



# Scope & Sequence Overview - Stage 3, Year 6



## Whole Number 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- orders, reads and represents integers of any size and describes properties of whole numbers - MA3-4NA

### Vocabulary

ascending order, descending order, zero, ones, tens, hundreds, thousands, tens of thousands, hundreds of thousands, millions, digit, place value, expanded notation, round to, whole number, factor, highest common factor (HCF), multiple, lowest common multiple (LCM), number line, whole number, positive number, negative number, integer, prime number, composite number, factor, square number, triangular number.

	T1	T2	T3	T4
<b>Recognise, represent and order numbers to at least tens of millions</b>				
• apply an understanding of place value and the role of zero to read and write numbers of any size				
• state the place value of digits in numbers of any size				
• arrange numbers of any size in ascending and descending order				
• record numbers of any size using expanded notation, e.g. $1\ 63\ 480 = 100\ 000 + 60\ 000 + 3000 + 400 + 80$				
• partition numbers of any size in non-standard forms to aid mental calculation, e.g. when adding 163 480 and 150 000, 163 480 could be partitioned as $150\ 000 + 13\ 480$ , so that 150 000 could then be doubled and added to 13 480				
• use numbers of any size in real-life situations, including in money problems				
• recognise different abbreviations of numbers used in everyday contexts, e.g. \$350 K represents \$350 000				MR
• round numbers to a specified place value, e.g. round 5 461 883 to the nearest million				
<b>Identify and describe factors and multiples of whole numbers and use them to solve problems</b>				
• determine the 'highest common factor' (HCF) of two whole numbers, e.g. the HCF of 16 and 24 is 8				
• determine the 'lowest common multiple' (LCM) of two whole numbers, e.g. the LCM of 21 and 63 is 63				
• solve problems using knowledge of factors and multiples, e.g. 'There are 48 people at a party. In how many ways can you set up the tables and chairs, so that each table seats the same number of people and there are no empty chairs?'				

## Whole Number 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- orders, reads and represents integers of any size and describes properties of whole numbers - MA3-4NA

### Vocabulary

ascending order, descending order, zero, ones, tens, hundreds, thousands, tens of thousands, hundreds of thousands, millions, digit, place value, expanded notation, round to, whole number, factor, highest common factor (HCF), multiple, lowest common multiple (LCM), number line, whole number, positive number, negative number, integer, prime number, composite number, factor, square number, triangular number.

	T1	T2	T3	T4
<b>Investigate everyday situations that use integers; locate and represent these numbers on a number line</b>				
• recognise the location of negative whole numbers in relation to zero and place them on a number line	MR		MR	
• use the term 'integers' to describe positive and negative whole numbers and zero				
• interpret integers in everyday contexts, e.g. temperature				
• investigate negative whole numbers and the number patterns created when counting backwards on a calculator				
<b>Identify and describe properties of prime, composite, square and triangular numbers</b>				
• determine whether a number is prime, composite or neither			MR	MR
• model square and triangular numbers and record each number group in numerical and diagrammatic form			MR	MR

## Addition & Subtraction 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and applies appropriate strategies for addition and subtraction with counting numbers of any size - MA3-5NA

### Vocabulary

plus, sum, add, addition, increase, minus, the difference between, subtract, subtraction, decrease, equals, is equal to, empty number line, strategy, digit, estimate, round to, budget, operation.

T1 T2 T3 T4

### Create simple financial plans

use knowledge of addition and subtraction facts to create a financial plan, such as a budget, e.g. organise a class celebration on a budget of \$60 for all expenses				
explain how financial transactions can include using more than notes and coins				
describe how an individual can influence their income				
recognise that families use household income to meet regular financial commitments and immediate and future expenses				
analyse the value of a range of goods and services in relation to an identified need				
explain how money can be borrowed to meet needs and wants and that there may be a cost involved				
use a range of methods and tools to keep financial records in 'real life' contexts				
create simple budgets for a range of purposes and explain the benefits of saving for future needs and wants				
accurately complete and explain the purpose of financial forms, including for online transactions				
evolute the value of a range of goods and services in a variety of 'real life' situations				
order and justify reasons for spending preferences				
discuss various payment options for purchasing goods and services such as: cash, debit card, credit card, direct debit and PayPal				
interpret information from a variety of invoice accounts including information presented graphically, such as electricity accounts				

## Addition & Subtraction 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and applies appropriate strategies for addition and subtraction with counting numbers of any size - MA3-5NA

### Vocabulary

plus, sum, add, addition, increase, minus, the difference between, subtract, subtraction, decrease, equals, is equal to, empty number line, strategy, digit, estimate, round to, budget, operation.

T1 T2 T3 T4

### Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving addition and subtraction with whole numbers

solve addition and subtraction word problems involving whole numbers of any size, including problems that require more than one operation, e.g. 'I have saved \$40 000 to buy a new car. The basic model costs \$36 118 and I add tinted windows for \$860 and Bluetooth connectivity for \$1376. How much money will I have left over?'				
record the strategy used to solve addition and subtraction word problems				

## Multiplication & Division 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and applies appropriate strategies for multiplication and division, and applies the order of operations to calculations involving more than one operation - MA3-6NA

### Vocabulary

multiply, multiplied by, product, multiplication, multiplication facts, area, thousands, hundreds, tens, ones, double, multiple, factor, divide, divided by, quotient, division, halve, remainder, fraction, decimal, equals, strategy, digit, estimate, round to, speed, per, operations, order of operations, grouping symbols, brackets, number sentence, is the same as.

	T1	T2	T3	T4
<b>Solve problems involving division by a one-digit number, including those that result in a remainder</b>				
<ul style="list-style-type: none"> <li>record remainders as fractions and decimals, e.g. <math>25 \div 4 = 6\frac{1}{4}</math> or 6.25</li> </ul>				
<ul style="list-style-type: none"> <li>use mental and written strategies to divide a number with three or more digits by a one-digit divisor where there is a remainder, including:               <ul style="list-style-type: none"> <li>dividing the tens, and then the ones (split strategy)</li> <li>using the formal algorithm</li> </ul> </li> </ul>				

## Multiplication & Division 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and applies appropriate strategies for multiplication and division, and applies the order of operations to calculations involving more than one operation - MA3-6NA

### Vocabulary

multiply, multiplied by, product, multiplication, multiplication facts, area, thousands, hundreds, tens, ones, double, multiple, factor, divide, divided by, quotient, division, halve, remainder, fraction, decimal, equals, strategy, digit, estimate, round to, speed, per, operations, order of operations, grouping symbols, brackets, number sentence, is the same as.

	T1	T2	T3	T4
<b>Select and apply efficient mental and written strategies, and appropriate digital technologies, to solve problems involving multiplication and division with whole numbers</b>				
<ul style="list-style-type: none"> <li>select and use efficient mental and written strategies, and digital technologies, to multiply whole numbers of up to four digits by one- and two-digit numbers</li> </ul>				
<ul style="list-style-type: none"> <li>select and use efficient mental and written strategies, and digital technologies, to divide whole numbers of up to four digits by a one-digit divisor, including where there is a remainder</li> </ul>				
<ul style="list-style-type: none"> <li>use mental strategies to multiply and divide numbers by 10, 100, 1000 and their multiples</li> </ul>	MR			
<ul style="list-style-type: none"> <li>solve word problems involving multiplication and division, e.g. 'A recipe requires 3 cups of flour for 10 people. How many cups of flour are required for 40 people?'</li> </ul>				
<ul style="list-style-type: none"> <li>recognise symbols used to record speed in kilometres per hour, e.g. 80 km/h</li> </ul>				
<ul style="list-style-type: none"> <li>solve simple problems involving speed, e.g. 'How long would it take to travel 600 km if the average speed for the trip is 75 km/h?'</li> </ul>				
<b>Explore the use of brackets and the order of operations to write number sentences</b>				
<ul style="list-style-type: none"> <li>use the term 'operations' to describe collectively the processes of addition, subtraction, multiplication and division</li> </ul>				
<ul style="list-style-type: none"> <li>investigate and establish the order of operations using real-life contexts, e.g. 'I buy six goldfish costing \$10 each and two water plants costing \$4 each. What is the total cost?'; this can be represented by the number sentence <math>6 \times 10 + 2 \times 4</math> but, to obtain the total cost, multiplication must be performed before addition</li> </ul>				
<ul style="list-style-type: none"> <li>recognise that the grouping symbols <math>()</math> and <math>[\ ]</math> are used in number sentences to indicate operations that must be performed first</li> </ul>				
<ul style="list-style-type: none"> <li>recognise that if more than one pair of grouping symbols are used, the operation within the innermost grouping symbols is performed first</li> </ul>				
<ul style="list-style-type: none"> <li>perform calculations involving grouping symbols without the use of digital technologies</li> </ul>				
<ul style="list-style-type: none"> <li>apply the order of operations to perform calculations involving mixed operations and grouping symbols, without the use of digital technologies</li> </ul>				
<ul style="list-style-type: none"> <li>recognise when grouping symbols are not necessary, e.g. <math>32 + (2 \times 4)</math> has the same answer as <math>32 + 2 \times 4</math></li> </ul>				

## Fractions & Decimals 2

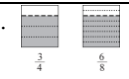
### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- compares, orders and calculates with fractions, decimals and percentages - MA3-7NA

### Vocabulary

whole, equal parts, half, quarter, eighth, third, sixth, twelfth, fifth, tenth, hundredth, thousandth, one-thousandth, fraction, numerator, denominator, mixed numeral, whole number, number line, proper fraction, improper fraction, decimal, decimal point, digit, place value, decimal places, equivalent, ascending order, descending order, simplest form, best buy, percent, percentage, discount, sale price, is equal to, equivalent, ascending order, descending order, simplest form, round to, dollars, cents.

	T1	T2	T3	T4
<b>Compare fractions with related denominators and locate and represent them on a number line</b>				

<ul style="list-style-type: none"> <li>compare and order simple fractions with related denominators using strategies such as diagrams, the number line, or equivalent fractions, e.g. write <math>\frac{3}{5}</math>, <math>\frac{3}{10}</math>, <math>1\frac{1}{10}</math>, <math>\frac{4}{5}</math> and <math>\frac{7}{10}</math> in ascending order</li> </ul>				
<ul style="list-style-type: none"> <li>find equivalent fractions by re-dividing the whole, using diagrams and number lines, e.g. </li> </ul>				
<ul style="list-style-type: none"> <li>record equivalent fractions using diagrams and numerals</li> </ul>				
<ul style="list-style-type: none"> <li>develop mental strategies for generating equivalent fractions, such as multiplying or dividing the numerator and the denominator by the same number, e.g. <math>\frac{1}{4} = \frac{1 \times 2}{4 \times 2} = \frac{2}{8} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12} = \frac{1 \times 4}{4 \times 4} = \frac{4}{16} = \dots</math> i.e. <math>\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \dots</math></li> </ul>				
<ul style="list-style-type: none"> <li>write fractions in their 'simplest form' by dividing the numerator and the denominator by a common factor, e.g. <math>\frac{4}{16} = \frac{4 \div 4}{16 \div 4} = \frac{1}{4}</math></li> </ul>				
<b>Solve problems involving addition and subtraction of fractions with the same or related denominators</b>				
<ul style="list-style-type: none"> <li>add and subtract fractions, including mixed numerals, where one denominator is the same as, or a multiple of, the other, e.g. <math>\frac{2}{3} + \frac{1}{6}</math>, <math>2\frac{3}{8} - 1\frac{1}{2}</math>, <math>2\frac{3}{8} - \frac{3}{4}</math></li> </ul>				
<ul style="list-style-type: none"> <li>solve word problems involving the addition and subtraction of fractions where one denominator is the same as, or a multiple of, the other, e.g. 'I ate <math>\frac{1}{8}</math> of a cake and my friend ate <math>\frac{1}{4}</math> of the cake. What fraction of the cake remains?'</li> </ul>				
<ul style="list-style-type: none"> <li>multiply simple fractions by whole numbers using repeated addition, leading to a rule, e.g. <math>\frac{2}{5} \times 3 = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5} = 1\frac{1}{5}</math> leading to <math>\frac{2}{5} \times 3 = \frac{2 \times 3}{5} = \frac{6}{5} = 1\frac{1}{5}</math></li> </ul>				
<b>Find a simple fraction of a quantity where the result is a whole number, with and without the use of digital technologies</b>				
<ul style="list-style-type: none"> <li>calculate unit fractions of collections, with and without the use of digital technologies, e.g. calculate <math>\frac{1}{5}</math> of 30</li> </ul>				
<ul style="list-style-type: none"> <li>calculate a simple fraction of a collection/quantity, with and without the use of digital technologies, e.g. calculate <math>\frac{2}{5}</math> of 30</li> </ul>				
<ul style="list-style-type: none"> <li>solve word problems involving a fraction of a collection/quantity</li> </ul>				
<b>Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without the use of digital technologies</b>				
<ul style="list-style-type: none"> <li>use mental strategies to multiply simple decimals by single-digit numbers, e.g. <math>3.5 \times 2</math></li> </ul>				
<ul style="list-style-type: none"> <li>multiply decimals of up to three decimal places by whole numbers of up to two digits, with and without the use of digital technologies, e.g. 'I measured three desks. Each desk was 1.25 m in length, so the total length is <math>3 \times 1.25 = 3.75</math> m'</li> </ul>				
<ul style="list-style-type: none"> <li>divide decimals by a one-digit whole number where the result is a terminating decimal, e.g. <math>5.25 \div 5 = 1.05</math></li> </ul>				
<ul style="list-style-type: none"> <li>solve word problems involving the multiplication and division of decimals, including those involving money, e.g. determine the 'best buy' for different-sized cartons of cans of soft drink</li> </ul>				
<b>Multiply and divide decimals by powers of 10</b>				
<ul style="list-style-type: none"> <li>recognise the number patterns formed when decimals are multiplied and divided by 10, 100 and 1000</li> </ul>	MR	MR		
<ul style="list-style-type: none"> <li>multiply and divide decimals by 10, 100 and 1000</li> </ul>	MR	MR		
<b>Make connections between equivalent fractions, decimals and percentages</b>				
<ul style="list-style-type: none"> <li>recognise that the symbol % means 'percent'</li> </ul>				MR
<ul style="list-style-type: none"> <li>represent common percentages as fractions and decimals, e.g. '25% means 25 out of 100 or <math>\frac{1}{4}</math> or 0.25'</li> </ul>				MR
<ul style="list-style-type: none"> <li>represent simple fractions as decimals and as percentages</li> </ul>				MR
<ul style="list-style-type: none"> <li>represent decimals as fractions and percentages, e.g. <math>1.37 = 137\% = \frac{137}{100} = 1\frac{37}{100}</math></li> </ul>				
<b>Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without the use of digital technologies</b>				
<ul style="list-style-type: none"> <li>equate 10% to <math>\frac{1}{10}</math>, 25% to <math>\frac{1}{4}</math> and 50% to <math>\frac{1}{2}</math></li> </ul>				
<ul style="list-style-type: none"> <li>calculate common percentages (10%, 25%, 50%) of quantities, with and without the use of digital technologies</li> </ul>				
<ul style="list-style-type: none"> <li>use mental strategies to estimate discounts of 10%, 25% and 50%, e.g. '50% off the price of \$122.70: 50% is the same as <math>\frac{1}{2}</math>, so the discount is about \$60'</li> </ul>				
<ul style="list-style-type: none"> <li>calculate the sale price of an item after a discount of 10%, 25% and 50%, with and without the use of digital technologies, recording the strategy and result</li> </ul>				

## Patterns & Algebra 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane - MA3-8NA

### Vocabulary

pattern, increase, decrease, missing number, number sentence, number line, value, table of values, rule, position in pattern, value of term, number plane (Cartesian plane), horizontal axis (x-axis), vertical axis (y-axis), axes, quadrant, intersect, point of intersection, right angles, origin, coordinates, point, plot, term.

T1 T2 T3 T4

### Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction

- create, with materials or digital technologies, a variety of patterns using whole numbers, fractions or decimals, e.g.  $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \dots$  or 2.2, 2.0, 1.8, 1.6, ...

- use a number line or other diagram to create patterns involving fractions or decimals

### Use equivalent number sentences involving multiplication and division to find unknown quantities

- complete number sentences involving multiplication and division, including those involving simple fractions or decimals,

## Patterns & Algebra 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane - MA3-8NA

### Vocabulary

pattern, increase, decrease, missing number, number sentence, number line, value, table of values, rule, position in pattern, value of term, number plane (Cartesian plane), horizontal axis (x-axis), vertical axis (y-axis), axes, quadrant, intersect, point of intersection, right angles, origin, coordinates, point, plot, term.

T1 T2 T3 T4

### Continue and create sequences involving whole numbers, fractions and decimals; describe the rule used to create the sequence

- continue and create number patterns, with and without the use of digital technologies, using whole numbers, fractions and decimals, e.g.  $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \dots$  or 1.25, 2.5, 5, ...

- complete a table of values for a geometric pattern and describe the pattern in words, e.g.

□ . □□ . □□□ . □□□□ . ...	<table border="1"> <tr> <td>number of squares</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>...</td> <td>100</td> </tr> <tr> <td>number of matches</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>...</td> <td></td> </tr> </table>	number of squares	1	2	3	4	...	100	number of matches	4	8	12	16	...	
number of squares	1	2	3	4	...	100									
number of matches	4	8	12	16	...										

- make generalisations about numbers and number relationships, e.g. 'If you add a number and then subtract the same number, the result is the number you started with'

### Introduce the Cartesian coordinate system using all four quadrants

- recognise that the number plane (Cartesian plane) is a visual way of describing location on a grid
- recognise that the number plane consists of a horizontal axis (x-axis) and a vertical axis (y-axis), creating four quadrants
- identify the point of intersection of the two axes as the origin, having coordinates (0, 0)
- plot and label points, given coordinates, in all four quadrants of the number plane
- identify and record the coordinates of given points in all four quadrants of the number plane

## Length 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and uses the appropriate unit and device to measure lengths and distances, calculates perimeters, and converts between units of length - MA3-9MG

### Vocabulary

length, distance, kilometre, metre, centimetre, millimetre, measure, measuring device, ruler, tape measure, trundle wheel, estimate, perimeter, dimensions, width, perimeter, dimensions, width.

	T1	T2	T3	T4
<b>Choose appropriate units of measurement for length</b>				
• estimate lengths and distances using an appropriate unit and check by measuring	■			
• record lengths and distances using combinations of millimetres, centimetres, metres and kilometres, e.g. 1 km 200 m	■			
<b>Calculate the perimeters of rectangles using familiar metric units</b>				
• use the term 'dimensions' to describe the 'lengths' and 'widths' of rectangles		■	■	
• measure and calculate the perimeter of a large rectangular section of the school, e.g. a playground, netball courts		■	■	
• calculate perimeters of common two-dimensional shapes, including squares, rectangles, triangles and regular polygons with more than four sides (i.e. regular polygons other than equilateral triangles and squares)		■	■	
• record calculations used to find the perimeters of two-dimensional shapes		■	■	

## Length 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and uses the appropriate unit and device to measure lengths and distances, calculates perimeters, and converts between units of length - MA3-9MG

### Vocabulary

length, distance, kilometre, metre, centimetre, millimetre, measure, measuring device, ruler, tape measure, trundle wheel, estimate, perimeter, dimensions, width, perimeter, dimensions, width.

	T1	T2	T3	T4
<b>Connect decimal representations to the metric system</b>				
• recognise the equivalence of whole-number and decimal representations of measurements of length, e.g. 165 cm is the same as 1.65 m	■			
• interpret decimal notation for lengths and distances, e.g. 13.5 cm is 13 centimetres and 5 millimetres	■			
• record lengths and distances using decimal notation to three decimal places, e.g. 2.753 km	■			
<b>Solve problems involving the comparison of lengths using appropriate units</b>				
• investigate and compare perimeters of rectangles with the same area		■	■	
• solve a variety of problems involving length and perimeter, including problems involving different units of length, e.g. 'Find the total length of three items measuring 5 mm, 20 cm and 1.2 m'		■	■	

## Area 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- selects and uses the appropriate unit to calculate areas, including areas of squares, rectangles and triangles - MA3-10MG

### Vocabulary

area, measure, square centimetre, square metre, square kilometre, hectare, dimensions, length, width, base (of triangle), perpendicular height, dimensions.

	T1	T2	T3	T4
<b>Solve problems involving the comparison of areas using appropriate units</b>				
• investigate the area of a triangle by comparing the area of a given triangle to the area of the rectangle of the same length and perpendicular height, e.g. use a copy of the given triangle with the given triangle to form a rectangle			■	
• establish the relationship between the base length, perpendicular height and area of a triangle			■	
• record, using words, the method for finding the area of any triangle, e.g. 'Area of triangle = $\frac{1}{2}$ × base × perpendicular height'			■	
• investigate and compare the areas of rectangles that have the same perimeter, e.g. compare the areas of all possible rectangles with whole-number dimensions and a perimeter of 20 centimetres				■
• solve a variety of problems involving the areas of rectangles (including squares) and triangles				■

## Volume & Capacity 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities, and converts between units of capacity - MA3-11MG

### Vocabulary

capacity, container, volume, layers, cubic centimetre, **cubic metre**, measure, estimate, **dimensions, length, width, height**, litre, millilitre.

T1 T2 T3 T4

### Choose appropriate units of measurement for volume and capacity

- select and use appropriate units to measure the capacities of a variety of containers, e.g. millilitres for a drinking glass, litres for a water urn

MR

## Volume & Capacity 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities, and converts between units of capacity - MA3-11MG

### Vocabulary

capacity, container, volume, layers, cubic centimetre, cubic metre, measure, estimate, dimensions, length, width, height, litre, millilitre.

T1 T2 T3 T4

### Connect volume and capacity and their units of measurement

- select the appropriate unit to measure volume and capacity
- demonstrate that a cube of side 10 cm will displace 1 litre of water
- demonstrate, by using a medicine cup, that a cube of side 1 cm will displace 1 mL of water
- equate 1 cubic centimetre to 1 millilitre and 1000 cubic centimetres to 1 litre
- find the volumes of irregular solids in cubic centimetres using a displacement strategy

MR

### Connect decimal representations to the metric system

- recognise the equivalence of whole-number and decimal representations of measurements of capacities, e.g. 375 mL is the same as 0.375 L
- interpret decimal notation for volumes and capacities, e.g. 8.7 L is the same as 8 litres and 700 millilitres
- record volume and capacity using decimal notation to three decimal places, e.g. 1.275 L

### Convert between common metric units of capacity

- convert between millilitres and litres

MR

### Calculate the volumes of rectangular prisms

- describe the 'length', 'width' and 'height' of a rectangular prism as the 'dimensions' of the prism
- construct rectangular prisms using cubic-centimetre blocks and count the blocks to determine the volumes of the prisms
- use repeated addition to find the volumes of rectangular prisms, e.g. 'My rectangle has 3 layers of 6 cubes, so the total number of cubes is 6 plus 6 plus 6, or 18'
- establish the relationship between the number of cubes in one layer, the number of layers, and the volume of a rectangular prism
- record, using words, the method for finding the volumes of rectangular prisms, e.g. 'Volume of rectangular prism = number of cubes in one layer × number of layers'
- calculate the volumes of rectangular prisms in cubic centimetres and cubic metres
- record calculations used to find the volumes of rectangular prisms

## Mass 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- selects and uses the appropriate unit and device to measure the masses of objects, and converts between units of mass - MA3-12MG

### Vocabulary

mass, gross mass, net mass, measure, device, scales, tonne, kilogram, gram.



	T1	T2	T3	T4
<b>Choose appropriate units of measurement for mass</b>				
• distinguish between the 'gross mass' and the 'net mass' of containers holding substances, e.g. cans of soup				
• find the approximate mass of a small object by establishing the mass of a number of that object, e.g. 'The stated weight of a box of chocolates is 250 g. If there are 20 identical chocolates in the box, what does each chocolate weigh?'				

## Mass 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- selects and uses the appropriate unit and device to measure the masses of objects, and converts between units of mass - MA3-12MG

### Vocabulary

mass, gross mass, net mass, measure, device, scales, tonne, kilogram, gram.

	T1	T2	T3	T4
<b>Connect decimal representations to the metric system</b>				
• recognise the equivalence of whole-number and decimal representations of measurements of mass, e.g. 3 kg 250 g is the same as 3.25 kg				
• interpret decimal notation for masses, e.g. 2.08 kg is the same as 2 kilograms and 80 grams				
• measure mass using scales and record using decimal notation of up to three decimal places, e.g. 0.875 kg				
<b>Convert between common metric units of mass</b>				
• convert between kilograms and grams and between kilograms and tonnes	MR	MR		
• solve problems involving different units of mass, e.g. find the total mass of three items weighing 50 g, 750 g and 2.5 kg	MR	MR		
• relate the mass of one litre of water to one kilogram				

## Time 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- uses 24-hour time and am and pm notation in real-life situations, and constructs timelines - MA3-13MG

### Vocabulary

12-hour time, 24-hour time, time zone, daylight saving, local time, hour, minute, second, am (notation), pm (notation), scale, timetable, timeline.

	T1	T2	T3	T4
<b>Compare 12- and 24-hour time systems and convert between them</b>				
• tell the time accurately using 24-hour time, e.g. '2330 is the same as 11:30 pm'				
• convert between 24-hour time and time given using am or pm notation				
• compare the local times in various time zones in Australia, including during daylight saving	MR			

## Time 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- uses 24-hour time and am and pm notation in real-life situations, and constructs timelines - MA3-13MG

### Vocabulary

12-hour time, 24-hour time, time zone, daylight saving, local time, hour, minute, second, am (notation), pm (notation), scale, timetable, timeline.

	T1	T2	T3	T4
<b>Interpret and use timetables</b>				
• read, interpret and use timetables from real-life situations, including those involving 24-hour time			MR	
• use bus, train, ferry and airline timetables, including those accessed on the internet, to prepare simple travel itineraries				
<b>Draw and interpret timelines using a given scale</b>				
• determine a suitable scale and draw an accurate timeline using the scale, e.g. represent events using a many-to-one scale of 1 cm = 10 years				



• interpret a given timeline using the given scale				
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## Three-Dimensional Space 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- identifies three-dimensional objects, including prisms and pyramids, on the basis of their properties, and visualises, sketches and constructs them given drawings of different views - MA3-14MG

### Vocabulary

object, shape, three-dimensional object (3D object), prism, cube, pyramid, base, uniform cross-section, face, edge, vertex (vertices), apex, top view, front view, side view, depth, net.

T1 T2 T3 T4

### Compare, describe and name prisms and pyramids

• visualise and draw the resulting cut face (plane section) when a three-dimensional object receives a straight cut				
• recognise that prisms have a 'uniform cross-section' when the section is parallel to the base				
• recognise that pyramids do not have a uniform cross-section when the section is parallel to the base				

### Connect three-dimensional objects with their nets and other two-dimensional representations

• visualise and sketch three-dimensional objects from different views, including top, front and side views				
• examine a diagram to determine whether it is or is not the net of a closed three-dimensional object				
• visualise and sketch nets for given three-dimensional objects				
• visualise and name prisms and pyramids, given diagrams of their nets				
• show simple perspective in drawings by showing depth				

## Three-Dimensional Space 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- identifies three-dimensional objects, including prisms and pyramids, on the basis of their properties, and visualises, sketches and constructs them given drawings of different views - MA3-14MG

### Vocabulary

object, shape, three-dimensional object (3D object), prism, cube, pyramid, base, uniform cross-section, face, edge, vertex (vertices), apex, top view, front view, side view, depth, net.

T1 T2 T3 T4

### Construct simple prisms and pyramids

• create skeletal models of prisms and pyramids, e.g. using toothpicks and modelling clay or straws and tape				
• construct three-dimensional models of prisms and pyramids and sketch the front, side and top views				
• construct three-dimensional models of prisms and pyramids, given drawings of different views				

## Two-Dimensional Space 1

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties - MA3-15MG

### Vocabulary

shape, two-dimensional shape (2D shape), triangle, equilateral triangle, isosceles triangle, scalene triangle, right-angled triangle, quadrilateral, parallelogram, rectangle, rhombus, square, trapezium, kite, pentagon, hexagon, octagon, regular shape, irregular shape, features, properties, side, parallel, pair of parallel sides, opposite, length, vertex (vertices), angle, right angle, line (axis) of symmetry, rotational symmetry, order of rotational symmetry, translate, reflect, rotate, enlarge, centre, radius, diameter, circumference, sector, semicircle, quadrant, diagonal, circle, centre, radius, diameter, circumference, sector, semicircle, quadrant, diagonal, clockwise, anti-clockwise.

T1 T2 T3 T4

### Identify line and rotational symmetries

• identify and quantify the total number of lines (axes) of symmetry (if any exist) of two-dimensional shapes, including the special quadrilaterals and triangles				
• identify shapes that have rotational symmetry and determine the 'order' of rotational symmetry				

Apply the enlargement transformation to familiar two-dimensional shapes and explore the properties of the resulting image compared with the original				
• make enlargements of two-dimensional shapes, pictures and maps, with and without the use of digital technologies				
• compare representations of shapes, pictures and maps in different sizes, e.g. student drawings enlarged on a photocopier				

## Two-Dimensional Space 2

Outcomes				
• describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM				
• selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM				
• manipulates, classifies and draws two-dimensional shapes, including equilateral, isosceles and scalene triangles, and describes their properties - MA3-15MG				

Vocabulary				
shape, two-dimensional shape (2D shape), triangle, equilateral triangle, isosceles triangle, scalene triangle, right-angled triangle, quadrilateral, parallelogram, rectangle, rhombus, square, trapezium, kite, pentagon, hexagon, octagon, regular shape, irregular shape, features, properties, side, parallel, pair of parallel sides, opposite, length, vertex (vertices), angle, right angle, line (axis) of symmetry, rotational symmetry, order of rotational symmetry, translate, reflect, rotate, enlarge, centre, radius, diameter, circumference, sector, semicircle, quadrant, diagonal, circle, centre, radius, diameter, circumference, sector, semicircle, quadrant, diagonal, clockwise, anti-clockwise.				

	T1	T2	T3	T4
Investigate the diagonals of two-dimensional shapes				
• identify and name 'diagonals' of convex two-dimensional shapes				
• determine and draw all the diagonals of convex two-dimensional shapes				
• compare and describe diagonals of different convex two-dimensional shapes				
Identify and name parts of circles				
• create a circle by finding points that are all the same distance from a fixed point (the centre)				
• identify and name parts of a circle, including the centre, radius, diameter, circumference, sector, semicircle and quadrant				
Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies				
• identify whether a two-dimensional shape has been translated, reflected or rotated, or has undergone a number of transformations, e.g. 'The parallelogram has been rotated clockwise through 90° once and then reflected once'				
• construct patterns of two-dimensional shapes that involve translations, reflections and rotations using computer software				
• predict the next translation, reflection or rotation in a pattern, e.g. 'The arrow is being rotated 90° anti-clockwise each time'				

## Angles 2

Outcomes				
• describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM				
• measures and constructs angles, and applies angle relationships to find unknown angles - MA3-16MG				

Vocabulary				
angle, arm, vertex, protractor, degree, angles on a straight line, angle of revolution, angles at a point, vertically opposite angles, right angle, straight angle.				

	T1	T2	T3	T4
Investigate, with and without the use of digital technologies, angles on a straight line, angles at a point, and vertically opposite angles; use the results to find unknown angles				
• identify and name angle types formed by the intersection of straight lines, including right angles, 'angles on a straight line', 'angles at a point' that form an angle of revolution, and 'vertically opposite angles'				
• investigate, with and without the use of digital technologies, adjacent angles that form a right angle and establish that they add to 90°				
• investigate, with and without the use of digital technologies, adjacent angles on a straight line and establish that they form a straight angle and add to 180°				
• investigate, with and without the use of digital technologies, angles at a point and establish that they form an angle of revolution and add to 360°				
• use the results established for adjacent angles that form right angles, straight angles and angles of revolution to find the size of unknown angles in diagrams				
• investigate, with and without the use of digital technologies, vertically opposite angles and establish that they are equal in size				
• use the equality of vertically opposite angles to find the size of unknown angles in diagrams				

## Position

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- locates and describes position on maps using a grid-reference system - MA3-17MG

### Vocabulary

position, location, map, plan, street directory, route, grid, grid reference, legend, key, scale, directions, compass, north, east, south, west, north-east, south-east, south-west, north-west.

T1	T2	T3	T4
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### Use a grid-reference system to describe locations

- |  |  |  |    |  |
|--|--|--|----|--|
| <ul style="list-style-type: none"> <li>describe particular locations on grid-referenced maps, including maps with a legend, e.g. 'The post office is at E4'</li> </ul> |  |  | MR |  |
|--|--|--|----|--|

### Describe routes using landmarks and directional language

- |  |  |  |    |  |
|--|--|--|----|--|
| <ul style="list-style-type: none"> <li>find a location on a map that is in a given direction from a town or landmark, e.g. locate a town that is north-east of Broken Hill</li> </ul>  |  |  | MR |  |
| <ul style="list-style-type: none"> <li>describe the direction of one location relative to another, e.g. 'Darwin is north-west of Sydney'</li> </ul>  |  |  | MR |  |
| <ul style="list-style-type: none"> <li>follow a sequence of two or more directions, including compass directions, to find and identify a particular location on a map</li> </ul>   |  |  |    |  |
| <ul style="list-style-type: none"> <li>use a given map to plan and show a route from one location to another, e.g. draw a possible route to the local park or use an Aboriginal land map to plan a route</li> </ul>                                      |  |  |    |  |
| <ul style="list-style-type: none"> <li>describe a route taken on a map using landmarks and directional language, including compass directions, e.g. 'Start at the post office, go west to the supermarket and then go south-west to the park'</li> </ul> |  |  |    |  |

## Data 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables - MA3-18SP

### Vocabulary

data, survey, category, display, tabulate, table, column graph, vertical columns, horizontal bars, equal spacing, title, scale, vertical axis, horizontal axis, axes, line graph, dot plots, spreadsheet, collect, category, two-way table, side-by-side column graph, misleading, bias.

T1	T2	T3	T4
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### Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables

- | <ul style="list-style-type: none"> <li>interpret data presented in two-way tables</li> </ul>   |        |       |       |      |   |   |       |   |   |       |   |   |  |  |  |  |
|--|--------|-------|-------|------|---|---|-------|---|---|-------|---|---|--|--|--|--|
| <ul style="list-style-type: none"> <li>create a two-way table to organise data involving two categorical variables, e.g.                     <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>Drinks</th> <th>Boys</th> <th>Girls</th> </tr> </thead> <tbody> <tr> <td>Milk</td> <td>5</td> <td>6</td> </tr> <tr> <td>Water</td> <td>3</td> <td>2</td> </tr> <tr> <td>Juice</td> <td>2</td> <td>1</td> </tr> </tbody> </table> </li> </ul> | Drinks | Boys  | Girls | Milk | 5 | 6 | Water | 3 | 2 | Juice | 2 | 1 |  |  |  |  |
| Drinks   | Boys   | Girls |       |      |   |   |       |   |   |       |   |   |  |  |  |  |
| Milk   | 5      | 6     |       |      |   |   |       |   |   |       |   |   |  |  |  |  |
| Water  | 3      | 2     |       |      |   |   |       |   |   |       |   |   |  |  |  |  |
| Juice  | 2      | 1     |       |      |   |   |       |   |   |       |   |   |  |  |  |  |
| <ul style="list-style-type: none"> <li>interpret side-by-side column graphs for two categorical variables, e.g. favourite television show of students in Year 1 compared to that of students in Year 6</li> </ul>  |        |       |       |      |   |   |       |   |   |       |   |   |  |  |  |  |
| <ul style="list-style-type: none"> <li>interpret and compare different displays of the same data set to determine the most appropriate display for the data set</li> </ul>   |        |       |       |      |   |   |       |   |   |       |   |   |  |  |  |  |

### Interpret secondary data presented in digital media and elsewhere

- |  |  |  |  |  |
|--|--|--|--|--|
| <ul style="list-style-type: none"> <li>interpret data representations found in digital media and in factual texts</li> </ul>         |  |  |  |  |
| <ul style="list-style-type: none"> <li>critically evaluate data representations found in digital media and related claims</li> </ul> |  |  |  |  |

## Chance 2

### Outcomes

- describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions - MA3-1WM
- selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations - MA3-2WM
- gives a valid reason for supporting one possible solution over another - MA3-3WM
- conducts chance experiments and assigns probabilities as values between 0 and 1 to describe their outcomes - MA3-19SP

### Vocabulary

chance, event, likelihood, certain, possible, likely, unlikely, impossible, experiment, outcome, probability, equally likely, expected outcomes, random, fair, trials, expected probability, observed probability, frequency, expected frequency, observed frequency.

T1	T2	T3	T4
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### Compare observed frequencies across experiments with expected frequencies

- |   |  |  |  |  |
|---|--|--|--|--|
| <ul style="list-style-type: none"> <li>use the term 'frequency' to describe the number of times a particular outcome occurs in a chance experiment</li> </ul> |  |  |  |  |
|---|--|--|--|--|

<ul style="list-style-type: none"> <li>compare the expected frequencies of outcomes of chance experiments with observed frequencies, including where the outcomes are not equally likely</li> </ul>							
<b>Describe probabilities using fractions, decimals and percentages</b>							
<ul style="list-style-type: none"> <li>list the outcomes for chance experiments where the outcomes are not equally likely to occur and assign probabilities to the outcomes using fractions</li> </ul>							
<ul style="list-style-type: none"> <li>use knowledge of equivalent fractions, decimals and percentages to assign probabilities to the likelihood of outcomes, e.g. there is a 'five in ten', <math>\frac{1}{2}</math>, 50%, 0.5 or 'one in two' chance of a particular event occurring</li> </ul>							
<b>Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies</b>							
<ul style="list-style-type: none"> <li>assign expected probabilities to outcomes in chance experiments with random generators, including digital simulators, and compare the expected probabilities with the observed probabilities after both small and large numbers of trials</li> </ul>							
<ul style="list-style-type: none"> <li>use samples to make predictions about a larger 'population' from which the sample comes, e.g. take a random sample of coloured lollies from a bag, calculate the probability of obtaining each colour of lolly when drawing a lolly from the bag, and use these probabilities and the total number of lollies in the bag to predict the number of each colour of lolly in the bag</li> </ul>							