Year 8 Mathematics

Achievement

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 analyze 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.

Assessment Criteria

Using the marking guide provided, an overall level of achievement in this subject is determined by the teacher's judgment of the evidence presented in students' summative assessment. All assessment completed by students in Mathematics, unless noted on the task sheet, assess the following criteria:

- Understanding and fluency
- Problem-solving and reasoning

Delivery (mode, time requirements, lessons)

Each week, students participate in three one-hour live lessons conducted through Microsoft Teams. In addition to these sessions, they are expected to engage in independent study to complete tasks and assessments aligned with the Work Rate Calendar. All course materials are available via the learning management system.

Student Requirements

Computer, access to internet, email, printer, scanner, headset with microphone, audio visual software/devices, scientific calculator, exercise book, stationery.

Year 8 Mathematics (Semester 1)

<table>
<tr><td colspan="3">Units and Learning Experiences, Summative Assessment, Criteria Assessed,
Approximate timing/due date of Summative Assessment</td></tr>
<tr>
<td rowspan="6">Semester 1</td>
<td rowspan="3">Term 1</td>
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Unit 1
Number and place value
Represent, compare and order integers, and solve problems involving the four operations and rational numbers.
Financial mathematics
Make connections between percentages, fractions and decimals and apply this to percentage increase or decrease situations, and problem solve in a range of contexts including financial situations such as GST and Profit and Loss.
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Unit 2
Real numbers
Identify terminating and recurring decimals, link fractions to terminating and recurring decimals and explore irrational numbers in relation to Pi.
Chance
Describe and calculate the probability of 'and', 'or', and 'not' events, represent events in Venn diagrams, tree diagrams and two-way tables and solve related problems, identify complementary events and use the sum of probabilities to solve problems. Use simulations and digital tools to replicate probability experiments.
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Summative Assessment, due date:

Exam: Short answer questions (Week 5)
Written Task (Week 9). It is a Problem Solving and Modelling Task (PSMT) done as an assignment.

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<tr>
<td rowspan="3">Term 2</td>
<td>
Unit 3
Number and place value
Express numbers in index notation, establish the index laws for multiplication, division, zero index and power of a power with whole number bases and positive integral indices.
Patterns and algebra
Rearrange and simplify linear expressions by recognizing like terms and using the distributive law. Expand and factorize algebraic expressions.
Measurement
Use and apply Pythagoras' Theorem to find unknown sides and angles and solve complex or irregular shapes.
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Unit 4
Measurement
Convert units of measure for length and area, revise perimeter and area of rectangles, parallelograms and triangles, develop formulas for rhombuses, kites, trapeziums and circles, calculate the perimeter and area of rhombuses, kites, trapeziums and circles, problem solve and reason involving perimeter, circumference and area. Solve problems involving the perimeter and area of composite shapes.
Introduction to Solving Equations:
Solve one and two step equations and use algebraic techniques to model and solve linear equations applied to practical contexts.
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Summative Assessment, due date:

Exam: Short answer questions (Week 5)
Exam: Short answer questions (Week 9)

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Year 8 Mathematics (Semester 2)

		Units and Learning Experiences, Summative Assessment, Criteria Assessed, Approximate timing/due date of Summative Assessment
Semester 2	**Term 3**	**Unit 5** **Data representation and interpretation (Statistics)** Collect, organise and display data, interpret data displayed in tables and graphs, connect samples and populations, explore the effect of sample size, calculate measures of central tendency (mean, mode, median), review outliers and their effect on measures of central tendency, identify sources of bias and apply this knowledge to make hypotheses and support conclusions. Examine issues involving primary and secondary data sources. Wherever possible, this unit will focus on comparative statistics. The emphasis is on integrating skills and procedures into a single process to reach evidence-based conclusions. **Measurement** Solve time duration problems, use and apply 12 hour and 24-hour time formats, within and across time zones. Solve problems involving timetables.
		Unit 6 **Measurement and Linear and non-linear relationships** Recognize and use rates to solve problems involving the comparison of 2 related quantities of different use of measure. Use mathematical modelling to solve practical problems involving ratio and rates, including financial contexts. Review plotting points and Cartesian Plane - interpret, model and formulate patterns and relationships, represent patterns and relationships as rules, functions, tables and graphs and solve linear equations using graphical techniques. Solve simple linear inequalities.
		Summative Assessment, due date: • Exam: Short answer questions (Week 5) • Exam: Short answer questions (Week 9)
	Term 4	**Unit 7** **Linear and non-linear relationships** Apply number laws to algebraic expressions & equations, solve linear equations algebraically & graphically, connect patterns, linear functions, tables of values, graphs & worded statements, solve practical problems using algebraic modelling. **Geometric reasoning** Revise angle properties (co-interior, corresponding, alternate & vertically opposite). Identify the conditions for congruence and similarity of triangles, establish & apply the congruence tests (SAS, AAS, SSS, RHS), extend congruence of triangles to identify the properties of quadrilaterals & solve problems using the properties of congruent figures, reasoning & generalisations. Also apply and use the similarity tests to problems and proofs involving plane shapes.
		Unit 8 **Measurement** Review volume and capacity of right prisms, develop formulae for cylinders and solve practical problems involving these shapes including. flow rate problems and consideration of appropriate units.
		Summative Assessment, due date: • Short answer questions, Exam, Criteria: Understanding & Fluency, Problem solving, Reasoning (Week 8)

Disclaimer All of the above information is accurate at the time of development.