Government of **Western Australia**
School Curriculum and Standards Authority

Australian Curriculum: Mathematics

Year views (F-10)

- This document presents the curriculum with the proficiencies, content descriptions and achievement standards for each year.
- These documents are based on the Australian Curriculum as published as version 5.0 on 20/05/2013.
- The content description codes are hyperlinked to the Australian Curriculum Website where the elaborations and links to the General Capabilities and Cross-Curriculum Priorities can be viewed.
- Note that the Achievement Standards are presented by the Strands of the Curriculum.

TRIM: 2013/29931

Australian Curriculum: Mathematics - (Foundation)

	Proficiencies	Examples in this year	Achievement Standard *(organised by Strands)*
	Understanding	Connecting names, numerals and quantities	Number and Algebra By the end of the Foundation year, students make connections between number names, numerals and quantities up to 10. Students count to and from 20 and order small collections. Measurement and geometry They compare objects using mass, length and capacity. Students connect events and the days of the week. They explain the order and duration of events. They use appropriate language to describe location. They group objects based on common characteristics and sort shapes and objects. Statistics and probability Students answer simple questions to collect information.
	Fluency	counting numbers in sequences readily, continuing patterns, and comparing the lengths of objects directly	
	Problem solving	using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer	
	Reasoning	explaining comparisons of quantities, creating patterns, and explaining processes for indirect comparison of length	
	Sub-strands	**Content Descriptions**	
Number and Algebra	**Number and place value**	• Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point (ACMNA001) • Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond (ACMNA002) • Subitise small collections of objects (ACMNA003) • Compare, order and make correspondences between collections, initially to 20, and explain reasoning (ACMNA289) • Represent practical situations to model addition and sharing (ACMNA004)	
	Fractions and decimals		
	Real numbers		
	Money and financial mathematics		
	Patterns and algebra	• Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings (ACMNA005)	
	Linear and non-linear relationships		
Measurement and geometry	**Using units of measurement**	• Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language (ACMMG006) • Compare and order the duration of events using the everyday language of time (ACMMG007) Connect days of the week to familiar events and actions (ACMMG008)	
	Shape	• Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment (ACMMG009)	
	Geometric reasoning		
	Location and transformation	• Describe position and movement (ACMMG010)	
	Pythagoras and trigonometry		
Statistics and probability	**Chance**		
	Data representation and interpretation	• Answer yes/no questions to collect information (ACMSP011)	

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Australian Curriculum: Mathematics - (Year 1)

Proficiencies	Examples in this year
Understanding	connecting names, numerals and quantities, and partitioning numbers in various ways
Fluency	counting number in sequences readily forward and backwards, locating numbers on a line, and naming the days of the week
Problem solving	using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems and discussing the reasonableness of the answer
Reasoning	explaining direct and indirect comparisons of length using uniform informal units, justifying representations of data, and explaining patterns that have been created

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Develop confidence with number sequences to and from 100 by ones from any starting point. Skip count by twos, fives and tens starting from zero (ACMNA012) • Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line (ACMNA013) • Count collections to 100 by partitioning numbers using place value (ACMNA014) • Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Fractions and decimals	• Recognise and describe one-half as one of two equal parts of a whole. (ACMNA016)
	Real numbers	
	Money and financial mathematics	• Recognise, describe and order Australian coins according to their value (ACMNA017)
	Patterns and algebra	• Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018)
	Linear and non-linear relationships	
Measurement and geometry	**Using units of measurement**	• Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019) • Tell time to the half-hour (ACMMG020) • Describe duration using months, weeks, days and hours (ACMMG021)
	Shape	• Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
	Geometric reasoning	
	Location and transformation	• Give and follow directions to familiar locations (ACMMG023)
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen' (ACMSP024)
	Data representation and interpretation	• Choose simple questions and gather responses (ACMSP262) • Represent data with objects and drawings where one object or drawing represents one data value. Describe the display (ACMSP263)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 1, students describe number sequences resulting from skip counting by 2s, 5s and 10s. They identify representations of one half. They recognise Australian coins according to their value. Students explain time durations. Students count to and from 100 and locate numbers on a number line. They carry out simple additions and subtractions using counting strategies. They partition numbers using place value. They continue simple patterns involving numbers and objects.

Measurement and geometry

They describe two-dimensional shapes and three-dimensional objects. Students order objects based on lengths and capacities using informal units. They tell time to the half hour. They use the language of direction to move from place to place.

Statistics and probability

Students describe data displays. Students classify outcomes of simple familiar events. They collect data by asking questions and draw simple data displays.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials (v5.0 May 2013)

Australian Curriculum: Mathematics - (Year 2)

Proficiencies	Examples in this year
Understanding	connecting number calculations with counting sequences, partitioning and combining numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division
Fluency	counting numbers in sequences readily, using units iteratively to compare measurements, listing possible outcomes of chance events, and describing and comparing time durations
Problem solving	formulating problems from authentic situations, making models and using number sentences that represent problem situations, planning routes on maps, and matching transformations with their original shape
Reasoning	using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, describing connections between 2-D and 3-D representations, and creating and interpreting simple representations of data

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences (ACMNA026) • Recognise, model, represent and order numbers to at least 1000 (ACMNA027) • Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting (ACMNA028) • Explore the connection between addition and subtraction (ACMNA029) • Solve simple addition and subtraction problems using a range of efficient mental and written strategies (ACMNA030) • Recognise and represent multiplication as repeated addition, groups and arrays (ACMNA031) • Recognise and represent division as grouping into equal sets and solve simple problems using these representations (ACMNA032)
	Fractions and decimals	• Recognise and interpret common uses of halves, quarters and eighths of shapes and collections (ACMNA033)
	Real numbers	
	Money and financial mathematics	• Count and order small collections of Australian coins and notes according to their value (ACMNA034)
	Patterns and algebra	• Describe patterns with numbers and identify missing elements (ACMNA035) • Solve problems by using number sentences for addition or subtraction (ACMNA036)
	Linear and non-linear relationships	
Measurement and geometry	**Using units of measurement**	• Compare and order several shapes and objects based on length, area, volume and capacity using appropriate uniform informal units (ACMMG037) • Compare masses of objects using balance scales (ACMMG038) • Tell time to the quarter-hour, using the language of 'past' and 'to' (ACMMG039) • Name and order months and seasons (ACMMG040) • Use a calendar to identify the date and determine the number of days in each month (ACMMG041)
	Shape	• Describe and draw two-dimensional shapes, with and without digital technologies (ACMMG042) • Describe the features of three-dimensional objects (ACMMG043)
	Geometric reasoning	
	Location and transformation	• Interpret simple maps of familiar locations and identify the relative positions of key features (ACMMG044) • Investigate the effect of one-step slides and flips with and without digital technologies (ACMMG045) • Identify and describe half and quarter turns (ACMMG046)
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Identify practical activities and everyday events that involve chance. Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible' (ACMSP047)
	Data representation and interpretation	• Identify a question of interest based on one categorical variable. Gather data relevant to the question (ACMSP048) • Collect, check and classify data (ACMSP049) • Create displays of data using lists, table and picture graphs and interpret them (ACMSP050)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 2, students recognise increasing and decreasing number sequences involving 2s, 3s and 5s. They represent multiplication and division by grouping into sets. They associate collections of Australian coins with their value. Students identify the missing element in a number sequence. Students count to and from 1000. They perform simple addition and subtraction calculations using a range of strategies. They divide collections and shapes into halves, quarters and eighths. Students order shapes and objects using informal units. They tell time to the quarter hour and use a calendar to identify the date and the months included in seasons.

Measurement and geometry

Students recognise the features of three-dimensional objects. They interpret simple maps of familiar locations. They explain the effects of one-step transformations. They draw two- dimensional shapes. They describe outcomes for everyday events.

Statistics and probability

Students make sense of collected information. Students collect data from relevant questions to create lists, tables and picture graphs.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
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- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
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- Sustainability

Notes:

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials (v5.0 May 2013)

Australian Curriculum: Mathematics - (Year 3)

Proficiencies	Examples in this year
Understanding	connecting number representations with number sequences, partitioning and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry
Fluency	recalling multiplication facts, using familiar metric units to order and compare objects, identifying and describing outcomes of chance experiments, interpreting maps and communicating positions
Problem solving	formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns
Reasoning	using generalising from number properties and results of calculations, comparing angles, creating and interpreting variations in the results of data collections and data displays

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Investigate the conditions required for a number to be odd or even and identify odd and even numbers (ACMNA051) • Recognise, model, represent and order numbers to at least 10 000 (ACMNA052) • Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems (ACMNA053) • Recognise and explain the connection between addition and subtraction (ACMNA054) • Recall addition facts for single-digit numbers and related subtraction facts to develop increasingly efficient mental strategies for computation (ACMNA055) • Recall multiplication facts of two, three, five and ten and related division facts (ACMNA056) • Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies (ACMNA057)
	Fractions and decimals	• Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole (ACMNA058)
	Real numbers	
	Money and financial mathematics	• Represent money values in multiple ways and count the change required for simple transactions to the nearest five cents (ACMNA059)
	Patterns and algebra	• Describe, continue, and create number patterns resulting from performing addition or subtraction (ACMNA060)
	Linear and non-linear relationships	
Measurement and geometry	**Using units of measurement**	• Measure, order and compare objects using familiar metric units of length, mass and capacity (ACMMG061) • Tell time to the minute and investigate the relationship between units of time (ACMMG062)
	Shape	• Make models of three-dimensional objects and describe key features (ACMMG063)
	Geometric reasoning	• Identify angles as measures of turn and compare angle sizes in everyday situations (ACMMG064)
	Location and transformation	• Create and interpret simple grid maps to show position and pathways (ACMMG065) • Identify symmetry in the environment (ACMMG066)
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Conduct chance experiments, identify and describe possible outcomes and recognise variation in results (ACMSP067)
	Data representation and interpretation	• Identify questions or issues for categorical variables. Identify data sources and plan methods of data collection and recording (ACMSP068) • Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (ACMSP069) • Interpret and compare data displays (ACMSP070)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction.

Measurement and geometry

Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects.

Statistics and probability

They interpret and compare data displays. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Australian Curriculum: Mathematics - (Year 4)

Proficiencies	Examples in this year
Understanding	making connections between representations of numbers, partitioning and combining numbers flexibly, extending place value to decimals, using appropriate language to communicate times, using informal units for comparing, and describing properties of symmetrical shapes
Fluency	recalling multiplication tables, communicating sequences of simple fractions, using instruments to measure accurately, creating patterns with shapes and their transformations, and collecting and recording data
Problem solving	formulating, modelling and recording authentic situations involving operations, comparing large numbers and time durations, and using properties of numbers to continue patterns
Reasoning	using generalising from number properties and results of calculations, deriving strategies for unfamiliar multiplication and division tasks, comparing angles, communicating information using graphical displays and evaluating the appropriateness of different displays

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Investigate and use the properties of odd and even numbers (ACMNA071) • Recognise, represent and order numbers to at least tens of thousands (ACMNA072) • Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems (ACMNA073) • Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9 (ACMNA074) • Recall multiplication facts up to 10 × 10 and related division facts (ACMNA075) • Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder (ACMNA076)
	Fractions and decimals	• Investigate equivalent fractions used in contexts (ACMNA077) • Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a number line (ACMNA078) • Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation (ACMNA079)
	Real numbers	
	Money and financial mathematics	• Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies (ACMNA080)
	Patterns and algebra	• Explore and describe number patterns resulting from performing multiplication (ACMNA081) • Solve word problems by using number sentences involving multiplication or division where there is no remainder (ACMNA082) • Use equivalent number sentences involving addition and subtraction to find unknown quantities (ACMNA083)
	Linear and non-linear relationships	
Measurement and geometry	**Using units of measurement**	• Use scaled instruments to measure and compare lengths, masses, capacities and temperatures (ACMMG084) • Compare objects using familiar metric units of area and volume (ACMMG290) • Convert between units of time (ACMMG085) • Use am and pm notation and solve simple time problem (ACMMG086)
	Shape	• Compare the areas of regular and irregular shapes by informal means (ACMMG087) • Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies (ACMMG088)
	Geometric reasoning	• Compare angles and classify them as equal to, greater than or less than a right angle (ACMMG089)
	Location and transformation	• Use simple scales, legends and directions to interpret information contained in basic maps (ACMMG090) • Create symmetrical patterns, pictures and shapes with and without digital technologies (ACMMG091)
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Describe possible everyday events and order their chances of occurring (ACMSP092) • Identify everyday events where one cannot happen if the other happens (ACMSP093) • Identify events where the chance of one will not be affected by the occurrence of the other (ACMSP094)
	Data representation and interpretation	• Select and trial methods for data collection, including survey questions and recording sheets (ACMSP095) • Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (ACMSP096) • Evaluate the effectiveness of different displays in illustrating data features including variability (ACMSP097)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 4, students choose appropriate strategies for calculations involving multiplication and division. They recognise common equivalent fractions in familiar contexts and make connections between fraction and decimal notations up to two decimal places. Students solve simple purchasing problems. They identify unknown quantities in number sentences. They describe number patterns resulting from multiplication. Students use the properties of odd and even numbers. They recall multiplication facts to 10 x 10 and related division facts. Students locate familiar fractions on a number line. They continue number sequences involving multiples of single digit numbers. Students use scaled instruments to measure temperatures, lengths, shapes and objects. They convert between units of time.

Measurement and geometry

Students compare areas of regular and irregular shapes using informal units. They solve problems involving time duration. They interpret information contained in maps. Students create symmetrical shapes and patterns. They classify angles in relation to a right angle.

Statistics and probability

Students identify dependent and independent events. They describe different methods for data collection and representation, and evaluate their effectiveness. Students list the probabilities of everyday events. They construct data displays from given or collected data.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials (v5.0 May 2013)

Australian Curriculum: Mathematics - (Year 5)

	Proficiencies	Examples in this year
	Understanding	making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways
	Fluency	choosing appropriate units of measurement for calculation of perimeter and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles
	Problem solving	formulating and solving authentic problems using numbers and measurements, creating transformations and identifying line and rotational symmetries
	Reasoning	investigating strategies to perform calculations efficiently, creating financial plans, interpreting results of chance experiments and interpreting data sets

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Identify and describe factors and multiples of whole numbers and use them to solve problems (ACMNA098) • Use estimation and rounding to check the reasonableness of answers to calculations (ACMNA099) • Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies (ACMNA100) • Solve problems involving division by a one digit number, including those that result in a remainder (ACMNA101) • Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (ACMNA291)
	Fractions and decimals	• Compare and order common unit fractions and locate and represent them on a number line (ACMNA291) • Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator (ACMNA103) • Recognise that the system can be extended beyond hundredths (ACMNA104) • Compare, order and represent decimals (ACMNA105)
	Real numbers	
	Money and financial mathematics	• Create simple financial plans (ACMNA106)
	Patterns and algebra	• Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (ACMNA107) • Use equivalent number sentences involving multiplication and division to find unknown quantities (ACMNA121)
	Linear and non-linear relationships	
Measurement and geometry	**Using units of measurement**	• Choose appropriate units of measurement for length, area, volume, capacity and mass (ACMMG108) • Calculate the perimeter and area of rectangles using familiar metric units (ACMMG109) • Compare 12- and 24-hour time systems and convert between them (ACMMG110)
	Shape	• Connect three-dimensional objects with their nets and other two-dimensional representations (ACMMG111)
	Geometric reasoning	• Estimate, measure and compare angles using degrees. Construct angles using a protractor (ACMMG112)
	Location and transformation	• Use a grid reference system to describe locations. Describe routes using landmarks and directional language (ACMMG113) • Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries (ACMMG114) • Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original (ACMMG115)
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions (ACMSP116) • Recognise that probabilities range from 0 to 1 (ACMSP117)
	Data representation and interpretation	• Pose questions and collect categorical or numerical data by observation or survey (ACMSP118) • Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (ACMSP119) • Describe and interpret different data sets in context (ACMSP120)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 5, students solve simple problems involving the four operations using a range of strategies. They check the reasonableness of answers using estimation and rounding. Students identify and describe factors and multiples. They explain plans for simple budgets. Students order decimals and unit fractions and locate them on number lines. They add and subtract fractions with the same denominator. Students continue patterns by adding and subtracting fractions and decimals. They find unknown quantities in number sentences. They use appropriate units of measurement for length, area, volume, capacity and mass, and calculate perimeter and area of rectangles. They convert between 12 and 24 hour time.

Measurement and geometry

Students connect three-dimensional objects with their two-dimensional representations. They describe transformations of two-dimensional shapes and identify line and rotational symmetry. Students use a grid reference system to locate landmarks. They measure and construct different angles.

Statistics and probability

Students compare and interpret different data sets. Students list outcomes of chance experiments with equally likely outcomes and assign probabilities between 0 and 1. Students pose questions to gather data, and construct data displays appropriate for the data.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Australian Curriculum: Mathematics - (Year 6)

	Proficiencies	Examples in this year
	Understanding	describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations
	Fluency	includes representing integers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units, and interpreting timetables
	Problem solving	includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays, and finding the size of unknown angles
	Reasoning	explaining mental strategies for performing calculations, describing results for continuing number sequences, investigating new situations using known properties of angles, explaining the transformation of one shape into another, and inferring from the results of experiments

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Identify and describe properties of prime, composite, square and triangular numbers (ACMNA122) • Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123) • Investigate everyday situations that use integers. Locate and represent these numbers on a number line (ACMNA124)
	Fractions and decimals	• Compare fractions with related denominators and locate and represent them on a number line (ACMNA125) • Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA126) • Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies (ACMNA127) • Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers (ACMNA128) • Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies (ACMNA129) • Multiply and divide decimals by powers of 10 (ACMNA130) • Make connections between equivalent fractions, decimals and percentages (ACMNA131)
	Real numbers	
	Money and financial mathematics	• Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies (ACMNA132)
	Patterns and algebra	• Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence (ACMNA133) • Explore the use of brackets and order of operations to write number sentences (ACMNA134)
	Linear and non-linear relationships	
Measurement and geometry	**Using units of measurement**	• Connect decimal representations to the metric system (ACMMG135) • Convert between common metric units of length, mass and capacity (ACMMG136) • Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137) • Connect volume and capacity and their units of measurement (ACMMG138) • Interpret and use timetables (ACMMG139)
	Shape	• Construct simple prisms and pyramids (ACMMG140)
	Geometric reasoning	• Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles (ACMMG141)
	Location and transformation	• Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies (ACMMG142) • Introduce the Cartesian coordinate system using all four quadrants (ACMMG143)
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Describe probabilities using fractions, decimals and percentages (ACMSP144) • Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies (ACMSP145) • Compare observed frequencies across experiments with expected frequencies (ACMSP146)
	Data representation and interpretation	• Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables (ACMSP147) • Interpret secondary data presented in digital media and elsewhere (ACMSP148)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They describe rules used in sequences involving whole numbers, fractions and decimals. Students locate fractions and integers on a number line. They calculate a simple fraction of a quantity. They add, subtract and multiply decimals and divide decimals where the result is rational. Students calculate common percentage discounts on sale items. They write correct number sentences using brackets and order of operations.

Measurement and geometry

Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. Students describe combinations of transformations. They solve problems using the properties of angles. They make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. They construct simple prisms and pyramids. Students locate an ordered pair in any one of the four quadrants on the Cartesian plane.

Statistics and probability

Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They evaluate secondary data displayed in the media. Students list and communicate probabilities using simple fractions, decimals and percentages.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials (v5.0 May 2013)

Australian Curriculum: Mathematics - (Year 7)

Proficiencies		Examples in this year
	Understanding	describing patterns in uses of indices with whole numbers, recognising commonalities between fractions, decimals, percentages and ratios, plotting points on the Cartesian plane, identifying angles formed by a transversal crossing a pair of parallel lines, and connecting the laws and properties of numbers to algebraic terms and expressions
	Fluency	calculating accurately with integers, representing fractions and decimals in various ways, investigating best buys, evaluating measures of central tendency and calculating areas of shapes and volumes of prisms
	Problem solving	formulating and solving authentic problems using numbers and measurements, creating transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments
	Reasoning	applying the number laws to calculations, applying known geometric facts to draw conclusions about shapes, applying an understanding of ratio and interpreting data displays

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Investigate index notation and represent whole numbers as products of powers of prime numbers (ACMNA149) • Investigate and use square roots of perfect square numbers (ACMNA150) • Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151) • Compare, order, add and subtract integers (ACMNA280)
	Fractions and decimals	
	Real numbers	• Compare fractions with related denominators and locate and represent them on a number line (ACMNA152) • Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA153) • Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154) • Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155) • Round decimals to a specified number of decimal places (ACMNA156) • Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157) • Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies (ACMNA158) • Recognise and solve problems involving simple ratios (ACMNA173)
	Money and financial mathematics	• Investigate and calculate 'best buys', with and without digital technologies (ACMNA174)
	Patterns and algebra	• Introduce the concept of variables as a way of representing numbers using letters (ACMNA175) • Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176) • Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)
	Linear and non-linear relationships	• Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point (ACMNA178) • Solve simple linear equations (ACMNA179) • Investigate, interpret and analyse graphs from authentic data (ACMNA180)
Measurement and geometry	**Using units of measurement**	• Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (ACMMG159) • Calculate volumes of rectangular prism (ACMMG160)
	Shape	• Draw different views of prisms and solids formed from combinations of prisms (ACMMG161)
	Geometric reasoning	• Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165) • Demonstrate that the angle sum of a triangle is 180° and use this to find the angle sum of a quadrilateral (ACMMG166) • Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (ACMMG163) • Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning (ACMMG164)
	Location and transformation	• Describe translations, reflections in an axis, and rotations of multiples of 90° on the Cartesian plane using coordinates. Identify line and rotational symmetries
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Construct sample spaces for single-step experiments with equally likely outcomes (ACMSP167) • Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)
	Data representation and interpretation	• Identify and investigate issues involving continuous or large count data collected from primary and secondary sources (ACMSP169) • Construct and compare a range of data displays including stem-and-leaf plots and dot plots (ACMSP170) • Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171) • Describe and interpret data displays using median, mean and range (ACMSP172)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution.

Measurement and geometry

Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line.

Statistics and probability

Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials (v5.0 May 2013)

Australian Curriculum: Mathematics - (Year 8)

Proficiencies	Examples in this year
Understanding	describing patterns in uses of indices and repeating decimals, identifying commonalities between operations with algebra and arithmetic, connecting rules of relations and functions and their graphs, explaining the function of statistical measures, and contrasting measurements of perimeter and area
Fluency	calculating accurately with simple decimals, indices and integers, recognising equivalence of common decimals and fractions including repeating decimals, factorising and simplifying basic algebraic expressions, evaluating perimeters, areas and volumes of common shapes, and calculating the mean and median of small sets of data
Problem solving	formulating and modelling, with comparisons of ratios, profit and loss, authentic situations involving areas and perimeters of common shapes and analysing and interpreting data using two-way tables
Reasoning	justifying the result of a calculation or estimation as reasonable, explaining formal and intuitive use of ratios for comparing rates and prices, deriving one probability from its complement, using congruence to deduce properties of triangles, and making inferences about data

	Sub-strands	Content Descriptions
Number and Algebra	**Number and place value**	• Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182) • Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)
	Fractions and decimals	
	Real numbers	• Investigate terminating and recurring decimals (ACMNA184) • Investigate the concept of irrational numbers, including π (ACMNA186) • Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies (ACMNA187) • Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)
	Money and financial mathematics	• Solve problems involving profit and loss, with and without digital technologies (ACMNA189)
	Patterns and algebra	• Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190) • Factorise algebraic expressions by identifying numerical factors (ACMNA191) • Simplify algebraic expressions involving the four operations (ACMNA192)
	Linear and non-linear relationships	• Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193) • Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)
Measurement and geometry	**Using units of measurement**	• Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195) • Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196) • Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197) • Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198) • Solve problems involving duration, including using 12- and 24-hour time within a single time zone (ACMMG199)
	Shape	
	Geometric reasoning	• Define congruence of plane shapes using transformations (ACMMG200) • Develop the conditions for congruence of triangles (ACMMG201) • Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202)
	Location and transformation	
	Pythagoras and trigonometry	
Statistics and probability	**Chance**	• Identify complementary events and use the sum of probabilities to solve problems (ACMSP204) • Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and' (ACMSP205) • Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)
	Data representation and interpretation	• Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206) • Explore the variation of means and proportions in random samples drawn from the same population (ACMSP293) • Investigate the effect of individual data values , including outliers, on the mean and median (ACMSP207) • Investigate techniques for collecting data, including census and sampling and observation (ACMSP284)

Achievement Standard
(organised by Strands)

Number and Algebra

By the end of Year 8, students solve everyday problems involving rates, ratios and percentages. They recognise index laws and apply them to whole numbers. They describe rational and irrational numbers. Students solve problems involving profit and loss. They make connections between expanding and factorising algebraic expressions. Students use efficient mental and written strategies to carry out the four operations with integers. They simplify a variety of algebraic expressions. They solve linear equations and graph linear relationships on the Cartesian plane.

Measurement and geometry

Students solve problems relating to the volume of prisms. They make sense of time duration in real applications. They identify conditions for the congruence of triangles and deduce the properties of quadrilaterals. Students convert between units of measurement for area and volume. They perform calculations to determine perimeter and area of parallelograms, rhombuses and kites. They name the features of circles and calculate the areas and circumferences of circles. Students determine complementary events and calculate the sum of probabilities.

Statistics and probability

Students model authentic situations with two-way tables and Venn diagrams. They choose appropriate language to describe events and experiments. They explain issues related to the collection of data and the effect of outliers on means and medians in that data. Students determine complementary events and calculate the sum of probabilities.

General Capabilities
- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities
- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Based on Australian Curriculum, Assessment and Reporting Authority (ACARA) materials (v5.0 May 2013)

Australian Curriculum: Mathematics - (Year 9)

	Proficiencies	Examples in this year	Achievement Standard *(organised by Strands)*
	Understanding	describing the relationship between graphs and equations, simplifying a range of algebraic expressions, explaining the function of relative frequencies and probabilities, calculating areas of shapes and surface areas of prisms and the constancy of the trigonometric ratios for right-angle triangles	Number and Algebra By the end of Year 9, students solve problems involving simple interest. Students apply the index laws to numbers and express numbers in scientific notation. They expand binomial expressions. They find the distance between two points on the Cartesian plane and the gradient and midpoint of a line segment. They sketch linear and non-linear relations. Measurement and geometry They interpret ratio and scale factors in similar figures. Students explain similarity of triangles. They recognise the connections between similarity and the trigonometric ratios. Students calculate areas of shapes and the volume and surface area of right prisms and cylinders. They use Pythagoras' Theorem and trigonometry to find unknown sides of right-angled triangles. Statistics and probability Students compare techniques for collecting data in primary and secondary sources. They make sense of the position of the mean and median in skewed, symmetric and bi-modal displays to describe and interpret data. Students calculate relative frequencies to estimate probabilities, list outcomes for two-step experiments and assign probabilities for those outcomes. They construct histograms and back-to-back stem-and-leaf plots.
	Fluency	applying the index laws to expressions with integer indices, expressing numbers in scientific notation, listing outcomes for experiments and developing familiarity with calculations involving the Cartesian plane	
	Problem solving	calculating 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	following mathematical arguments, evaluating media reports and using statistical knowledge to draw conclusions, developing strategies in investigating similarity and sketching linear graphs	
	Sub-strands	**Content Descriptions**	
Number and Algebra	**Number and place value**		
	Fractions and decimals		
	Real numbers	• Solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems (ACMNA208) • Apply index laws to numerical expressions with integer indices (ACMNA209) • Express numbers in scientific notation (ACMNA210)	
	Money and financial mathematics	• Solve problems involving simple interest (ACMNA211)	
	Patterns and algebra	• Extend and apply the index laws to variables, using positive integer indices and the zero index (ACMNA212) • Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (ACMNA213)	
	Linear and non-linear relationships	• Find the distance between two points located on a Cartesian plane using a range of strategies, including graphing software (ACMNA214) • Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software (ACMNA294) • Sketch linear graphs using the coordinates of two points and solve linear equations (ACMNA215) • Graph simple non-linear relations with and without the use of digital technologies and solve simple related equations (ACMNA296)	
Measurement and geometry	**Using units of measurement**	• Calculate the areas of composite shapes (ACMMG216) • Calculate the surface area and volume of cylinders and solve related problems (ACMMG217) • Solve problems involving the surface area and volume of right prisms (ACMMG218) • Investigate very small and very large time scales and interval (ACMMG219)	
	Shape		
	Geometric reasoning	• Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar (ACMMG220) • Solve problems using ratio and scale factors in similar figures (ACMMG221)	
	Location and transformation		
	Pythagoras and trigonometry	• Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles (ACMMG222) • Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles (ACMMG223) • Apply trigonometry to solve right-angled triangle problems (ACMMG224)	
Statistics and probability	**Chance**	• List all outcomes for two-step chance experiments, both with and without replacement using tree diagrams or arrays. Assign probabilities to outcomes and determine probabilities for events (ACMSP225) • Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or' (ACMSP226) • Investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians (ACMSP227)	
	Data representation and interpretation	• Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly from secondary sources (ACMSP228) • Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal' (ACMSP282) • Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (ACMSP283)	

General Capabilities

- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

Australian Curriculum: Mathematics - (Year 10)

	Proficiencies	Examples in this year	Achievement Standard *(organised by Strands)*
	Understanding	describing patterns in uses of indices, applying the four operations to algebraic fractions, finding unknowns in formulas after substitution, making the connection between algebraic and graphical representations of relations, connecting simple and compound interest in financial contexts and determining probabilities of multiple experiments	Number and Algebra By the end of Year 10, students recognise the connection between simple and compound interest. They solve problems involving linear equations and inequalities. They make the connections between algebraic and graphical representations of relations. Students expand binomial expressions and factorise monic quadratic expressions. They find unknown values after substitution into formulas. They perform the four operations with simple algebraic fractions. Students solve simple quadratic equations and pairs of simultaneous equations. Measurement and geometry Students solve surface area and volume problems relating to composite solids. They recognise the relationships between parallel and perpendicular lines. Students apply deductive reasoning to proofs and numerical exercises involving plane shapes. They use triangle and angle properties to prove congruence and similarity. Students use trigonometry to calculate unknown angles in right-angled triangles. Statistics and probability They compare data sets by referring to the shapes of the various data displays. They describe bivariate data where the independent variable is time. Students describe statistical relationships between two continuous variables. They evaluate statistical reports. Students list outcomes for multi-step chance experiments and assign probabilities for these experiments. They calculate quartiles and inter-quartile ranges.
	Fluency	formulating proofs using congruent triangles and angle properties, 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	calculating the surface area and volume of a diverse range of prisms, 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 and their probabilities	
	Reasoning	formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets	

	Sub-strands	Content Descriptions 10	Content Descriptions 10A
Number and Algebra	**Number and place value**		
	Fractions and decimals		
	Real numbers		• Define rational and irrational numbers and perform operations with surds and fractional indices (ACMNA264) • Use the definition of a logarithm to establish and apply the laws of logarithms (ACMNA265)
	Money and financial mathematics	• Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies (ACMNA229)	
	Patterns and algebra	• Factorise algebraic expressions by taking out a common algebraic factor (ACMNA230) • Simplify algebraic products and quotients using index laws (ACMNA231) • Apply the four operations to simple algebraic fractions with numerical denominators (ACMNA232) • Expand binomial products and factorise monic quadratic expressions using a variety of strategies (ACMNA233) • Substitute values into formulas to determine an unknown (ACMNA234)	• Investigate the concept of a polynomial and apply the factor and remainder theorems to solve problems (ACMNA266)
	Linear and non-linear relationships	• Solve problems involving linear equations, including those derived from formulas (ACMNA235) • Solve linear inequalities and graph their solutions on a number line (ACMNA236) • Solve linear simultaneous equations, using algebraic and graphical techniques including using digital technology (ACMNA237) • Solve problems involving parallel and perpendicular lines (ACMNA238) • Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239) • Solve linear equations involving simple algebraic fractions (ACMNA240) • Solve simple quadratic equations using a range of strategies (ACMNA241)	• Describe, interpret and sketch parabolas, hyperbolas, circles and exponential functions and their transformations (ACMNA267) • Solve simple exponential equations (ACMNA270) • Apply understanding of polynomials to sketch a range of curves and describe the features of these curves from their equation (ACMNA268) • Factorise monic and non-monic quadratic expressions and solve a wide range of quadratic equations derived from a variety of contexts (ACMNA269)
Measurement and geometry	**Using units of measurement**	• Solve problems involving surface area and volume for a range of prisms, cylinders and composite solid (ACMMG242)	• Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids (ACMMG271)
	Shape		
	Geometric reasoning	• Formulate proofs involving congruent triangles and angle properties (ACMMG243) • Apply logical reasoning, including the use of congruence and similarity, to proofs and numerical exercises involving plane shapes (ACMMG244)	• Prove and apply angle and chord properties of circles (ACMMG272)
	Location and transformation		
	Pythagoras and trigonometry	• Solve right-angled triangle problems including those involving direction and angles of elevation and depression (ACMMG245)	• Establish the sine, cosine and area rules for any triangle and solve related problems (ACMMG273) • Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies (ACMMG274) • Solve simple trigonometric equations (ACMMG275) • Apply Pythagoras' theorem and trigonometry to solving three-dimensional problems in right-angled triangles (ACMMG276)
Statistics and probability	**Chance**	• Describe the results of two- and three-step chance experiments, both with and without replacements, assign probabilities to outcomes and determine probabilities of events. Investigate the concept of independence (ACMSP246) • Use the language of 'if ....then, 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (ACMSP247)	• Investigate reports of studies in digital media and elsewhere for information on their planning and implementation (ACMSP277)
	Data representation and interpretation	• Determine quartiles and interquartile range (ACMSP248) • Construct and interpret box plots and use them to compare data sets (ACMSP249) • Compare shapes of box plots to corresponding histograms and dot plots (ACMSP250) • Use scatter plots to investigate and comment on relationships between two numerical variables (ACMSP251) • Investigate and describe bivariate numerical data where the independent variable is time (ACMSP252) • Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (ACMSP253)	• Calculate and interpret the mean and standard deviation of data and use these to compare data sets (ACMSP278) • Use information technologies to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation (ACMSP279)

General Capabilities
- Literacy
- Numeracy
- Information and communication technology (ICT) capability
- Critical and creative thinking
- Ethical behaviour
- Personal and social capability
- Intercultural understanding

Cross-Curriculum Priorities
- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Notes:

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