

2024 Semester 1 - Year 8 Unit Outline

Mathematics

Teacher(s): Jennifer Comans, Wendy Chen, Colin Montgomery



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 8, students recognise irrational numbers and terminating or recurring decimals. They apply the exponent laws to calculations with numbers involving positive integer exponents. Students solve problems involving the 4 operations with integers and positive rational numbers. They use mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts. Students apply algebraic properties to rearrange, expand and factorise linear expressions. They graph linear relations and solve linear equations with rational solutions and one-variable inequalities, graphically and algebraically. Students use mathematical modelling to solve problems using linear relations, interpreting and reviewing the model in context. They make and test conjectures involving linear relations using digital tools. Students use appropriate metric units when solving measurement problems involving the perimeter and area of composite shapes, and volume of right prisms. They use Pythagoras' theorem to solve measurement problems involving unknown lengths of right-angle triangles. Students use formulas to solve problems involving the area and circumference of circles. They solve problems of duration involving 12- and 24-hour cycles across multiple time zones. Students use 3 dimensions to locate and describe position. They identify conditions for congruency and similarity in shapes and create and test algorithms designed to test for congruency and similarity. Students apply the properties of quadrilaterals to solve problems. They conduct statistical investigations and explain the implications of obtaining data through sampling. Students analyse and describe the distribution of data. They compare the variation in distributions of random samples of the same and different size from a given population with respect to shape, measures of central tendency and range. Students represent the possible combinations of 2 events with tables and diagrams, and determine related probabilities to solve practical problems. They conduct experiments and simulations using digital tools to determine related probabilities of compound events.

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.8.01 Recognises irrational numbers and terminating or recurring decimals.
- 2. V9.M.8.02 Applies the exponent laws to calculations with numbers involving positive integer exponents.
- 3. V9.M.8.03 Solves problems involving the 4 operations with integers and positive rational numbers.
- 4. **V9.M.8.04** Uses mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts.
- 5. **V9.M.8.05** Applies algebraic properties to rearrange, expand and factorise linear expressions.
- 6. **V9.M.8.19** Represents the combinations of 2 events with tables and diagrams and determines related probabilities to solve practical problems.
- 7. **V9.M.8.20** Conducts experiments and simulations using digital tools to determine related probabilities of compound events.

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.	Integers & Irrational numbers	Week 4	1, 3
2.	Index Laws	Week 8	2
3.	Probability	Week 11	6, 7
4.	Percentages, Ratio & Rates	Week 16	4
5.	Algebraic Products and Factors	Week 21	5

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

30/01/2024