

Essential Mathematics 2019 v1.1

Applied Senior Syllabus

MERIDAN STATE COLLEGE - MAE

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www.qcaa.qld.edu.au/senior/senior-subjects

1 Course overview

1.1 Introduction

1.1.1 Rationale

Mathematics is a unique and powerful intellectual discipline that is used to investigate patterns, order, generality and uncertainty. It is a way of thinking in which problems are explored and solved through observation, reflection and logical reasoning. It uses a concise system of communication, with written, symbolic, spoken and visual components. Mathematics is creative, requires initiative and promotes curiosity in an increasingly complex and data-driven world. It is the foundation of all quantitative disciplines.

To prepare students with the knowledge, skills and confidence to participate effectively in the community and the economy requires the development of skills that reflect the demands of the 21st century. Students undertaking Mathematics will develop their critical and creative thinking, oral and written communication, information & communication technologies (ICT) capability, ability to collaborate, and sense of personal and social responsibility — ultimately becoming lifelong learners who demonstrate initiative when facing a challenge. The use of technology to make connections between mathematical theory, practice and application has a positive effect on the development of conceptual understanding and student disposition towards mathematics.

Mathematics teaching and learning practices range from practising essential mathematical routines to develop procedural fluency, through to investigating scenarios, modelling the real world, solving problems and explaining reasoning. When students achieve procedural fluency, they carry out procedures flexibly, accurately and efficiently. When factual knowledge and concepts come to mind readily, students are able to make more complex use of knowledge to successfully formulate, represent and solve mathematical problems. Problem-solving helps to develop an ability to transfer mathematical skills and ideas between different contexts. This assists students to make connections between related concepts and adapt what they already know to new and unfamiliar situations. With appropriate effort and experience, through discussion, collaboration and reflection of ideas, students should develop confidence and experience success in their use of mathematics.

The major domains of mathematics in Essential Mathematics are Number, Data, Location and time, Measurement and Finance. Teaching and learning builds on the proficiency strands of the P–10 Australian Curriculum. Students develop their conceptual understanding when they undertake tasks that require them to connect mathematical concepts, operations and relations. They will learn to recognise definitions, rules and facts from everyday mathematics and data, and to calculate using appropriate mathematical processes.

Students will benefit from studies in Essential Mathematics because they will develop skills that go beyond the traditional ideas of numeracy. This is achieved through a greater emphasis on estimation, problem-solving and reasoning, which develops students into thinking citizens who interpret and use mathematics to make informed predictions and decisions about personal and financial priorities. Students will see mathematics as applicable to their employability and lifestyles, and develop leadership skills through self-direction and productive engagement in their learning. They will show curiosity and imagination, and appreciate the benefits of technology. Students will gain an appreciation that there is rarely one way of doing things and that real-world mathematics requires adaptability and flexibility.

Assumed knowledge, prior learning or experience

Assumed knowledge refers to the subject matter that teachers can expect students to know prior to beginning this subject. Emphasis is placed on the mastery of subject matter, ensuring key concepts or procedures are learnt fully so they will not need reteaching.

Developing mastery often involves multiple approaches to teaching and conceptualising the same mathematical concept. When students have a good understanding of a key concept or procedure, they are more easily able to make connections to related new subject matter and apply what they already know to new problems.

Subject matter from previous unit/s is assumed for subsequent unit/s.

The following is a non-exhaustive list of assumed knowledge from the P–10 Australian Curriculum that must be learnt or revised and maintained as required:

- recall concepts of number and its operations, percentages, money, rates and ratios
- read and use graphs and scales
- recall concepts of probability, data collection and statistical data representations
- use a scientific calculator and other technology, where appropriate
- substitute numbers into formulas
- translate word problems to mathematical form.

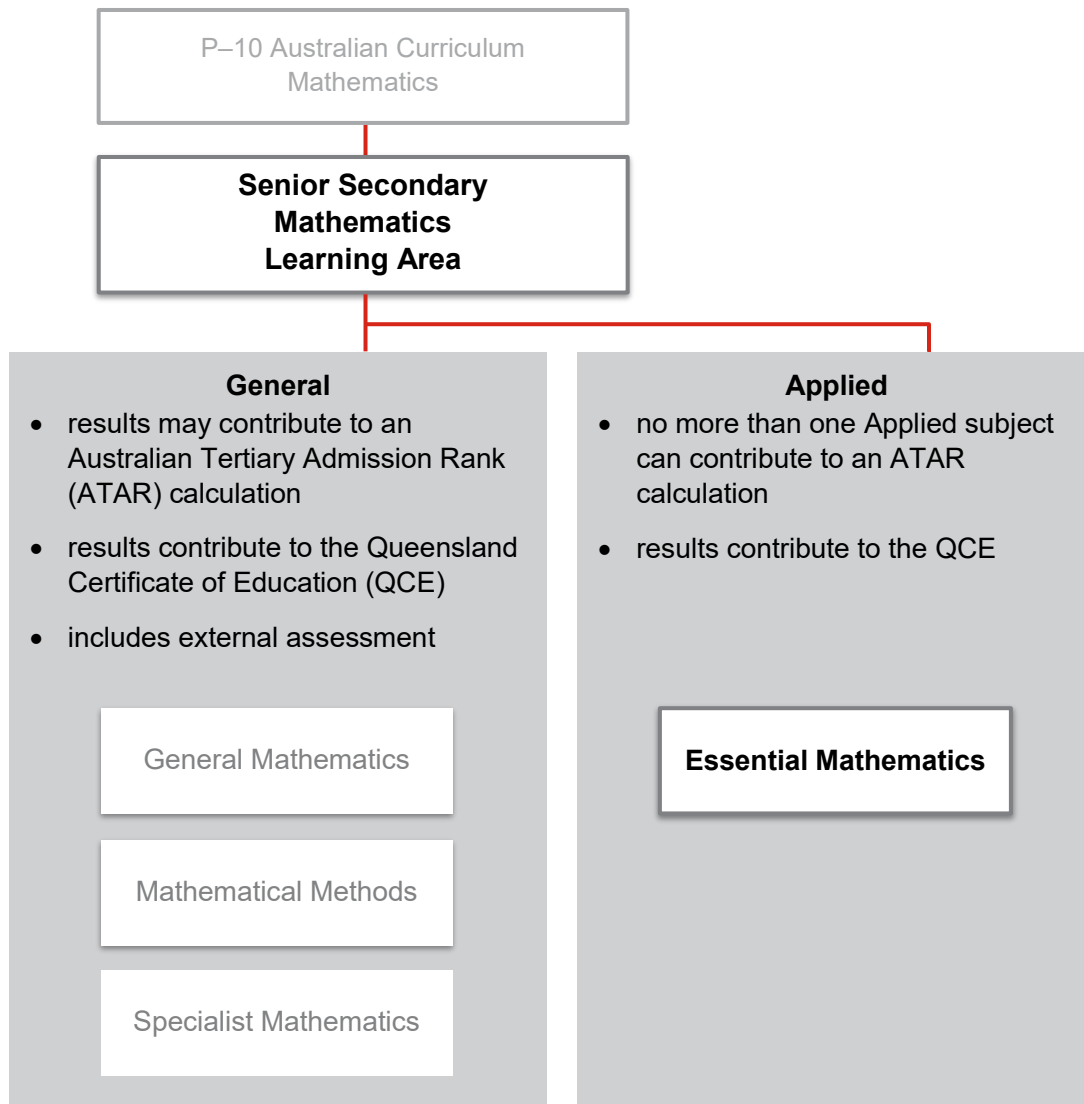
Pathways

Essential Mathematics is an Applied subject suited to students who are interested in pathways beyond Year 12 that lead to tertiary studies, vocational education or work. A course of study in Essential Mathematics can 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.

1.1.2 Learning area structure

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

Figure 1: Learning area structure



1.1.3 Course structure

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

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

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

Students who complete this course of study with a grade of C or better will meet the numeracy requirement for QCE and should also be able to demonstrate numeracy competencies equivalent to the Australian Core Skills Framework (ACSF)¹ Level 3.

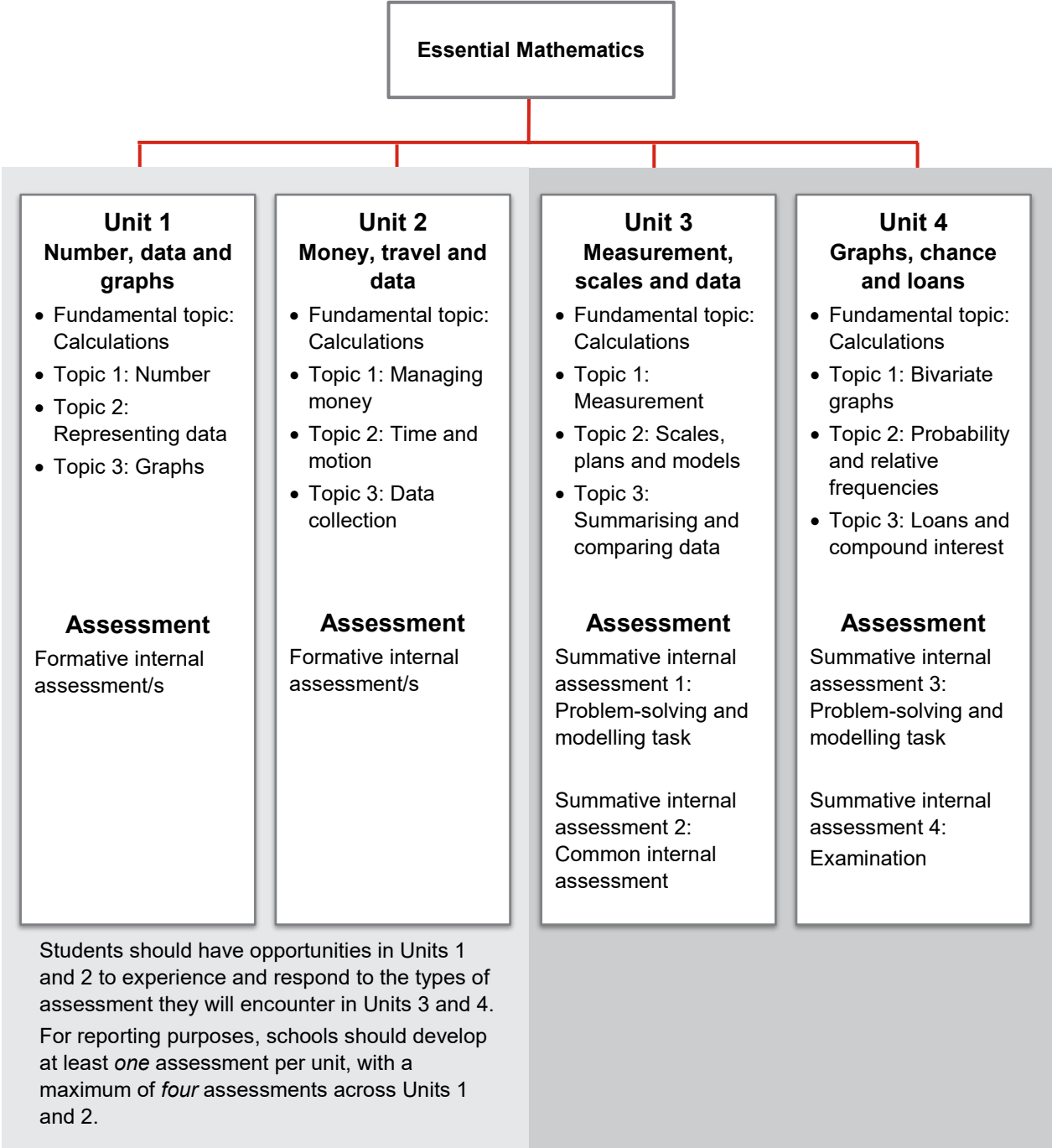
Subject matter that is denoted by '[complex]' is considered to be complex and indicates alignment to ACSF Level 4 or higher. All other subject matter is considered to be simple and indicates alignment to ACSF Level 3.

Students who demonstrate attainment of simple subject matter only will be able to achieve a maximum of a C grade overall. Figure 2 outlines the structure of this course of study.

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

¹ <https://www.education.gov.au/australian-core-skills-framework>

Figure 2: Course structure



Additional Requirements

Study Requirements	Special Requirements
<p>Being an Applied subject a significant commitment of time and energy to complete the course successfully is required. This includes:</p> <ul style="list-style-type: none">• Three lesson per week face to face teaching• Regular study at least 3 times each week for a minimum of 1 hour per session, possibly in study groups• Significant increase in work load when preparing for assessments.	<ul style="list-style-type: none">• A scientific calculator (Casio fx82 AU PLUS II), 30cm ruler