

# 2024 Semester 1 - Year 10 A Unit Outline

## Mathematics

**Teacher(s):** *Brandon Steele*

**Faculty:** *Mathematics*

**Unit Duration:** Semester 1, 2024

The study of mathematics is central to the learning, development and prospects of all young Australians. Mathematics provides students with essential mathematical knowledge, skills, procedures and processes in number, algebra, measurement, space, statistics and probability. It develops the numeracy capabilities that all students need in their personal, work and civic lives, and provides the fundamentals on which mathematical specialties and professional applications of mathematics are built.

**Australian Curriculum Achievement Standard:** By the end of Year 10, students recognise the effect of approximations of real numbers in repeated calculations. They use mathematical modelling to solve problems involving growth and decay in financial and other applied situations, applying linear, quadratic and exponential functions as appropriate, and solve related equations, numerically and graphically. Students make and test conjectures involving functions and relations using digital tools. They solve problems involving simultaneous linear equations and linear inequalities in 2 variables graphically and justify solutions.

Students interpret and use logarithmic scales representing small or large quantities or change in applied contexts. They solve measurement problems involving surface area and volume of composite objects. Students apply Pythagoras' theorem and trigonometry to solve practical problems involving right-angled triangles. They identify the impact of measurement errors on the accuracy of results. Students use mathematical modelling to solve practical problems involving proportion and scaling, evaluating and modifying models, and reporting assumptions, methods and findings. They use deductive reasoning, theorems and algorithms to solve spatial problems. Students interpret networks used to represent practical situations and describe connectedness

They plan and conduct statistical investigations involving bivariate data. Students represent the distribution of data involving 2 variables, using tables and scatter plots, and comment on possible association. They analyse inferences and conclusions in the media, noting potential sources of bias. Students compare the distribution of continuous numerical data using various displays, and discuss distributions in terms of centre, spread, shape and outliers. They apply conditional probability to solve problems involving compound events. Students design and conduct simulations involving conditional probability, using digital tools.

**Unit Description:** Learning in Mathematics builds on each student's prior learning and experiences. Students engage in a range of approaches to learning and doing Mathematics that develop their understanding of and fluency with concepts, procedures and processes by making connections, reasoning, problem-solving and practice. Proficiency in Mathematics enables students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently.

These skills are developed through the study of number, algebra, measurement, space, statistics, and probability.

### Essential Learning Outcomes developed from the Achievement Standards of the Australian Curriculum:

1. **V9.M.10.03** - Makes and tests conjectures involving functions and relations using digital tools
2. **V9.M.10.04** - Solves problems involving simultaneous linear equations and linear inequalities in 2 variables graphically and justifies solutions.
3. **V9.M.10.02** - Uses mathematical modelling to solve practical problems involving proportion and scaling, evaluating and modifying models, and reports assumptions, methods and findings.
4. **V9.M.10.10** - Uses deductive reasoning, theorems and algorithms to solve spatial problems
5. **V9.M.10.05** Interprets and uses logarithmic scales representing small or large quantities or change in applied contexts.
6. **V9.MO.10.07** - Applies the logarithm laws
7. **V9.M.10.02** - Uses mathematical modelling to solve problems involving growth and decay in financial and other applied situations, applying linear, quadratic and exponential functions as appropriate, and solves related equations, numerically and graphically.
8. **V9.M.10.07** - Applies Pythagoras' theorem and trigonometry to solve practical problems involving right-angled triangles.
9. **V9.MO.10.05** - Describes the relationship between the unit circle and the trigonometric functions.

**Materials and Equipment Required:** Students are expected to arrive at every class with a class book/folder to write notes for that subject, a writing instrument and a Chromebook or similar, appropriate electronic device. Students may also be required to provide the following additional materials and equipment: *Scientific Calculator*

**Absences from Class:** Students who miss classes due to absence or excursions must negotiate with the class teacher to catch up missed work.

**Use of IT in Class:** A Google Classroom has been set up for this class. Students will be required to log into this Google Classroom regularly to access course material. Students must bring their Chromebook to all lessons, however, the use of these devices in class will be at the discretion of the teacher.

**Homework:** Any homework will be directly related to instruction and course requirements, will be assessed appropriately and may impact upon student grades. Examples of homework may include; catch up on missed classwork, revision of classwork, study for tests, assignment work, or preparation for a class presentation.

**Late Work:** Extensions may be negotiated with individual teachers before the due date

**Plagiarism:** Plagiarism is copying or using another's work and claiming it as your own. This includes copying, cutting and pasting text or using ideas directly from a text, the internet or some other source without appropriate referencing. If this happens, work may not be graded and students will be asked to discuss the assessment with the classroom teacher and Executive Teacher for that subject. Parents may be contacted as part of this process.

**Assessment Portfolio:** This contains evidence of work from the opportunities the students have been provided to demonstrate elements of the achievement standard.

**Portfolio Assessment Tasks for this subject will include:**

	Week / Date Due	Essential Learning
1. Algebraic Fractions	4	1,
2. Linear Relationships	8	2,
3. Geometric Reasoning	11	3, 4
4. Indices & Surds & logarithms	14	5, 6
5. Trigonometry	18	8, 9,
6. Financial Maths	20	7

**A-E Reporting Grade Descriptors** These are the grades and grade descriptors for reporting at the end of each Semester.

<b>A</b>	Demonstrating <b>excellent</b> achievement of what is expected (Consistently achieving a proficiency level of 4 or above in each of the Essential Learnings)
<b>B</b>	Demonstrating a <b>high</b> achievement of what is expected (Consistently achieving a proficiency level of between 3 and 4 in each of the Essential Learnings)
<b>C</b>	Demonstrating <b>satisfactory</b> achievement of what is expected (Achieving a proficiency level of 3 across the Essential Learnings)
<b>D</b>	Demonstrating <b>partial</b> achievement of what is expected (Achieving a proficiency of between 1 and 3 across the Essential Learnings)
<b>E</b>	Demonstrating <b>limited</b> achievement of what is expected (Achieving a proficiency of 1 or less in each of the Essential Learnings)

**S** **Status** is awarded where unavoidable circumstances have prevented assessment. Must be negotiated with the Principal.

#### Grade Descriptors and the "C" grade

In ACT public schools the Australian Curriculum Achievement Standard is aligned with a 'C' grade. The 'C' grade indicates that your child has demonstrated a satisfactory level of knowledge, understanding and skill in relation to the Achievement Standard.

#### Appeals

*A student must initiate an appeal for any grade with their subject teacher. If a student is dissatisfied with that initial process, they must pursue further appeal through the Faculty Executive Teacher for that subject.*

#### Executive Teacher

Colin Montgomery

29/01/2024