2026 Semester 1 - Year 9 Unit Outline

Mathematics

Teacher(s): *Eva-Marie Bugledich, Trevor Horrell, Jen Comans, Colin Montgomery, Ping Zhang*

Faculty: *Mathematics* **Unit Duration:** Semester 1, 2026

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 9, students recognise and use rational and irrational numbers to solve problems. They extend and apply the exponent laws with positive integers to variables. Students expand binomial products, and factorise monic quadratic expressions. They find the distance between 2 points on the Cartesian plane, and the gradient and midpoint of a line segment. Students use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions. They graph quadratic functions and solve monic quadratic equations with integer roots algebraically. Students describe the effects of variation of parameters on functions and relations, using digital tools, and make connections between their graphical and algebraic representations.

They apply formulas to solve problems involving the surface area and volume of right prisms and cylinders. Students solve problems involving ratio, similarity and scale in two-dimensional situations. They determine percentage errors in measurements. Students apply Pythagoras' theorem and use trigonometric ratios to solve problems involving right-angled triangles. They use mathematical modelling to solve practical problems involving direct proportion, ratio and scale, evaluating the model and communicating their methods and findings. Students express small and large numbers in scientific notation. They apply the enlargement transformation to images of shapes and objects, and interpret results. Students design, use and test algorithms based on geometric constructions or theorems.

They compare and analyse the distributions of multiple numerical data sets, choose representations, describe features of these data sets using summary statistics and the shape of distributions, and consider the effect of outliers. Students explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view. They determine sets of outcomes for compound events and represent these in various ways. Students assign probabilities to the outcomes of compound events. They design and conduct experiments or simulations for combined events 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.9.01 -** Recognises and uses rational and irrational numbers to solve problems
2. **V9.M.9.02 -** Extends and applies the exponent laws with positive integers to variables**.**
3. **V9.M.9.04 -** Finds the distance between 2 points on the Cartesian plane, and the gradient and midpoint of a line segment.
4. **V9.M.9.05 -** Uses mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions.
5. **V9.M.9.06 -** Graphs quadratic functions and solves monic quadratic equations with integer roots algebraically.
6. **V9.M.9.07 -** Describes the effects of variation of parameters on functions and relations, using digital tools, and makes connections between their graphical and algebraic representations.
7. **V9.M.9.08 -** Applies formulas to solve problems involving the surface area and volume of right prisms and cylinders.
8. **V9.M.9.10 -** Determines percentage errors in measurements.
9. **V9.M.9.11 -** Applies Pythagoras' theorem and uses trigonometric ratios to solve problems involving right-angled triangles.
10. **V9.M.9.13 -** Expresses small and large numbers in scientific notation.

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. Exponent Laws and Scientific Notation	**4**	**2, 10**
2. Pythagoras & Trigonometry	**8**	**1, 9**
3. Linear Functions & Relationships (inc. Gradient, Midpoint & Distance)	**12**	**3, 4, 6**
4. Quadratics & Non-Linear Relationships	**15**	**4, 5, 6**
5. Measurement	**19**	**7, 8**

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

A	Demonstrating **excellent** achievement of what is expected (Consistently achieving a proficiency level of 4 or above in each of the Essential Learnings)
B	Demonstrating a **high** achievement of what is expected (Consistently achieving a proficiency level of between 3 and 4 in each of the Essential Learnings)
C	Demonstrating **satisfactory** achievement of what is expected (Achieving a proficiency level of 3 across the Essential Learnings)
D	Demonstrating **partial** achievement of what is expected (Achieving a proficiency of between 1 and 3 across the Essential Learnings)
E	Demonstrating **limited** 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 _____ 16/12/2025 _____