

VCE Mathematics 2023- 2027

Mathematical Investigations

Acknowledgement of Country

The VCAA respectfully acknowledges the Traditional Owners of Country throughout Victoria and pays respect to the ongoing living cultures of First Peoples.



VCE Mathematics On-demand Videos

To support the implementation of the 2023-2027 study design for Mathematics, we have developed a series of short on-demand videos outlining approaches that teachers may wish to utilise in the classroom.

The information presented in these on-demand videos has been developed by current VCE teachers, in conjunction with the VCAA, and offer suggestions for ways schools could approach the implementation of the 2023-2027 VCE Mathematics study design.

General Outline

Briefly outline the revised material discussed in this on demand presentation

1. Nature and purpose
2. Structure
3. Implementation and style
4. Sample task topic Unit 1 and 2
5. VCAA Support material and contact

Topic 1 – Nature and purpose

Used to investigate one or two practical or theoretical contexts or scenarios based on content from areas of study and application of key knowledge and key skills for the outcomes.

Each investigation:

- provides a **natural and effective context** for addressing Outcome 2 and Outcome 3
- can be used to support **computational thinking** and **experimentation**
- is one of the **assessment task types** listed for Units 1 and 2

Three investigation tasks are required as **assessment task types** in Foundation Mathematics Units 3 and 4.

Topic 2 - structure

There are **three components** to mathematical investigation:

- **Formulation:** overview of the context or scenario, and related background, including historical or contemporary background as applicable, and the mathematisation of questions, conjectures, hypotheses, issues or problems of interest.
- **Exploration:** investigation and analysis of the context or scenario with respect to the questions of interest, conjectures or hypotheses, using mathematical concepts, skills and processes, including the use of technology and application of computational thinking.
- **Communication:** summary, presentation and interpretation of the findings from the mathematical investigation and related applications.

Topic 3 – implementation and style

- Can be implemented in a variety of ways to meet requirements:
 - as an investigative **learning activity** or activities
 - as an **assessment task** or tasks
 - a **combination** of the above
- Time range **1 to 2 weeks**:
- **Minimum** one longer activity/task, or two shorter activities/tasks over the equivalent of **1 week** duration
- **Up to 2 weeks**, a suitable combination, for example, two longer activities/tasks, one longer and two shorter activities tasks, three medium activities/tasks, four shorter activities/tasks

Topic 4 - Sample task topic Unit 1 & 2

Investigating regions of Australia to determine the impact of weather on selected communities.

- **Formulation:**
 - Using available websites to explore different Australian regions and select several where weather patterns appear to be significantly different. This could include, for example, rainfall, wind, humidity, etc.
- **Exploration:**
 - includes entering relevant data and information into the spreadsheets and undertaking any calculations or analysis in order to identify, investigate and compare the patterns found in the data being used.
- **Communication:**
 - Findings communicated in a client report.

Topic 4 - Sample task topic Unit 1 & 2

Exploring the impact of transformations on a graphs and graphical images.

- **Formulation:**
 - Research one or two basic function graphs and geometrical images that should be investigated. Consider appropriate transformations that could be applied to the chosen graphs and images. Select a dynamic graphing technology to be used in the investigation.
- **Exploration:**
 - Apply a series of transformations to the chosen functions and images and describe their effect. Explore combinations of transformations and analyse their impact on the chosen shapes. Investigate combinations of transformations that return the transformed image back to its original state. Analyse any findings.
- **Communication:**
 - Findings communicated in a client report.

Topic 5 – example marking rubric

Outcomes	Marks allocated
Outcome 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 to solve practical problems from a range of everyday and real-life contexts.	7 or 8
Outcome 2 Apply mathematical processes in non-routine practical contexts, including situations with some open-ended aspects requiring investigative, modelling or problem-solving techniques or approaches, and analyse and discuss these applications of mathematics.	15
Outcome 3 Apply computational thinking and use numerical, graphical, symbolic and statistical functionalities of technology to develop mathematical ideas, produce results and carry out analysis in practical situations requiring investigative, modelling or problem-solving techniques or approaches.	8 or 7
Total marks	30

Contact

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