

Mathematical Investigations



What to do

1. Choose a topic for your investigation
2. Collect the necessary background information and clearly state a realistic problem to investigate
3. Use mathematical approaches to solve the problem
4. Present a report to tell others what you did and what you found out. Include any references and acknowledge the assistance you receive.

Projects can be on any mathematical topic and may be presented in a variety of forms such as:

- **Written report**
- **Written as a booklet, brochure or poster**
- **Powerpoint presentation**
- **Video**

What makes a winning entry?

- The topic of the investigation should be relevant, original and creative. It should address an issue of significance that may be of a social, local or personal nature.
- The approach should be original, creative and resourceful and integrate a range of mathematical concepts and processes.
- Present the investigation in a legible, logical and appealing manner.
- The report should include:
 - Clear questions/aims for investigation and predicts results and/or describes a hypothesis to be tested.
 - Explanation of how and why the topic is chosen and the approach to the investigation.
- 3-5min video (max file size 1G, format .mp4 .avi or .mov) All video should be clearly audible and easy to watch. The film technique will not be judged, however judges need to gain an understanding of your project.

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- Details of the materials used and the procedure lists the mathematical strategies and content that have been used in the investigation.
- Describes how the mathematical strategies and content have been used to achieve results.
- Evidence of replication of results (if appropriate), accuracy and thoroughness
- Analyses their findings and publishes these appropriately. Results, observations, measurements, graphics and text uses correct mathematical terms and symbols and uses accurate mathematical skills.
- Discussion of the results referring to the aims.
- Explanation of errors and anomalies and analyses mathematical connections within the investigation.
- Uses critical and creative thinking to explore mathematics within the investigation.
- Reasonable conclusion
- Suggestions for further research
- Appropriately acknowledge any assistance. Clarify which aspects of the project were devised and carried out alone and which aspects were not and what sort of assistance was provided.
- Has provided detailed evidence of work (such as draft, workings and/or notes) ensuring the investigation is a true representation of learning and understanding.

Winning entries in this category may be entered in the **National Maths Talent Quest**.

The focus of the **Maths Talent Quest** is on the process of mathematical investigations. Open to all primary and secondary students, the Maths Talent Quest aims to promote interest in mathematics and foster positive attitudes amongst students, teachers and parents. Looking at real life situations and finding that mathematics is everywhere helps capture the imagination of both teachers and students alike. The **Maths Talent Quest** allows students to investigate mathematics on an individual, group or class basis with the opportunity to have fun exploring mathematics in real life situations. Assessment through a rubric helps to evaluate students' progression through the process strands.

Some ideas to get you started

- Investigate a particular theme following normal class lessons in a particular area.
- An excursion to the Zoo, museum, or historical village could provide a useful source of ideas and motivation for your project.
- Current events or special celebrations such as the International Year of Food Design or Centenary of the Australian Airforce may also prove a starting point.
- Investigate the mathematical content of a specific interest e.g. maths in basketball, budgeting for a holiday.

Judging Criteria



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MATHEMATICAL INVESTIGATIONS

		5 Exceed expectations of student's learning level	4	3 Evident and appropriate to learning level	2	1	0 Not Evident
Investigative Process	Mathematical Content and Understanding	Investigates detailed mathematical content and concepts that are thought-provoking and challenge the student.					
	Mathematical Process	Completes a mathematical investigation that thoroughly examines the subject. Recognises and makes relevant high-level mathematical connections with everyday experiences. Uses correct mathematical language and terminology. Uses correct and efficient strategies. Monitors strategies and progress and/or considers alternative strategies as needed. Consistently uses accurate mathematics and systematic reasoning to make decisions and reach conclusions.					
Maths Focus	Presentation and Originality	A highly original investigation that displays evidence of student's personal ideas as well as other relevant information and resources. A range of references together with acknowledgement of support (including the internet, teachers, parents etc.)					
	Coherence	The investigation has explicit aims, a thorough plan and clearly stated conclusions. Explanations are very clear, effectively detailed explanations about how and why solutions or conclusions are reached. Presentation is neat, very well-organised, legible and captures the reader's interest					
	Acknowledgements	Acknowledges resources used (including reference materials and assistance from other people)					
	Evidence	Has provided detailed evidence of work (such as draft, workings and/or notes) ensuring the investigation is a true representation of the student's learning and understanding					
	TOTAL						