Mathematics at Melville Senior High School

At Melville Senior High School, we are constantly looking to the future and the skills our students need.

We are the M in STEM and play a significant role in all areas of study and careers through the development of skilled, logical thinkers.

Mathematics is a subject to explore and enjoy and our team of qualified and enthusiastic educators, work towards assisting students in achieving the success of which they are capable and deserve. Our emphasis on logical thinking and problem solving, reflecting the requirements of The Western Australian Curriculum, aims to provide opportunities for skill development and understanding of applications of mathematical techniques.

The structure of our courses*

Our **Year 7** students complete a common course and common assessment tasks throughout the year. The Gifted and Talented and Academic Extension classes explore further concepts and delve deeper in topics of interest.

Our **Year 8** students are streamed into one of three pathways (except for Gifted and Talented students, who automatically go into Pathway 1), primarily based on their achievement in Year 7, but also teacher recommendations and communication with parents. Movement between pathways is possible, should the need exist, and the space be available. We do our best to deliver a program suited to the child's skills and knowledge.

Our **Year 9** students are streamed into one of three pathways for the entire year. The Gifted and Talented students continue in Pathway 1. The streaming will primarily be based on results at the end of Year 8, in the first instance, but movement may be possible should a student flourish or show need for further assistance during the year.

Our **Year 10** students continue their Year 9 pathway (please note that minimal changes should only occur at the beginning of Year 10 and at the end of semester one and only if deemed necessary). Students should have in mind very early which course they wish to choose for upper school studies, which reflects their interests and is appropriate for their level of skill.

Our students in Years **11 and 12** who wish to further their studies in Mathematics can choose from following:

- Mathematics Specialist (must be chosen with Methods)
- Mathematics Methods
- Mathematics Applications
- Mathematics Essential (General course – non-ATAR)

All assessment and course outlines show what is being covered and when, throughout the year. Students will also receive reminders and specific details of their assessments through Connect notices.

***Please note that students are **not locked into a particular pathway for the entire time**. Students' mathematical skills develop at different rates and we do our best to accommodate each student in the course which best suits their needs at that time. Pathway streaming is based on student results, including AEC, teacher recommendation, communication with parents and, in the case of Year 10 students, which areas in Mathematics they wish to pursue in the future - reflective of their level of skill.

Year 7 Mathematics at Melville Senior High School

- Mainstream
- Academic Extension
- Gifted and Talented

Year 7 – Mainstream (Classes 5MA7Y_2, 5MA7Y_3, 5MA7Y_5, 5MA7Y_6, 5MA7Y_7)

Students use ideas about number, algebra, measurement, geometry, statistics and probability and mathematical ways of representing patterns and relationships to describe, interpret and reason about their social and physical world. Mathematics plays a key role in the development of students' numeracy and assists learning across the curriculum. These are mixed ability classes.

Year 7 – AEC (Classes 5MA7Y_1, 5MA7Y_4)

Students in our **A**cademic **E**xtension **C**ourse will complete all the mainstream coursework as well as participating in some extension work. Students in AEC classes are to earn their place and maintain a high level of achievement (including an A grade in Mathematics throughout the year) in order to remain in AEC Mathematics.

Year 7 – Gifted and Talented (Classes 5G&T7Y_1)

Students also complete the mainstream course but are exposed to problems and activities requiring higher level thinking. It is compulsory for our Gifted and Talented students to compete in the Australian Mathematics Competition each year. As they often complete the coursework in quicker time, enrichment tasks form part of their weekly routine in Mathematics.

Assessment

Students complete common assessment tasks throughout the year and NAPLAN testing in Term 1. Their individual portfolios of work will be returned at the end of the year.

Students will complete an examination in Semester 2.

In each semester, students receive a Learning Area Grade (A, B, C, D or E).

Year 8 Mathematics at Melville Senior High School

At this year level:

- **understanding** includes describing patterns involving indices and recurring decimals, identifying commonalities between operations with algebra and arithmetic, connecting rules for linear relations with their graphs, explaining the purpose of statistical measures and explaining measurements of perimeter and area
- **fluency** includes calculating accurately with simple decimals, indices and integers; recognising equivalence of common decimals and fractions including recurring decimals; factorising and simplifying basic algebraic expressions and evaluating perimeters and areas of common shapes and volumes of three-dimensional objects
- **problem-solving** includes formulating and modelling practical situations involving ratios, profit and loss, areas and perimeters of common shapes and using two-way tables and Venn diagrams to calculate probabilities
- **reasoning** includes justifying the result of a calculation or estimation as reasonable, deriving probability from its complement, using congruence to deduce properties of triangles, finding estimates of means and proportions of populations.

From the beginning of the year, students will be placed into one of three streams.

Semester 1 and Semester 2 (movements may occur at the end of Semester 1 based on student results).

Students are initially assigned to classes based on their results in Year 7 and teacher recommendations.

Pathway 1 – (Classes 5G&T8Y_1, 5MA8Y_1, 5MA8Y_4) For more able students. Studies are completed with greater depth and breadth for understanding. Enrichment activities provided to motivate and develop high level thinking skills.

Pathway 2 – (Classes 5MA8Y_2, 5MA8Y_5, 5MA8Y_6) Mainstream course where students are given opportunities to achieve success and develop their mathematical skills.

Pathway 3 – (Classes 5MA8Y_3, 5MA8Y_7) For students requiring extra assistance in a smaller group setting with more practical learning activities.

Assessment

Students receive a Learning Area grade (A, B, C, D or E) and an assigned Pathway grade (A, B, C, D or E). Learning Area grades are based on comparisons with the entire Year 8 cohort whereas Pathway grades are determined by student progress within their path of study.

Please note that as students complete work to a different level and at different rates, but all based on the Year 8 curriculum, grades are allocated as follows:

- Pathway 1 – students able to receive Learning Area grade (A – E) and a Pathway grade (A – E)
- Pathway 2 – students able to receive Learning Area grade (B – E) and a Pathway grade (A – E)
- Pathway 3 – students able to receive Learning Area grade (C – E) and a Pathway grade (A – E)

Examples – (i) A student in Pathway 2 may receive a Learning Area Grade ‘C’ and a Pathway Grade ‘B’. (ii) A student in Pathway 1 may receive a Learning Area Grade of ‘A’ but a Pathway grade of ‘C’ if they are completing the Pathway 1 course at a satisfactory level compared with other students in this pathway.

Each student’s portfolio of work will be returned at the end of the year.

Year 9 Mathematics at Melville Senior High School

At this year level:

- **understanding** includes describing the relationship between graphs and equations, simplifying a range of algebraic expressions and explaining the use of relative frequencies to estimate probabilities and of the trigonometric ratios for right-angle triangles
- **fluency** includes applying the index laws to expressions with integer indices, expressing numbers in scientific notation, listing outcomes for experiments, developing familiarity with calculations involving the Cartesian plane and calculating areas of shapes and surface areas of prisms
- **problem-solving** includes formulating and modelling practical situations involving surface areas and volumes of right prisms, applying ratio and scale factors to similar figures, solving problems involving right-angle trigonometry and collecting data from secondary sources to investigate an issue
- **reasoning** includes following mathematical arguments, evaluating media reports and using statistical knowledge to clarify situations, developing strategies in investigating similarity and sketching linear graphs.

Semester 1 and Semester 2 (movements may occur at the end of Semester 1 based on student results).

Students are initially assigned to classes based on their results in Year 8 and teacher recommendations.

Pathway 1 – (Classes 5G&T9Y_1, 5MA9Y_1, 5MA9Y_4) For more able students. Studies are completed with greater depth and breadth for understanding. Enrichment activities provided to motivate and develop high level thinking skills.

Pathway 2 – (Classes 5MA9Y_2, 5MA9Y_5, 5MA9Y_6) Mainstream course where students are given opportunities to achieve success and develop their mathematical skills.

Pathway 3 – (Classes 5MA9Y_3, 5MA9Y_7) For students requiring extra assistance in a smaller group setting with more practical learning activities.

Assessment

Students receive a Learning Area grade (A, B, C, D or E) and an assigned Pathway grade (A, B, C, D or E). Learning Area grades are based on comparisons with the entire Year 9 cohort whereas Pathway grades are determined by student progress within their path of study. They are also expected to complete NAPLAN testing in Term 1.

Please note that as students complete work to a different level and at different rates, but all based on the Year 9 curriculum, grades are allocated as follows:

- Pathway 1 – students able to receive Learning Area grade (A – E) and a Pathway grade (A – E)
- Pathway 2 – students able to receive Learning Area grade (B – E) and a Pathway grade (A – E)
- Pathway 3 – students able to receive Learning Area grade (C – E) and a Pathway grade (A – E)

Examples – (i) A student in Pathway 2 may receive a Learning Area Grade ‘C’ and a Pathway Grade ‘B’. (ii) A student in Pathway 1 may receive a Learning Area Grade of ‘A’ but a Pathway grade of ‘C’ if they are completing the Pathway 1 course at a satisfactory level compared with other students in this pathway.

Each student’s portfolio of work will be returned at the end of the year.

Year 10 Mathematics at Melville Senior High School

At this year level:

- **understanding** includes applying the four operations to algebraic fractions, finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs, comparing simple and compound interest in financial contexts and determining probabilities of two- and three-step experiments
- **fluency** includes factorising and expanding algebraic expressions, using a range of strategies to solve equations and using calculations to investigate the shape of data sets
- **problem-solving** includes calculating the surface area and volume of a diverse range of prisms to solve practical problems, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities and investigating independence of events
- **reasoning** includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets.

Semester 1 and Semester 2 (movements may occur at the end of Semester 1) *

Pathway 1 – **(Classes 5G&TXY_1, 5MAXY_1, 5MAXY_4)** for students aiming for Mathematics Specialist, Methods or Applications course in upper school. Students complete the Year 10 course as outlined by SCSA with extension and enrichment, including work from 10A and introductory upper school courses. The **Casio Classpad** is a requirement for this course.

Pathway 2* – **(Classes 5MAXY_2, 5MAXY_3, 5MAXY_5, 5MAXY_6)** for students aiming to study the Mathematics Applications or Mathematics Essential course in upper school. Students complete the Year 10 course as outlined by SCSA.

Pathway 3* – **(Classes 5MAXY_7, 5MAXY_8)** for students aiming to study the Mathematics Essential course in upper school or not choosing Mathematics in upper school. Students work from the Year 10 course at a slower pace with an aim at C grade achievement.

The following table shows the pre-requisites for selection of upper school courses at our school:

Course	**Pre-requisite**	**STEM Careers (some examples)**
Mathematics Specialist	'A' grade in Year 10 Mathematics Pathway 1 (Semester 1 and Semester 2) + Teacher recommendation + Enrolled in Mathematics Methods	Engineering, Physical Sciences, Mathematics
Mathematics Methods	'A' grade in Year 10 Mathematics Pathway 1 (Semester 1 and Semester 2) + Teacher recommendation	Statistics, Logistics, Architecture, Communications
Mathematics Applications	'B' grade or higher in Year 10 Mathematics Pathway 2	Teaching, logistics, nursing, cyber forensics, design
Mathematics Essential (General course)	Interest in mathematics and the appropriate work ethic (Project based work to be completed to high standard and submitted on time and students required to sit an EST – externally set task/test in Year 12)	Construction, trades, warehousing, logistics

*Please note that extra assistance is also provided for students who are required to complete OLNA.

Senior School Mathematics at Melville Senior High School

Mathematics Specialist - This course provides opportunities to develop rigorous mathematical arguments and proofs and to use mathematical models more extensively. Mathematics Specialist is the only ATAR Mathematics course that should not be taken as a stand-alone course and is to be studied in conjunction with the Mathematics Methods ATAR course as preparation for entry to specialised university courses such as engineering, physical sciences and mathematics. Students are challenged in many areas including vectors, complex numbers, statistics and matrices.

It is designed for those with the 'spark' of wanting to know not just how, but why.

Mathematics Methods* - This course is designed for students whose future pathways may involve mathematics and statistics and their applications in a range of disciplines at the tertiary level. This course focuses on the use of calculus and statistical analysis and is highly enjoyed by students who achieve well in Year 10 and seek greater mathematical understanding and a love for the subject area.

As we have multiple Methods classes, it is planned that all common assessment tasks will be held on Tuesday afternoons, supervised by staff.

Mathematics Applications* – This is probably the most attractive course for the students who do well in Mathematics, know they require it for further studies, but need to spend time on other studies as well. Students in this course are more intrigued by how mathematics is used in everyday examples rather than the exploration of pure mathematics or calculus. This course focuses on the use of mathematics to solve problems in contexts that involve financial modelling, geometric and trigonometric analysis, graphical and network analysis, and growth and decay in sequences.

As we have multiple Applications classes, it is planned that all common assessment tasks will be held on Tuesday afternoons, supervised by staff.

Mathematics Essential – If you are preparing for post-school options of employment and further training, then this is the General course for you. It provides students with the mathematical knowledge, skills and understanding to solve problems in real contexts for a range of workplace, personal, further learning, and community settings.

*NOTE - TISC would like to advise that from the 2023 school year (relevant to university admission from 2024), Mathematics Applications and Mathematics Methods will no longer be an unacceptable subject combination, for the purposes of calculating the ATAR.

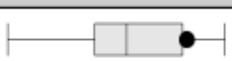
This is an example of a Task report which will be emailed home regularly by the class teacher.

It provides an excellent overview of how your child is progressing on personal level (the dot) and in relation to other students in their course.

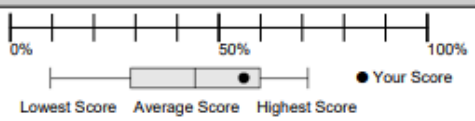
MELVILLE SENIOR HIGH SCHOOL

Course Progress Report Semester 2 2022

Student Number:

Unit Results		Unit Mark %	Unit Mark Distribution	Rank	Grade
Mathematics Methods ATMAM		80		5	A
Task Results	**Task Mark**	**Task Mark %**	**Task Mark Distribution**	**Rank**	**Weight**
1. Test 1 - Differentiation	37	74.0		5	8
2. Investigation	15	68.2		16	10
3. Test 2 - FTC, Antidifferentiation and Exp	46	92.0		1	8
4. Test 3 - Trig and DRV	45	84.9		5	8
5. Semester 1 Exam	68.7	68.7		8	15
6. Test 4 - Logarithms	47	94.0		2	8
7. Investigation	33	94.3		1	10
8. Test 5 - CRV, ND and Sampling	47	85.5		6	8
9. Semester 2 Exams	77.325	77.3		3	25

Key to unit distribution diagram



This diagram represents the spread of the student marks in this course. The black dot is your place in the group and the shaded region contains the middle 50% of all students studying this course.

Cohort size: 22

Teacher

Ms S. Rigelsford

If you require any further information on Mathematics at Melville Senior High School, please don't hesitate to contact your child's teacher and/or the Head of Learning Area.

Ms Simone Rigelsford

Head of Learning Area – Mathematics

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