting and using information, the provisions of privacy and copyright legislation, such as the Victorian *Privacy and Data Protection Act 2014* and *Health Records Act 2001*, and the federal *Privacy Act 1988* and *Copyright Act 1968*, must be met.

Assessment and reporting

Satisfactory completion

The award of satisfactory completion for a unit is based on the teacher’s decision that the student has demonstrated achievement of the set of learning goals specified for the module. Demonstration of achievement of a learning outcome and satisfactory completion of a unit are determined by evidence gained through the assessment of a range of learning activities and tasks.

Teachers must develop courses that provide appropriate opportunities for students to demonstrate satisfactory achievement of learning goals.

The decision about satisfactory completion of a unit is distinct from the assessment of levels of achievement. Schools will report a student’s result for each unit to the VCAA as S (Satisfactory) or N (Not Satisfactory).

Learning growth

The VCAA is exploring options to support the use of a learning growth model of assessment and reporting within the Foundation pathways certificate. More information will be available in due course.

Assessment

The teaching, learning and assessment strategies should be based around the applied learning principles.

The cohort of students enrolled in the Foundation pathways program have, in most cases, attended schools for at least ten years, and as such have already encountered much of the mathematics content that is covered in these two units. However, they often have not successfully engaged with the mathematics content or curriculum and are still struggling with learning the foundations of mathematics and numeracy. This challenge needs to be acknowledged and addressed, and in many cases some content taught again as if it is a new experience. It is therefore recommended that taking an applied learning approach is critical. That is, start from where the learner is, and use relevant contexts and materials. Foundation pathways learners will know some disparate elements of mathematics, may lack confidence, and commonly will not see or use mathematics in their daily lives, except where it is personally pertinent and relevant. The teacher needs to tap into those known skills and knowledge and make connections. The connections need to be made between the mathematics world and their real world as well as making connections between different areas of mathematics.

The learning goal and application listed alongside the applied learning principles should be used for course design and for the development of learning activities and assessment tasks. Assessment must be a part of the regular teaching and learning program and should be completed mainly in class or work environment and within a predetermined timeframe.

Assessment is to be undertaken as an ongoing process which integrates knowledge and skills with practical applications over a period of time. It will require a combination of evidence collected through teacher observations along with the collection of records of students’ work.

Suitable tasks for assessing these modules may be selected from the following:

* Investigations and projects; for example a diary on a “week in the life of me”, outlining budgets (pay rates and tax), travel (how do I get places), shopping (best deals)
* Multimedia Presentation or Oral Report; for example an outline of food requirements for an athlete preparing for their sport including nutrition, recipes, calories required and exerted, energy requirements, and measurements including distances
* Interview or Role Play; for example students may prepare job interview questions and responses to include details on scheduling a diary and planning, what resources are needed using data and tables, and understanding cost calculations.

Consideration should be given to the following when assessing student work:

* using practical and ‘hands-on’ materials and resources – including out-of-class as well as classroom-based demonstrations, activities, investigations, and problem-solving
* using authentic materials – not manufactured materials and word problems
* valuing students’ own approaches to solving problems including effective use of supporting technologies
* teaching concepts in contexts relevant to the students, utilising their backgrounds, interests and experiences – this should include putting mathematics into its historical and cultural contexts
* ensuring holistic teaching through integrating other skill areas into numeracy such as oral communication skills and reading and writing skills
* raising awareness about social and community issues and practices that influence and impact on students’ lives
* ensuring that all students experience success to develop their confidence
* using appropriate everyday and mathematical language as part of the teaching of numeracy and mathematics to explain ideas, concepts, and terminology that can be understood by students and applied by them in talking, reading, writing and listening
* encouraging and supporting students to learn through interaction and cooperation – via discussion, asking questions, giving explanations and presentations, and working cooperatively in pairs or small groups.

Authentication

Work related to the outcomes of each unit will be accepted only if the teacher can attest that, to the best of their knowledge, all unacknowledged work is the student’s own. Teachers will need to refer to the [*VCE and VCAL Administrative Handbook*](https://www.vcaa.vic.edu.au/administration/vce-vcal-handbook/Pages/index.aspx) for authentication procedures.

Supporting students with additional needs

In the Foundation pathways certificate, students can be supported and guided in their work and in their assessments. Explicit high levels of teacher support, scaffolding and guidance should be made available. The level of support can include, but is not limited to:

* the provision of highly structured guides, templates, rubrics and exemplars
* encouraging and supporting students to learn through interaction and cooperation – via discussion, asking questions, giving explanations and presentations, and working cooperatively in pairs or small groups
* prompting or questioning to help guide the student when they are checking the reasonableness, appropriateness or feasibility of their work/plan/communication/response
* working alongside the student when learning or undertaking a task – explaining and prompting as they work
* prompting, assisting and collaborating with students when contacting and communicating with internal and external individuals, groups or organisations
* encouraging students to document and report on their work and investigations in a way they feel most comfortable with – orally, in writing, using an audio or video recording, an image or graphic
* providing a variety of flexible and alternative methods and mechanisms to demonstrate learning, for example students who are hearing impaired may sign their response, and those with a physical disability may use a voice synthesiser or communication board
* providing additional time for students to demonstrate learning in addition to the nominal hours suggested if required
* using a variety of flexible, alternative and additional visual, audio, oral and written prompts for explanation, including the use of symbols and gestures.

Units 1 and 2

The purpose of Units 1 and 2 is to focus the teaching and learning on supporting and enabling students to develop their numeracy skills and practices in order to make sense of their daily personal, public, and future vocational lives, and in their local community.

Each module describes the range of contexts that are the starting points, and the focus, for developing the students’ numeracy and underpinning mathematical skills. This range covers four numeracies where foundational mathematical skills are situated and embedded:

* Personal numeracy
* Financial numeracy
* Health and recreational numeracy
* Civic numeracy.

At this level, the contexts should be highly familiar and relevant to the students and should reflect their personal interests and lives. The numeracy problems to be solved should be authentic, concrete and immediate. Simple, everyday mathematical information will be situated in highly familiar, simple and concise oral and/or written materials where the mathematics is highly explicit.

Teaching the numeracies

The four numeracies can all be customised and adapted to meet the needs and interests of a particular cohort of students and therefore be focused on the personal interests of the learners. Many Foundation pathways students will need targeted, personalised, and sometimes individualised learning in order to engage them in successful learning experiences and outcomes:

* **Personal numeracy** explicitly targets the personal, daily lives of the students and can be linked to the other three numeracies.
* **Financial numeracy** relates to the individual students as they go about their daily lives.
* **Health and recreational numeracy** can be used to address a range of different issues of direct concern or that are relevant to the group of students, which may cover their interests in sports or art and crafts, or use health as a way of addressing personal concerns related to wellbeing.
* **Civic numeracy** can be used to address the particular personal and community interests the students might have in relation to their involvement and participation in their local communities and its activities, or in broader social issues such as the environment.

It is possible to customise or adapt the teaching and learning to have a vocational focus. The numeracies can focus on students’ interests in relation to their future work prospects, with the program content focusing on work-life balance and coping with the demands of work and/or vocational training. If teaching the numeracies within a vocational or work-related context, the focus may be on different workplace tools, applications and processes/systems; following and giving directions; participating in quality assurance processes and data collection; reading workplace documents and related information and learning about the financial aspects of that vocation and industry.

Focus areas

Each numeracy comprises two focus areas that describe the spread of mathematical content knowledge that is required to engage with that specific numeracy. There are eight focus areas in total. The associated focus areas are detailed and have been assigned under each of the numeracies. There is a learning goal and an application for each focus area.

The focus areas comprise:

* Number
* Data
* Location
* Shape
* Quantity and measures
* Change
* Likelihood
* Systematics.

Unit 1

Module 1: Personal numeracy

Personal numeracyrelates to the mathematical requirements for personal organisational matters involving money, time and travel, or for participation in community-based activities and events.

Personal numeracy relates to understanding, using and interpreting numerical and mathematical information presented and embedded in different formats, in order to undertake personally relevant activities in highly familiar situations.

The understanding, use and interpretation of personal numeracy can be drawn from, but are not limited to, these examples:

* transport and travel: planning routes, travel times and destinations including use of highly familiar maps, apps and software
* planning or scheduling a day out or attending a social/community event or activity
* personal and home/family day-to-day tasks such as cooking, gardening, sport, travel.

This module must be taught in conjunction with the aims of the rationale, which include the integration of the problem-solving cycle and embedded use of analogue and digital technologies.

Focus: Location

The focus of location includes understanding of space, direction and location in relation to highly familiar local places. Students should be able to follow simple and familiar directions to locations based on digital or printed maps. Students should demonstrate an awareness of their place in space.

Learning goal

On completion of this module the student should be able to:

* find location and direction in relation to everyday, familiar places within the vicinity
* find location and direction with everyday, simple and familiar maps and technologies
* use everyday oral directions using informal language such as left/right, up/down, front/back, under/beside/over.

Application

In a relevant context the application of the learning goal requires students to:

* describe the location of familiar, local places
* use interactive and paper maps to locate highly familiar places or objects
* give and follow simple oral directions to highly familiar locations.

Focus: Systematics

The focus of systematics includes using everyday technology to input and output information for the purposes of planning and scheduling. Students should be able to choose a number of inputs of familiar data and read the outputs and any summary information derived from the technology.

Learning goal

On completion of this module the student should be able to:

* find common and familiar information and data inputs
* read data outputs
* summarise information.

Application

This focus includes the use of technology such as map apps and travel applications. In a relevant context the application of the learning goal requires students to:

* input simple data into familiar apps
* read simple output data
* interpret simple output data.

Module 2: Financial numeracy

Financial numeracy relates to understanding and undertaking basic and personal financial transactions and making straightforward decisions regarding the use and management of money.

Financial numeracy involves managing relevant personal, social or work-related everyday financial costs, charges, income and expenditure.

The understanding, use and interpretation of financial numeracy can be drawn from, but are not limited to, these examples:

* income: pay, pay rates, payslips, deductions, loadings
* shopping and living costs: payments, costs, checking change, savings on sale items, utility bills, comparing common familiar food costs $/kg, and comparing pricing per unit costs on price tags to ascertain value for money
* personal banking: opening and managing an account, keeping money safe online, and common methods of payments
* savings: personal saving plans and amounts, and how to reduce costs.

This module must be taught in conjunction with the aims of the rationale, which include the integration of the problem-solving cycle and embedded use of analogue and digital technologies.

Focus: Number

The focus of number aims to develop students’ number sense through meaningful application of numeracy practices to a range of contexts where whole numbers and some simple fractions and decimals are used.

Learning goal

On completion of this module the student should be able to understand:

* place value and numbers up to 1000
* whole numbers and monetary amounts up to $1000
* addition and subtraction (with no borrowing or decomposition) of whole numbers and familiar monetary amounts into the 100s
* common, simple unit fractions such as 1/2, 1/4 and 1/10
* common decimals and percentages such as 0.5, 0.25, 50%, 25%.

Application

In a relevant context the application of the learning goal requires students to:

* identify place value and read whole numbers up to 1000
* perform calculations of addition and subtraction with simple whole number amounts and familiar monetary amounts (into the 100s)
* recognise and understand very common simple unit fractions, decimals and percentages.

Focus: Change

The focus of change includes the recognition of simple patterns and change in spatial, arithmetical and numerical contexts and applications. Students should recognise when change is occurring.

Learning goal

On completion of this module the student should be able to understand:

* pattern prediction with shapes
* repeating patterns with one element such as with shapes, or $2, $4, $6, $8, …
* changes and number matching with simple numbers. For example, prices increasing or decreasing, and matching corresponding numbers.

Application

In a relevant context the application of the learning goal requires students to:

* recognise changes in numerical values such as prices increasing or decreasing with a common fixed price discount
* number matching and comparison of simple numbers in context such as matching prices from receipts to on the shelf items
* predict pattern continuation with shapes. For example, triangle, square repeating patterns
* demonstrate repeating patterns with one element. For example, $2, $4, $6, $8, …

Unit 2

Module 3: Health and recreational numeracy

Health and recreational numeracy relates to accessing, understanding and using foundational mathematical information to be aware of issues related to health and well-being, or when engaging in different recreational activities. Recreational activities may include indoor and outdoor pursuits, arts, sports and other personal interests and hobbies.

The understanding, use and interpretation of health and recreational numeracy can be drawn from, but are not limited to, these examples:

* personal health and wellbeing: food and drink ingredients and intakes
* cooking and eating: planning and making meals, following simple recipes
* sport and games: score keeping, timing, shapes/dimensions of playing spaces
* crafts and hobbies: concepts of shape and dimension in design and creation of goods/items.

This module must be taught in conjunction with the aims of the rationale, which include the integration of the problem-solving cycle and embedded use of analogue and digital technologies.

Focus: Shape

The focus of shape includes the recognition, naming and comparison of familiar shapes and objects in relation to size and shape of common one- and two-dimensional shapes. Students should be able to describe and classify common and familiar shapes in both diagrammatical and concrete forms. This focus also includes common characteristics and properties used in classifying shapes.

Learning goal

On completion of this module the student should be able to understand:

* common and familiar one- and two-dimensional shapes such as lines, triangles, circles, squares, etc.
* common properties of different one- and two-dimensional shapes such as size, colour, number and type of sides (straight/curved).

Application

In a relevant context the application of the learning goal requires students to:

* recognise common and familiar one- and two-dimensional shapes
* name common and familiar one- and two-dimensional shapes
* construct common and familiar two-dimensional shapes
* categorise similar shapes according to common classifications.

Focus: Quantity and measures

The focus of quality and measures enables students to explore highly familiar everyday measurements and quantities. Students will develop a beginning sense of estimation, and will know and use simple and straightforward quantities and measurements such as those found in the home.

Learning goal

On completion of this module the student should be able to:

* use common and familiar basic metric measurements and quantities such as length, mass, capacity/volume, time and temperature such as personal height and weight, door height, liquid measurement, temperatures
* recognise common and familiar units such as m, cm, Kg, L, degrees C
* recognise 12-hour digital time, including minutes and hours on digital clocks, and hours, quarter-, and half-hours on analogue clocks
* recognise day and month dates.

Application

In a relevant context the application of the learning goal requires students to:

* estimate lengths of highly familiar objects or items
* order and compare simple everyday measures and quantities
* recognise familiar and commonly used units of metric measurement
* read common and familiar dates and times using digital and analogue clocks.

Module 4: Civic numeracy

Civic numeracyrefers to activities related to participating in the student’s community and social life through being aware of and knowing about government and societal data, information and related processes.

The understanding, use and interpretation of civic numeracy can be drawn from, but are not limited to, these examples:

* data and information in the popular media: sports results, weather, music, and film
* infographics: reading and understanding basic data and information presented in infographics from government, authorities, independent agencies and community organisations
* simple, everyday risk and likelihood of events: understanding basic risk and generalised likelihood and chance of events relating to society such as weather, health, opinion polls.

This module must be taught in conjunction with the aims of the rationale, which include the integration of the problem-solving cycle and embedded use of analogue and digital technologies.

Focus: Data

Data can be found in everyday life, workplaces, and society. Students should be able to collect, represent and read familiar data represented in simple graphs and tables found in the media or in everyday contexts.

Learning goal

On completion of this module the student should be able to understand:

* simple data collection by hand or with tables
* simple cases of data, graphs and infographics.

Application

In a relevant context the application of the learning goal requires students to:

* collect and display simple data
* read simple graphs such as bar or pie graphs
* read simple tables
* identify and locate key facts from simple data.

Focus: Likelihood

The focus of likelihood includes being able to understand and use everyday language of likelihood and chance related to common and familiar events. Students should be able to talk about chance and risk given the likelihood of common and familiar events occurring.

Learning goal

On completion of this module the student should be able to:

* use everyday language to talk about the likelihood of an event occurring such as possible, impossible, unlikely, likely, certain, “Buckley’s chance”, “pigs might fly”, “dead-set”
* understand language and relative magnitude of simple and highly familiar chance events.

Application

In a relevant context the application of the learning goal requires students to:

* recognise and use the everyday language of chance and likelihood
* use everyday language to compare and order different and simple magnitudes of chance.

Evidence for satisfactory completion

The elements and performance criteria below detail the requirements for satisfying the learning goal. The learning goal is achieved when students can demonstrate achievement of the elements and their performance criteria. However, it is not expected that one assessment task or activity can or should cover all the performance criteria. All the performance criteria should be covered at least once across the different numeracy tasks for each unit.

The elements are grouped according to the four distinct components of the problem-solving cycle.

|  |  |
| --- | --- |
| Element | Performance criteria |
| *Elements describe the essential outcomes.* | *Performance criteria describe the performance needed to demonstrate achievement of the element.* |
| 1. Formulate: identify, select and interpret mathematical information embedded in a numeracy context and select mathematical knowledge and skills to use to solve the problem
 | 1.1 Decide on the purpose of the task and the question(s) to be posed and answered1.2 Identify and interpret the relevant mathematical information embedded in the selected numeracy context and materials 1.3 Describe and define the mathematical operation(s), processes and tools needed to solve the problem1.4 Make a simple, short plan of the activities to be undertaken to perform the mathematical action(s). |
| 1. Act on and use mathematics: perform relevant mathematical actions and processes in order to complete numeracy task
 | 2.1 Select and implement a simple mathematical problem-solving process for completing the numeracy task 2.2 Undertake rough estimations required prior to completing the numeracy task2.3 Select and use appropriate technology, tools and applications to complete the numeracy task2.4 Undertake relevant mathematical actions, processes and calculations to complete the numeracy task. |
| 1. Evaluate and reflect: check and reflect on mathematical results
 | 3.1 Check any estimations, actions and any calculation results to see if results are as expected3.2 Review appropriateness and reasonableness of results to the numeracy task and adjust if necessary, including to redo any calculations if required. |
| 1. Communicate and report: use informal and formal mathematical representation to document and report outcomes and results
 | 4.1 Use informal and some formal written mathematical representations to document and report on the mathematical processes used and the results of the numeracy task4.2 Use informal and some formal oral mathematical language to present and discuss the mathematical processes used and the results of the numeracy task4.3 Use one or two different formats, devices or technologies to represent and document the numeracy task. |

Range of performance statements for learning outcome 2: Units 1 and 2

For each of the elements identified, the performance statements below specify the range of actions, the complexity of the numeracy tasks and the levels of performance that are expected of students in Units 1 and 2. It also indicates the levels of support that teachers can provide.

|  |  |
| --- | --- |
| Element | Range of performance statements to be met in Units 1 and 2 |
| 1. Formulate: identify, select and interpret mathematical information embedded in a numeracy context and select mathematical knowledge and skills to use to solve the problem
 | * Locates and recognises simple, everyday mathematical information in highly familiar short and simple oral and/or written materials where the mathematics is highly explicit with concise and simple text and little distracting information.
* Relies heavily on hands-on (concrete) and real-life materials, personal experience and prior knowledge to select appropriate actions and processes selected from one or two related mathematical processes described in the areas of study. Teacher scaffolding, advice, and prompting is available.
* Develops a plan that is short and clear, using a combination of both informal and some formal written mathematical language and symbols, with support and guidance available; for example, through the use of a planning template.
 |
| 1. Act on and use mathematics: perform relevant mathematical actions and processes in order to complete numeracy task
 | * Involves the use and application of one or two related steps or simple processes such as counting, sorting, performing basic arithmetic operations with whole numbers or money, recognising common spatial or location representations, etc.
* Uses personal, informal 'in-the-head' or pen-and-paper methods to calculate or uses a calculator, apps or technology.
* Identifies and uses appropriate tools at a basic level in a limited range of applications; for example, uses a ruler to decide whether an item is longer than 10 cm or uses a simple calculator to subtract two numbers.
 |
| 1. Evaluate and reflect: check and reflect on mathematical results
 | * Relies heavily on hands-on (concrete) and real-life materials, personal experience and prior knowledge to roughly check the reasonableness of the outcome(s) with support via prompting or questioning.
 |
| 1. Communicate and report: use informal and formal mathematical representation to document and report outcomes and results
 | * Writes simple and everyday informal and minimal formal written representations of numbers, monetary amounts and data (into the 100s), including with the support of technology.
* Uses common, everyday, informal oral language and gestures to convey numeracy-based information and processing; for example, language of position such as *up, down, behind, right, left, over, through; comparative language such as taller, heavier, hotter, smaller; language of shape, size, colour such as straight, curved, square, circle, triangle,* etc.
* Uses simple and informal symbolism, diagrams and conventions relevant to the mathematical knowledge of the level; for example:
	+ 57, $5.98, 1/2
	+ +, −
 |

Learner support

Students can be supported and guided in their work and in their assessments. Explicit high levels of teacher support, scaffolding, and guidance should be made available. The level of support can include, but is not limited to:

* the provision of highly structured guides and templates; for example, by providing a planning template to be completed for the Formulate stage of the problem-solving cycle; or providing a pre-structured table or chart for collecting data or plotting a chart/graph
* prompting or questioning to help guide the student; for example, prompting them when they are roughly checking the reasonableness of the outcome(s) of an activity or calculation or in estimating measurements.
* working alongside the student when learning or undertaking a task – explaining and prompting as they work
* encouraging students to document and report on their work and investigations in a way they feel most comfortable with – orally, in writing, using an audio or video recording, an image/graphic.

Units 3 and 4

Units 3 and 4 are to be developed.