

Mathematics

In selecting their Mathematics Units students should first:

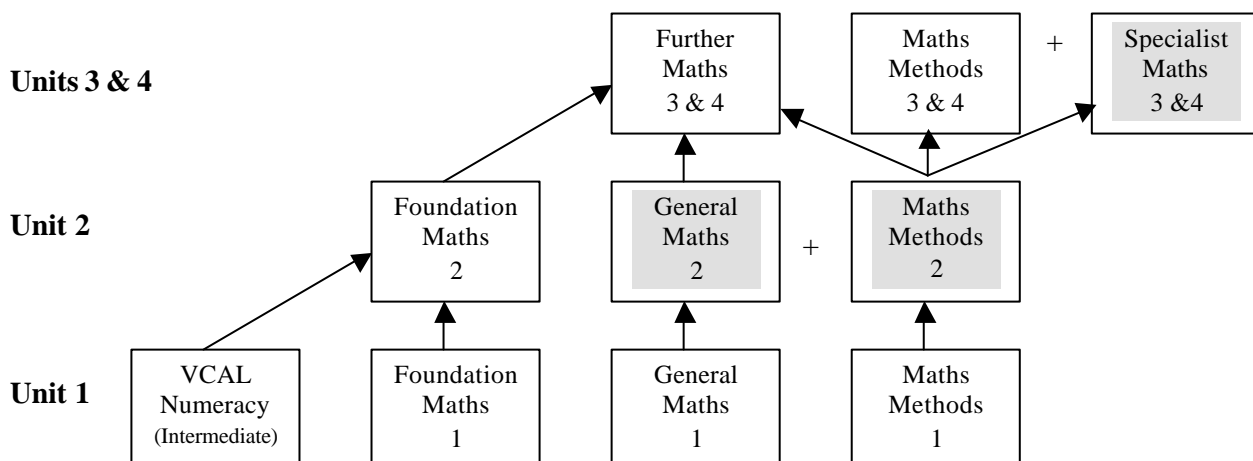
1. Decide how many units of Mathematics they wish to do (usually 2 or 4 Mathematics units per year).
2. Check that the units they select will allow them to do the Units 3 and 4 at Year 12 that they need to proceed to their preferred courses at tertiary colleges and universities.

VCE Mathematics units are arranged in seven blocks: four blocks in Units 1 and 2 and three blocks in Units 3 and 4.

YEAR 11	VCAL Numeracy Skills Intermediate (1)	Foundation Maths (1 and 2)	General Mathematics (1 and 2)	Mathematical Methods (1 and 2)	
YEAR 12			Further Mathematics (3 and 4)	Mathematical Methods (3 and 4)	Specialist Mathematics (3 and 4)

The following table shows your possible options for Units 3 and 4 considering the Units 1 and 2 completed:

UNITS 1 AND 2		UNITS 3 AND 4
<ul style="list-style-type: none"> • General Mathematics 1 and 2 only • Foundation Maths 1 & 2 only • VCAL Numeracy Skills 1 	leads on to leads on to leads on to	<ul style="list-style-type: none"> • Further Mathematics 3 and 4 only • NO MATHS POSSIBLE <i>(except in very special cases)</i> • Foundation Maths 2
<ul style="list-style-type: none"> • Mathematical Methods 1 and 2 only 	leads on to one of	<ul style="list-style-type: none"> • Mathematical Methods 3 and 4 only • Further Mathematics 3 and 4 only
<ul style="list-style-type: none"> • General Mathematics 1 and 2 and Mathematical Methods 1 and 2 	leads on to one of	<ul style="list-style-type: none"> • Mathematical Methods 3 and 4 and Specialist Mathematics 3 and 4 • Mathematical Methods 3 and 4 and Further Mathematics 3 and 4 • Mathematical Methods 3 and 4 only • Further Mathematics 3 and 4 only



VCAL Numeracy Skills Intermediate Unit

Areas of Study

1. Numeracy for **Practical Purposes** – designing, making and measuring
2. Numeracy for **Interpreting Society** – numerical and graphical information in the contexts of personal, community and work lives
3. Numeracy for **Personal Organisation** – money, time and travel
4. Numeracy for **Knowledge** – mathematical skills for further mathematics study or related fields

Learning Outcomes

Students must demonstrate competency in five of the six learning outcomes to be credited with this unit:

1. **Design** – Describe, design or represent real life objects
eg. follow construction plans to assemble a 3-D object
2. **Measuring** – Interpret, make or purchase materials in familiar practical situations
eg. cost the renovation of a kitchen
3. **Money and Time** – Make decisions about money and time in familiar situations
eg. cost the catering for a party and preparing a time schedule for preparation and delivery
4. **Location** – Give and follow oral and written directions
eg. plan a day walk at a national park
5. **Data** – Represent and interpret public information that is of interest or relevance
eg. research the effect of a household conservation campaign on water consumption
6. **Numerical Information** – Interpret public information that is in texts of interest or relevance
eg. compare the various deals offered for interstate holidays

Assessment

Assessment criteria will be grouped according to:

1. Mathematical knowledge and techniques *eg. interpret and discuss the meaning of tables and graphs*
2. Mathematical language *eg. use the words and symbols for measurement units*
3. Interpretation *eg. check results against initial estimates*

Assessment work will include a combination of:

- Oral presentations
- Small group work
- Investigations
- Reports, timelines, posters and flowcharts
- Multimedia and WorldWideWeb page production
- Research projects
- Problem-solving tasks

Foundation Maths 1 & 2

The Foundation Mathematics course does not usually lead to any Units 3 and 4 in VCE Mathematics. It may not fulfil the requirement for “any Maths”

Areas of Study

1. Space and shape
2. Patterns in number
3. Handling data
4. Measurement and design.

Learning Outcomes

On completion of this unit, the student should be able to:

7. Use confidently and competently the mathematical skills and concepts.
8. Apply and discuss mathematical procedures in contexts relating to everyday life, personal work and study.
9. Select and use technology to apply mathematics to a range of practical contexts.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work will mostly be assignments and will include:

1. Tests
2. Projects
3. Problem –solving tasks

Mathematical Methods

Unit 1

Areas of Study

1. Functions and graphs
2. Polynomials
3. Exponential and logarithmic functions
4. Circular functions

Learning Outcomes

On completion of the unit, the student should be able to:

1. Define and explain key concepts as specified in the content from the areas of study and apply a range of related mathematical routines and procedures.
2. Apply mathematical processes in non-routine contexts and to analyse and discuss these applications of mathematics.
3. Select and appropriately use technology to produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work will include:

1. Tests
2. Exam
3. Project or problem solving task.

Unit 2

Areas of Study

1. Relations and functions
2. Rates of change
3. Calculus
4. Probability
5. Combinatorics

Learning Outcomes & Assessment

Same as for Unit 1.

General Mathematics

Unit 1

Areas of Study

1. Statistics
2. Algebra – linear
3. Functions and graphs
4. Variation

Learning Outcomes

On completion of this unit, the student should be able to:

1. Define and explain key concepts, as specified in the content from the areas of study, and apply a range of related mathematical routines and procedures.
2. Apply mathematical processes in non-routine contexts and analyse and discuss these applications of mathematics.
3. Select and appropriately use technology to produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work will include:

1. Exercises
2. Tests
3. Exam
4. Project or problem-solving task

Unit 2

Areas of Study

1. Trigonometry
2. Measurement
3. Coordinate geometry
4. Linear programming

Learning Outcomes & Assessment

Same as for Unit 1.

Mathematical Methods

Unit 3

Areas of Study

1. Coordinate geometry
2. Circular (trigonometric) functions
3. Calculus
4. Algebra

Learning Outcomes

On completion of this unit, the student should be able to:

1. Define and explain key concepts as specified in the content from the areas of study, and to apply a range of related mathematical routines and procedures.
2. Apply mathematical processes in non-routine contexts and to analyse and discuss these applications of mathematics.
3. Select and appropriately use technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work makes up 60% of the internal assessment and contributes 20% to the final assessment. It consists of:

1. Project 40 marks
2. Tests - two 10 marks each

Unit 4

Areas of Study

1. Calculus
2. Statistics and probability

Learning Outcomes

As for Unit 3.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work makes up 40% of the internal assessment and contributes 14% to the final assessment. It consists of:

1. Analysis tasks – two 20 marks each

The external assessment consists of the following tasks under examination conditions, each contributing 33% of the final assessment:

Examination 1 – Facts, skills and application task (multiple choice questions)

Examination 2 – Analysis task (extended-answer questions)

Final Assessment:

Exams	66%
School-assessed coursework	34%

Specialist Mathematics

Not to be undertaken with Further Mathematics.

Unit 3

Areas of Study

1. Coordinate geometry
2. Circular (trigonometric) functions
3. Algebra
4. Calculus
5. Vectors in two and three dimensions
6. Mechanics

Learning Outcomes

On completion of this unit, the student should be able to:

1. Define and explain key concepts as specified in the content from the areas of study, and to apply a range of related mathematical routines and procedures.
2. Apply mathematical processes, with an emphasis on general cases, in non-routine contexts, and to analyse and discuss these applications of mathematics.
3. Select and appropriately use technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work makes up 40% of the internal assessment and contributes 14% to the final assessment. It consists of:

1. Analysis tasks – two 20 marks each

Unit 4

Areas of Study

As for Unit 3.

Learning Outcomes

As for Unit 3.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work makes up 60% of the internal assessment and contributes 20% to the final assessment. It consists of:

1. Problem-solving or modelling application task 40 marks
2. Tests – two 10 marks each

The external assessment consists of the following tasks under examination conditions, each contributing 33% of the final assessment:

Examination 1 – Facts, skills and application task (multiple choice questions)

Examination 2 – Analysis task (extended-answer questions)

Final Assessment:

Exams	66%
School-assessed coursework	34%

Further Mathematics

Unit 3

Areas of Study

1. Data analysis (Core)
2. Networks and decision mathematics (Applications)

Learning Outcomes

On completion of this unit, the student should be able to:

1. Define and explain key terms and concepts as specified in the content from the areas of study, and use this knowledge to apply related mathematical procedures to solve routine application problems.
2. Use mathematical concepts and skills developed in the 'Data analysis' area of study to analyse a practical and extended situation and interpret the outcomes of this analysis in relation to key features of that situation.
3. Select and appropriately use technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches in the areas of study.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work makes up 60% of the internal assessment and contributes 20% to the final assessment. It consists of:

- | | |
|---|----------|
| 1. Application task | 40 marks |
| 2. Analysis task – test or assignment of 2-4 hours duration | 20 Marks |

Unit 4

Areas of Study

1. Geometry and trigonometry (Applications)
2. Graphs and relations (Applications)

Learning Outcomes

On completion of this unit, the student should be able to:

1. As for Unit 3.
2. Apply mathematical processes in contexts related to the 'Applications' area of study and to analyse and discuss these applications of mathematics.
3. As for Unit 3.

Assessment

Satisfactory completion is based on demonstrating that the learning outcomes for each unit have been met through completion of school-assessed coursework. This work makes up 40% of the internal assessment and contributes 14% to the final assessment. It consists of:

- | | |
|---|----------|
| 1. Analysis Task 1 – test or assignment of 2-4 hours duration | 20 Marks |
| 2. Analysis Task 2 – test or assignment of 2-4 hours duration | 20 Marks |

The external assessment consists of the following tasks under examination conditions, each contributing 33% of the final assessment:

Examination 1 – Facts, skills and application task (multiple choice questions)

Examination 2 – Analysis task (extended-answer questions)

Final Assessment:

Exams	66%
School-assessed coursework	34%

