Mathematical Association of South Australia

Government of South Australia
Department for Education

MASA Junior Secondary Mathematics Enrichment Project 2021

Jointly sponsored by The Mathematical Association of SA Inc.
And
The Department for Education

This project is designed to align with the implementation of the Australian Curriculum and the Department for Education STEM, and Literacy and Numeracy Strategies.

The **Australian Curriculum** requires all mathematics students to be able to demonstrate the four proficiencies at all year levels. How will you get your students to demonstrate their proficiency in Problem Solving?

Problem Solving *involves students developing the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively. Students formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, when they design investigations and plan their approaches, when they apply their existing strategies to seek solutions, and when they verify that their answers are reasonable.*

Problem Solving includes formulating, and modelling practical situations

What better way to allow your students to develop and show these capabilities and proficiencies than giving them the opportunity to undertake a mathematical investigation, create a mathematical artefact or research a mathematical idea?

1. BACKGROUND AND INTRODUCTION

The aim of this project is to involve students, regardless of their levels of mathematical experience, in a cooperative and enjoyable project activity of their choice. Participants will gain invaluable experience in areas that SACE mathematics (and other subjects as well) demand e.g. directed investigations, project work and a literacy requirement. By undertaking an investigation, they are demonstrating many of the capabilities and proficiencies required by the Australian Curriculum.

2. POSSIBLE PROJECTS

Students may choose **any** area of interest, provided that there is **a clear evaluation of the mathematical content** in the chosen activity. e.g. a conclusion in a statistics project or an evaluation in a game entry.

Class teachers can give students ideas and inspiration as well as a timeline for preparation. The MASA website has several examples to assist teachers in directing students to possible topics

For example:
Students could be encouraged to investigate a particular theme following formal class lessons in that area.

Another approach may be to use the “Find out all you can about ...” approach to initiate brainstorming.

An excursion to a building site, farm, factory, supermarket or courtroom may provide useful ideas and motivation.

Students may wish to investigate the mathematics of their particular area of interest - eg sport, recreation, spending money, watching television, computing applications, informatics.

3. FORMAT OF ENTRIES

- Entries may be in whatever format students desire.
- However, fragile projects do risk being damaged in transit if they are sent interstate for the National Mathematics Talent Quest.

  NB Outstanding entries may be entered in the AAMT National Mathematics Talent Quest which are judged in Victoria.

Where possible please provide an electronic copy.

Written:	Should be typed or **neatly** handwritten, pages should be numbered and securely bound - **no loose sheets**. Entries can be in the form of: essays, play scripts, collection of poems or letters, booklet-text with illustrations, newspaper format or anything else that the students choose.
Posters:	Should convey an idea briefly and clearly, and generally *not* contain a great deal of written information. Should have visual impact. It may be necessary to provide a separate written component if it is felt that the poster does not contain enough information.
Film, Video or Audio Tape:	Entries must have appropriate documentation, be entertaining to listen to or watch, and reinforce a mathematical concept or principle. **Please check that your project works on several different platforms. If the judges cannot view the file they will not consider the project.**
Photographic Essay:	A collection of photographs which tell a story or display a mathematical idea. Each entry should be accompanied by a written description explaining the student’s thoughts.
Models:	May be either static or working. Models requiring construction must have clear instructions for doing so. Models should be original, skilfully constructed and demonstrate a mathematical principle. **NB**: Kit models should **not** be entered, unless there is substantial, original student input as well. Explanatory notes should accompany all models.

Games: Should have clear directions and be of relatively sturdy construction, allowing for ease of transport.

Computing Applications: **It is the responsibility of the entrants to supply all required hardware & software for judging purposes.**

Entrants may use programming, spreadsheets, data base, word processing or any other multimedia formats.

Please check that your project works on several different platforms. If the judges cannot run the application they not consider the project.

Include anything else that the students deem appropriate as long as there is a clear description of the mathematics involved.

In anticipation of students doing SACE Mathematics in future years it is may be useful that the Project/Investigation be similar to a mathematical investigation as required for assessment by the SACE Board.

The following notes are included as a guide in line with the SACE Board requirements.

A report on the mathematical investigation may take a variety of forms, but would usually include the following:

- an outline of the problem to be explored
- the method used to find a solution
- the application of the mathematics, including
  - generation or collection of relevant data and/or information, with a summary of the process of collection
  - mathematical calculations and results, using appropriate representations
  - discussion and interpretation of results, including consideration of the reasonableness and limitations of the results
- the results and conclusions in the context of the problem.

A bibliography and appendices, as appropriate, may be used.

The format of an investigation report may be written or multimodal.

4. ENTRY DETAILS

This project is open **FREE of charge** to all students, regardless of their levels of mathematical experience, from Years 8 to 10. Entries may be from individuals, groups of at most five members, or from classes (which may involve six or more students).

Entries must reach the MASA office by Friday 20th August 2021.

All entries submitted for judging should be accompanied by the appropriate cover sheet and should have all of the following information.

a. A Project Title
b. A Report which should include discussion of:
   - composition and formation of group if appropriate
   - selection of topic
   - any changes of ideas
   - ideas for improvement
   - conclusions
   - benefits gained

c. Acknowledgment of any assistance by adults (including teachers) in the preparation of the entry for submission.
d. A Bibliography listing all references used in researching the project.
e. There is no upper or lower limit on the 'length' of entries, but material should be relevant and not mere 'padding' for effect.

5. IMPORTANT DATES

Registration: **2 July 2021**
Entries Submitted **20 August 2021** All Entries to MASA office, during office hours Monday - Friday 9:30 am - 4.30 pm
Presentation Ceremony to be held on 25 October 2021

Office:
The Mathematical Association of South Australian Inc
80 Payneham Road, Stepney 5069

Postal Address:
The Mathematical Association of South Australian Inc
P.O. Box 94
Stepney 5069

6. JUDGING OF ENTRIES - Guidelines for Schools

All entries will be judged **for cash prizes** on following aspects of the chosen projects:

Choice of topic
Investigative processes
Communication of findings
Mathematical processes
Creativity
Acknowledgement
Evidence

For more details, check the Mathematics Enrichment Project Rubric

- Winning entries may be required for general display at future promotional activities of MASA.
- It is the responsibility of the entrants to supply all required hardware & software for judging purposes. Entrants may use programming, spreadsheets, data base, word processing or any other multimedia formats. Please contact the MASA if you have any queries.
- Schools are responsible for the transportation of their entries to and from judging.
- The judges' decision will be final and no correspondence will be entered into.
- Prizes may not be awarded in a category, if Judges deem the standard of entries to be inadequate.