Essential Mathematics

Applied senior subject

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.

Pathways

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 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.

Objectives

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

- recall mathematical knowledge
- use mathematical knowledge
- communicate mathematical knowledge
- evaluate the reasonableness of solutions
- justify procedures and decisions
- solve mathematical problems.

Structure

Unit 1	Unit 2	Unit 3	Unit 4
Number, data and graphs • Fundamental topic: Calculations • Number • Representing data • Managing money	**Data and travel** • Fundamental topic: Calculations • Data collection • Graphs • Time and motion	**Measurement, scales and chance** • Fundamental topic: Calculations • Measurement • Scales, plans and models • Probability and relative frequencies	**Graphs, data and loans** • Fundamental topic: Calculations • Bivariate graphs • Summarising and comparing data • Loans and compound interest

Assessment

Schools devise assessments in Units 1 and 2 to suit their local context.

In Units 3 and 4 students complete *four* summative assessments. Schools develop three summative internal assessments and the common internal assessment (CIA) is developed by the QCAA.

Summative assessments

Unit 3	Unit 4
Summative internal assessment 1 (IA1): • Problem-solving and modelling task	Summative internal assessment 3 (IA3): • Problem-solving and modelling task
Summative internal assessment 2 (IA2): • Common internal assessment (CIA)	Summative internal assessment (IA4): • Examination — short response