Colour coded by the rainbow

Year 6

Year 5

Year 4

Years 3-6
Unit Plan

Year 3

Year 2

Link to the New Early Years Unit Plan

Year 1

Link to the New Early Years Unit Plan

Foundation / Kindergarten

Link to the New Early Years Unit Plan

Critical Learning Goals and Checkpoints

Created and used by teams in Top Ten Maths pilot schools to provide a strong sequence of big ideas for each year level, and to guide teachers as to the main priorities for their year level for number and algebra.

Where teams find a particular element of the curriculum progresses very fast for particular year levels (for example, year 3/4 students are expected to learn all the times tables during those two years), the content has been more realistically broken down and allocated to teams to make it more developmentally achievable. Likewise, some skills intentionally front-load content that can be achieved earlier, such as students learning the names of the tens by skip-counting by 10 up to 120 during the first year of school, even though the curriculum does not require this until year 1.

Skills and Strategies Staircases

Mathematical development follows a sequential staircase of skills and strategies. This means that if one step in the staircase is missing, this will become a major obstacle for the student, unless that skill or strategy is addressed, before progressing to the more advanced content.

Consider the build to ten addition strategy as an example. To use this strategy, a student must be able to work out that 8 + 5 can be solved by thinking 8 + 2 (makes 10) + 3 more makes 13. This appears simple on the surface for adults who are fluent, but for students this requires the ability to partition 5 fluently into parts, then hold these parts while applying the 10 facts with fluency as well. It also relies partly on the counting on concept, in that you must start from the larger of the two addends (the 8, rather than the 5). In all, you need to have mastered three previous steps in the addition skills and strategies staircase to have any opportunity to master the build to ten strategy. Without ensuring students have already mastered all these previous steps first, a teacher could spend months trying to develop their students' understanding and fluency of the build to ten strategy, to no avail.

Critical Checkpoints for Place Value

The big goals, by the end of the unit, are that all students in this year level can:

First Year of School	**Count, make and read numbers up to 10** with 1-1 correspondence, and ordinal numbers up to 10	**Subitise regular/dot dice formats** see collections of things straight away, e.g. "I see 3, I see 3, I see 6!"	**Correctly form all digits** (0-9 starting from the top, without reversals) Compare and order single-digit numbers	**Work out one more / less of a single-digit number**
Year 1	**Count to and back from 120 from any starting point** learning the names of the tens; bridging over 100 correctly, e.g. 99, 100, 101, 102 90, 100, 110, 120	**Subitise irregular / random formats** see small numbers straight away, even when arranged randomly, "I see 5, I see 3, I see 8!"	**Say, write and order numbers to 100** make using bundling materials and place value blocks; rename, e.g. 34 is 3t + 4 ones or 2t and 14 ones Round to ten	**Work out one more and one less of a two-digit number**
Year 2	**Count to and back from 1000 from any starting point**	**Say, write and order numbers to 1000** Round to nearest hundred	**Make numbers up to 1000 with place value blocks** Expanded form (e.g. 452 = 4h 5t 2); place on number lines	**Work out ten more / less of 2- and 3-digit numbers**

<table>
<tr><td>Year 3</td><td>Rename 3- and 4-digit numbers
e.g. 340 as 34 tens, 340 ones, 2h + 14t

e.g. 4530 as 45 hundreds and 3 tens, or 453 tens</td><td>Say, write and order numbers up to 10 000,
focus on internal zeroes in particular</td><td>Make numbers up to 10 000 using place value blocks
Placing on number lines, round to nearest thousand</td><td>Work out 100 and 1000 more / less of any 4-digit number</td></tr>
<tr><td>Year 4</td><td>Estimate large collections accurately
(within 25% at least)</td><td>Say, write in words and order numbers up to 100 000
Flexible expanded form (67 000 as 50 000 + 17 000)</td><td>Flexibly work with numbers up to 100 000
placing on number lines, rounding to all places, renaming</td><td>Represent decimals as money
($0.65), round to nearest whole</td></tr>
<tr><td>Year 5</td><td>Work out the factors and multiples of 2-digit numbers
Connect factors to divisibility (if you divide 63 by 7, there will be no remainders, since 7 is a factor of 63)</td><td>Flexibly work with numbers up to 1 000 000
Round to all places; rename; place on number lines; flexible expanded form (168 350 + 150 000, partition 168 350 into 150 000 and 18 350, to double the 150 000 first)</td><td>Compare and order numbers up to three decimal places</td><td>Place unit fractions (1/6, 1/9) and decimals up to 3 places on number lines</td></tr>
<tr><td>Year 6</td><td>Identify prime, composite, square and triangular numbers</td><td>Create and solve algebraic rules
<table><tr><td>INPUT</td><td>OUTPUT</td></tr><tr><td>5</td><td>13</td></tr><tr><td>30</td><td>88</td></tr><tr><td>120</td><td>358</td></tr><tr><td colspan="2">Rule is x3 - 2</td></tr></table></td><td>Work with integers, particularly negative whole numbers</td><td>Place proper fractions, decimals and integers on number lines</td></tr>
</table>

Place Value Staircase
Early Years

Year 2

- Work out ten more / less of any 2- and 3-digit number
- Rename (234 as 23 tens and 4 ones, 234 ones, 22 tens and 14 ones)
- Round to the nearest hundred
- Make numbers up to 1000 using place value blocks, partitioning into hundreds, tens and ones
- Count to and back from 1000 from any starting point

Units 14-16

If there are no gaps showing from earlier units.

Year 1

- Round to the nearest ten, rename 2-digit numbers and place 2-digit numbers on number lines — Unit 14
- Work out one more / less of any two-digit number — Unit 12
- Make numbers up to 100 using bundling materials, partitioning into tens and ones — Units 12 and 13
- Count to 120 by tens, then by ones, understanding the place value pattern that repeats for every ten — Unit 11
- Subitise collections that are arranged randomly — Unit 6

Foundation / Kindergarten

- Work out one more/less of any single-digit number, and order numbers up to 10 — Units 7 and 8
- Subitise (use superhero eyes) to see collections where numbers are arranged in the same format as dot-dice — Unit 5
- Correctly form all digits from top-to-bottom — Unit 4
- Count to 3, then to 5, then to 10, then to 20 with one-to-one correspondence (touch and say counting) — Place Value Units 2 and 3
- Count to 3, then to 5, then to 10, then to 20 by rote (chanting/song) — New Early Years Pack: Place Value Unit 1

Place Value Staircase
Years 3-6

Year 6

- Place fractions (non-unit, for example, 3/5), decimals and integers on number lines
- Work with integers (particularly negative whole numbers)
- Identify prime, composite, square and triangular numbers
- Work with millions numbers and beyond

Year 5

- Place unit fractions and decimals on number lines
- Record, compare and order decimals up to 3 places
- Flexibly work with hundreds of thousands numbers, recording in all formats (words, digits, expanded form), renaming and flexibly partitioning
- Work out factors and multiples of numbers

Year 4

- Understand and record decimals as money and measurements (0.6 as $0.60 and or 0.6m), round to nearest whole
- Rename and flexibly partition tens of thousands numbers
- Round tens of thousands numbers to any place value
- Say, write and order numbers up to 100 000
- Estimate large collections with accuracy (within 25%)

Years 3-6
Place Value

Year 3

- Work out 100 and 1000 more and less than any 2-, 3- and 4-digit number using an understanding of place value (which places change, and which stay the same)
- Rename 3- and 4-digit numbers
- Round numbers up to 10 000 to the nearest ten, hundred and thousand
- Make numbers up to 10 000 using place value blocks, recording in digits, words and expanded form

Critical Checkpoints for Addition

The big goals, by the end of the unit, are that all students in this year level can:

First Year of School	**Count all to solve an addition situation and retell it orally using the word 'and',** e.g. "I have 3 jelly beans AND you have 4 jelly beans. We have 7 jelly beans altogether!"	**Fluently partition numbers up to 6** (can name all the combinations/ways to make 3, 4, 5 and 6 without materials, e.g. 3 and 3 makes 6, 4 and 2 makes 6, 5 and 1 makes 6)	**Solve one more than any single-digit number** e.g. 7 + 1, immediately thinks 1 more than 7 is 8 and can solve without materials
Year 1	**Draw or write an addition (and) story to match an equation** e.g. the student is given 3 + 4, they draw, write or retell orally: "I have 3 red M&Ms and 4 blue M&Ms, I have 7 altogether!"	**Fluently recall the 10 facts and partition all numbers up to 10** (knows all the ways to make 7, 8, 9 and 10)	**Count on from the larger number by using turnarounds (commutativity) for single-digit additions** e.g. 2 + 5, start at 5 and counts 2 more mentally
Year 2	**Fluently recall the doubles facts up to 10 + 10** (2+2, 3+3, 4+4, 5+5, 6+6, 7+7, 8+8, 9+9, 10+10)	**Use near doubles and explain how they did it** (6 and 7, I thought 7 and 7 – 1 OR 6 and 6 + 1 more)	**Build to 10 and explains how** (e.g. 7 and 5, I did 7 + 3 + 2; or, alternatively, I thought 6 + 6 by moving 1 from the 7 to the 5)

Year 3	**Add 5 or more numbers using the best strategies for that equation** (10s facts, doubles, near doubles, building to 10)	**Use jump and split strategies on paper to solve 2- and 3-digit problems** Estimates by rounding to nearest 10 or 100 first	**Use place value to partition numbers to make additions easier** e.g. 500 + 670 = 500 + 500 + 170 = 1170 Extends number facts: 2 + 3 = 5, so 2h + 3h = 5h
Year 4	**Use single-digit strategies (near doubles and building to ten) for larger place values** e.g. 670 + 780, thinks 6 + 7 = 13 (near doubles), 6h + 7h = 13h, 70 + 80 = double 7t + 1t = 15t, so 1450	**Use the jump and split strategies mentally to solve 2- and 3-digit addition problems**	**Use the vertical algorithm, including renaming up to 5 digits**
Year 5	**Use the compensation strategy for larger place values** e.g. 670 + 780 is the same as 700 (pretend the 670 is 700) + 800 (pretend 780 is 800) – 50 (what you added to both), so 1450	**Make reasonable estimates using rounding before calculating answers**	**Use the vertical algorithm for additions of any size**
Year 6	**Choose the best strategy to solve complex worded problems involving addition** (jump strategy, split strategy, vertical algorithm, excluding irrelevant information)		**Use the vertical algorithm to add decimals** Estimates first by rounding to the nearest whole

Addition Skills and Strategies Staircase

Years 3-6 Addition

Year 6

- Chooses the best strategy for complex worded problems

Years 4 and 5

- Vertical algorithm (for year 6: decimals)
- Estimates before solving using rounding and place value
- Split and jump strategies mentally

Year 3

- Uses place value to flexibly partition and solve
- Jump and split strategies on paper
- Chooses the best single-digit strategy (near doubles, building to ten) for the numbers involved

Year 2

- Add ten to any 2- and 3-digit number — Place Value Unit 12 Lesson 18 and Unit 15
- Build to 10 strategy — Addition Unit 8
- Near doubles strategy — Addition Unit 7
- Doubles facts — Addition Unit 6

Year 1

- 10 facts — Addition Unit 5
- Partition (know all the combinations that make) 7, 8 and 9 — Addition Unit 4
- Count on from the larger number — Addition Unit 3

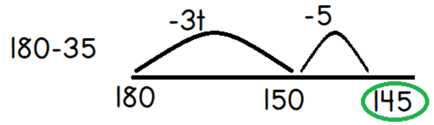
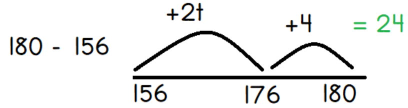
Foundation / Kindergarten

- Fluently partition (know all the ways to make) 3, 4, 5 and 6, linking this to subitising (“I see_, I see_, that makes_”) — Addition Unit 4
- Work out one more of any single-digit number — Addition Unit 2
- Use count-all to solve ‘and’ stories — Addition Unit 1
- Count with one-to-one correspondence and subitise small collections — Place Value Units 2-3 for counting, Place Value Units 5-6 for subitising

Critical Checkpoints for Subtraction

The big goals, by the end of the unit, are that all students in this year level can:

First Year of School	**Model a subtraction with materials and retell it orally using 'take away'** (e.g. "I had 3 jellybeans, but my brother took one away. 2 were left!")	**Use fingers and drawings to solve subtraction problems**	**Solve one less than any single-digit number** e.g. 7 – 1, immediately thinks 1 less than 7 is 6 and can solve without materials
Year 1	**Fluently recall the backwards 10 facts** (10 – 3 = 7, because I know 7 + 3 = 10) **Solve a simple worded subtraction problem**	**Count back to solve subtractions from up to 20**	**Count on to solve the difference between numbers to 10** (e.g. 9 – 7, "8 9, it's 2")
Year 2	**Use backwards doubles and explain how** (e.g. 14 – 7, I thought 7 + 7 = 14, so 14 – 7 = 7) **Create a simple worded subtraction problem**	**Counts and jumps back to solve 2-digit subtractions,** including jumping back by tens, e.g. 80 – 17, start with 80 – 10 to get to 70, then 70 – 7 = 63	**Can count on to solve the difference between numbers up to 20** (e.g. 20 – 17, the difference is 3)

Year 3	**Apply fact families to use addition facts** (e.g. 28 – 22, I know 22 + 6 is 28, so it is 6; instead of counting or jump back by 22 from 28)	**Use 'jump back' on paper** 	**Use 'jump the difference' on paper** 
Year 4	**Use the compensation strategy** e.g. 405 – 98 = 405 – 1h + 2 **Calculate change to the nearest five cents by counting on or using the vertical algorithm**	**Use 'jump back' strategy mentally for 2- and 3-digit subtractions** e.g. 657 – 63, start at 657, jump back 57 to get to 600, jump back another 6 (to take away the full 63), the answer is 594	**Use the vertical algorithm, including renaming up to 5 digits**
Year 5	**Use the 'get to 9' strategy to solve subtractions with internal zeroes** e.g. 8003 – 6578 Instead of renaming, change the 8003 to 7999 by taking away 4, also take 4 away from 6578 so the difference is still the same: = 7999 – 6574 Then solve in the algorithm (without needing to rename at all)	**Use 'jump the difference' strategy mentally for 2- and 3-digit subtractions** e.g. 657 – 582, start at 582 + 18 to get to 600, then add 57 to reach 657, the difference was 57 + 18, so 75	**Use the vertical algorithm for subtractions of any size**
Year 6	**Chooses the best strategies to solve complex worded subtraction problems** (jump back strategy, jump the difference strategy, vertical algorithm, get to 9 strategy)		**Use the vertical algorithm to subtract decimals**

Subtraction Skills and Strategies Staircase

Years 3-6 Subtraction

Year 6

- Chooses the best strategy for the complex worded problems

Years 4 and 5

- Get to 9 strategy
- Vertical algorithm (in year 6: decimals)
- Uses jump back, jump the difference and compensation strategies mentally

Year 3

- Uses the jump back and jump the difference strategies on number lines
- Applies fact families and the ‘think addition’ strategy

Year 2

- Subtract ten from any 2- and 3-digit number — **Place Value Unit 12 Lesson 18**
- Use difference between to solve subtraction problems for 2-digit numbers (54 – 38, 38 + 2 makes 40, then + 14, the difference is 16) — **Subtraction Unit 7**
- Backwards doubles — **Subtraction Unit 6**
- Backwards 10 facts — **Subtraction Unit 5**

Year 1

- Use counting on and fact families to solve subtractions up to 10 (7 – 5, the difference is 2 because 5 + 2 = 7) — **Subtraction Unit 4**
- Count back to solve subtractions from up to 100 — **Subtraction Unit 3**
- Count back to solve subtractions from up to 20 — **Subtraction Unit 3**

Foundation / Kindergarten

- Work out one less of any single-digit number — **Subtraction Unit 2**
- Use fingers and drawings to solve subtraction problems — **Subtraction Unit 1**
- Count what is left with materials to solve ‘take away’ stories — **New Early Years Pack Subtraction Unit 1**
- Count with one-to-one correspondence and subitise small collections — **Place Value Units 2-3 for counting, Place Value Units 5-6 for subitising**

Critical Checkpoints for Multiplication

The big goals, by the end of the unit, are that all students in this year level can:

First Year of School	**Say whether groups are equal or unequal**	**Create equal groups using objects, naming the number that is common to each**	**Skip-count by 10 from zero up to 120** (learn the names of the tens)
Year 1	**Name how many groups there are and the same number that is in each group**	**Use skip-counting as a strategy to solve small totals, recording using repeated addition number sentences**	**Skip-count by 5 and 2 from zero**
Year 2	**Create arrays and solve these by skip-counting** (by 10, 2, 5, 3 and 4); use arrays to model turnarounds (3 x 2 = 2 x 3)	**Fluently know the 2 (doubling) times tables strategy** knows the multiples and factors, can write fact families for the 2 times tables	**Skip-count by 10, 5, 2 and 3 from any starting point**
Year 3	**Partition arrays to develop times tables strategies** (3x6 as double 6 and 6 more, 2x18 as double 18, 4x6 as double double 6)	**Fluently use the 10 (think tens), 5 (x10 and half it) and 3 (double + one group) times tables strategies,** knows multiples and factors, can write fact families for these times tables	**Skip-count by 7s, 8s and 9s from zero** (for 9s, think 10 more 1 back; for 8s, think 10 more 2 back; for 7s 10 more 3 back)

<table>
<tr><td rowspan="2">Year 3</td><td colspan="3">Write and solve ‘groups of’ problems given a set equation
(e.g. create a real-life problem about 10 x 3, swap with a partner and solve)</td></tr>
<tr><td colspan="3">Multiply 1-digit by a tens number using place value or the factorise strategy (e.g. 3 x 20 as 3 x 2 tens = 6 tens OR as 3 x 2 x 10 = 6 x 10 = 60)</td></tr>
<tr><td rowspan="2">Year 4</td><td>Fluently use the 4 times tables strategy (double double)
e.g. 4 x 7, see 4x think double double the other number, d7 = 14, dd = 28</td><td>Fluently use the 8 times tables strategy (double double double)</td><td>Factorise as a multiplication strategy (e.g. 18 x 5 = 9 x 2 x 5 = 9 x 10 = 90)</td></tr>
<tr><td>Multiply 2-digit numbers by partitioning tens and ones mentally
(e.g. 4 x 23, think 4 x 2 tens and 4 x 3 = 80 + 12 = 92)</td><td>Multiply 2-digit numbers by applying the times tables strategies
e.g. 4 x 23 think double double</td><td>Use the area model for 1- by 2-digits</td></tr>
<tr><td>Year 5</td><td>Apply times tables and factorising strategies to 2- by 2-digit problems
e.g. 12x25 = 3 x 4 x 25 = 3 x 100 = 300; or 10 x 25 + 2 x 25</td><td>Fluently use the 9 times tables strategy (x10 – one group)

Fluently use the 6 times tables strategy (double 3s, or use turnarounds)</td><td>Skip-count by any single-digit interval from any number</td></tr>
</table>

Year 5	**Estimate answers to multiplications using rounding and place value patterns** (e.g. 17 x 52, round to 20 x 50 2 x 5 = 10, 2 x 50 = 100 So: 20 x 50 = 1000) E ≈ 1000	**Uses the area model to multiply 1-digit by 4-digits, and 2-digits by 2-digits**	**Use the lattice strategy <u>or</u> vertical algorithm to solve 2-digits by 3-digits**
Year 6	**Fluently know the 7** (use commutativity) **times tables** (7x3, think 3x7, solve using 3 times tables instead)	**Use their <u>preferred strategy</u> (lattice, area, vertical algorithm) to multiply 2-digit by 4-digit numbers**	**Multiply decimals by whole numbers**
	Chooses the best strategies to solve complex worded problems involving multiplication	**Apply the order of operations** (BODMAS)	**Skip-count by decimals and fractions with the same denominator**

Multiplication Skills and Strategies Staircase

Year 3

- Multiply 1-digit by tens using place value and factorising strategies
- Solve and write their own simple worded multiplication problems
- Skip-count by 9, 8 and 7 (think 10 more 1 back for 9s, 10 more 2 back for 8s, 10 more 3 back for 7s)
- Fluently use the x3 strategy (double + one group)
- Fluently use the x5 strategy (think tens and halve it, or halve it then x10)
- Fluently use the x10 strategy (think in tens)

Years 3-6 Multiplication Unit

- Partition arrays to develop the times tables strategies — **Multiplication Unit 4**

Year 2

- Fluently use the 2 times tables strategy (doubling) — **Addition Unit 6 Doubles**
- Use arrays to model and solve turnarounds (solve 10 x 2 as 2 x 10) — **Multiplication Unit 4**
- Create and solve arrays by skip-counting, using the language of rows and columns — **Multiplication Unit 4**
- Skip-count by 10, 5, 2 and 3 from any starting point — **Multiplication Unit 2 Lessons 8-11**

Year 1

- Skip-count by other sequences to solve small ‘groups of’ problems with materials — **Multiplication Unit 3**
- Skip-count by 5 and 2 from zero — **Multiplication Unit 2 Lessons 1-2, 5-7**
- Name the number of groups and the same number that is in each — **Multiplication Unit 1**

F / K

- Skip-count by 10 from zero — **Multiplication Unit 2 Warm-Ups and Lessons 3-4**
- Create equal groups and name the number that is common to each
- Say whether groups are equal or unequal

New Early Years Pack Place Value Units 5-6 on Subitising and Multiplication Unit 1

Multiplication Skills and Strategies Staircase

Years 3-6
Multiplication

Year 6

- Skip-count by decimals and fractions
- Apply the order of operations (BODMAS)
- Use their preferred strategy for 2- by 4-digits and decimals, solve complex worded problems
- Fluently know all times tables (including 7s)

Year 5

- Use the lattice strategy or vertical algorithm for up to 2- by 3-digit problems
- Use the area model for 1- by 4-digit and 2-digit by 2-digit problems
- Use times tables and factorising strategies for 2- by 2-digit problems
- Estimate answers by rounding
- Skip-count by any single-digit number from any non-zero starting point
- Fluently use the 6 times tables strategy (double the 3s, or turnaround known facts)
- Fluently use the 9 times tables strategy (x10 – one group)

Year 4

- Use the area model for 1-digit by 2-digits
- Multiply by partitioning (breaking up) tens and ones mentally
- Factorise as a multiplication strategy (18 x 5 as 9 x 2 x 5 = 9 x 10 = 90)
- Multiply by applying the times tables strategies to larger numbers
- Fluently use the 8 times tables strategy (double double double)
- Fluently use the 4 times tables strategy (double double)

Critical Checkpoints for Division

The big goals, by the end of the unit, are that all students in this year level can:

First Year of School	**Share objects equally between 2 people**	**Skip-count backwards by 10 from 120**	
Year 1	**Share objects into equal groups and describe remainders** e.g. "13 shared between 5 gives 2 to each with 3 remainders"	**Skip-count backwards by 5 and 2 from 120**	**Write the number sentence for shared between situations with materials showing** e.g. 12 ÷ 3 = 4
Year 2	**Share objects using arrays** (*arr*anged into equal numbers of rows and columns)	**Fluently divide by 2** using backwards doubles / halving, fact family for 2xs **Use skip-counting as a strategy to solve divisions by 5 and 10**	**Write division number sentences that include remainders** e.g. 20 ÷ 7 = 2 r 6
Year 3	**Create and solve both partitive and quotitive problems** (e.g. Partition: 8 balloons, 4 people, how many did each person get? Quotition: 8 balloons, each person got 2, how many people?)	**Fluently divide by 10, 5 and 3 fact families** (uses reverse times tables; for 5s, divides by 10 then doubles it) explain divisibility by these patterns	**Make the connection between divisibility by 2 and odd/even numbers**

<table>
<tr><td>Year 3</td><td colspan="3">Using an array, record the full multiplication and division fact family
● ● ● ●
● ● ● ●
● ● ● ●
3 rows of 4 is 12 — 3 × 4 = 12
4 columns of 3 is 12 — 4 × 3 = 12
12 shared into 3 rows is 4 — 12 ÷ 3 = 4
12 shared into 4 columns is 3 — 12 ÷ 4 = 3</td></tr>
<tr><td rowspan="2">Year 4</td><td>Use fact families to solve and justify answers to divisions
(48 ÷ 8 = 6 because
6 x 8 = 48)</td><td>Fluently use the 4 and 8 times tables strategies to divide by halving (to divide by 4, half and half again, by 8 half half half)

Explains divisibility by these patterns</td><td>Use times tables to solve divisions involving remainders
e.g. 27 ÷ 6, if 4 x 6 = 24 and 5 x 6 = 30, it is 4 r 3, because 4 x 6 + 3 = 27

e.g. 17 ÷ 4 = 4 r 1
because 4 x 4 + 1 = 17</td></tr>
<tr><td colspan="3">Estimate 3- and 4-digit divisions using rounding and place value e.g. 540 ÷ 8, well 8 x 6t = 48t or 480, 8 x 7t = 56t or 560, so closer to 70 than 60</td></tr>
<tr><td>Year 5</td><td>Fluently divide by 6 (half, then divide by 3) and 9 (divide by 10 and round answer <u>up</u> to the next whole number; or just use the fact family)</td><td>Use mental strategies to divide 3-digits, including the multiply to divide strategy or partitioning into place values strategy:
253 ÷ 6, solve by:
6 x <u>40</u> = 240, 6 x <u>2</u> = 12, so
42 r 1 = $42\frac{1}{6}$
OR 240 ÷ 6 = 40
13 ÷ 6 = 2 r 1, so $42\frac{1}{6}$</td><td>Divide 3-digit numbers by 1-digit on paper using place values and the short/long division algorithm
e.g. 3248 ÷ 4, partition it:
3200 ÷ 4 = 800
40 ÷ 4 = 10
8 ÷ 4 = 2, so it is 812</td></tr>
</table>

<table>
<tr><td rowspan="2">Year 5</td><td colspan="3">Use different notations to represent division $25 \div 4,\ 4\overline{)25},\ \frac{25}{4}$</td></tr>
<tr><td colspan="3">Record remainders as fractions and decimals where appropriate for the context of the problem $25 \div 4 = 6\frac{1}{4}$ or 6.25</td></tr>
<tr><td rowspan="3">Year 6</td><td>Fluently divide by 7
(can now use all fact families to divide mentally)</td><td>Divide 4-digit numbers by 1-digit using the short or long division algorithm
(students can choose their preferred method)</td><td>Use the multiply to divide strategy for 3-digit divisions by a 2-digit number on paper e.g. to solve 564 ÷ 18:
18 x 10 = 180
18 x 20 = 360
18 x 30 = 540
So, it will be 30 groups of 18 + 1 more group of 18 (540 + 18= 558) with 6 remainders, so 31 r 6</td></tr>
<tr><td colspan="3">Chooses the best strategies to solve complex worded problems involving division (reverse times tables, estimating, multiply to divide strategy, partitioning place values strategy, short or long division algorithm)</td></tr>
<tr><td colspan="3">Divide decimals by 1-digit divisors e.g. 3.75 ÷ 3</td></tr>
</table>

Division Skills and Strategies Staircase

Year 3

Divide by 3 using reverse times tables strategies (fact family)	Multiplication Unit 4 extending prompts, Years 3-6 Division Unit
Divide by 5 using reverse times tables strategies (÷10, then x2)	
Divide by 10 using reverse times tables strategies	
Use an array to record a multiplication and division fact family	
Explain divisibility patterns by 10, 5 and 3	Division Unit 2 Lesson 11 Extension
Connect odd/even to divisibility by 2	Division Unit 2 Lesson 10
Create and solve partitive and quotitive division problems, understanding the difference between these two types of division situations	Division Unit 3

Year 2

Use skip-counting as a strategy to solve divisions by 5 and 10	Division Unit 3
Fluently divide by 2 up to 20 (using reverse doubles, halving and fact families for the 2 times tables)	Applying Addition Unit 6 Doubles and Division Unit 1 Share between 2
Record answers and remainders, e.g. 19 ÷ 5= 3 r 4	Division Unit 2
Share objects equally using arrays	Division Unit 2 by using the variations focused on arranging materials into arrays for these lessons

Year 1

Skip-count backwards by 5 and 2 from 120	Patterns Unit 2
Record answers using division number sentences, e.g. 12 ÷ 3= 4	Division Unit 2
Share objects into equal groups and describe remainders	Division Unit 2

F / K

Skip-count backwards by 10	Pre-warm up and warm-down songs and games
Share objects equally between 2 people	Division Unit 1

Division Skills and Strategies Staircase

Year 6

- Calculates averages
- Divide decimals by 1-digit
- Uses the multiply to divide strategy on paper to divide by 2-digits
- Uses their preferred strategy to solve complex worded problems and divisions of up to 4-digits by 1-digit
- Fluently uses all fact families to divide (including 7s)

Year 5

- Represents remainders as fractions and decimals
- Recognises the 3 notations that represent division
- Divides 3-digits by 1-digit using the short or long division algorithm
- Divides 3-digits by 1-digit using mental strategies (partitioning into place values, multiplying tens to get close to the total)
- Fluently reverses the 6 and 9 times tables to divide

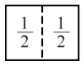
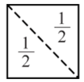
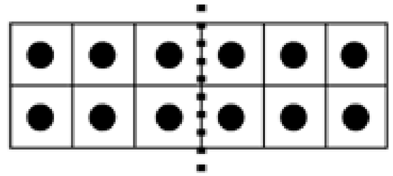
Year 4

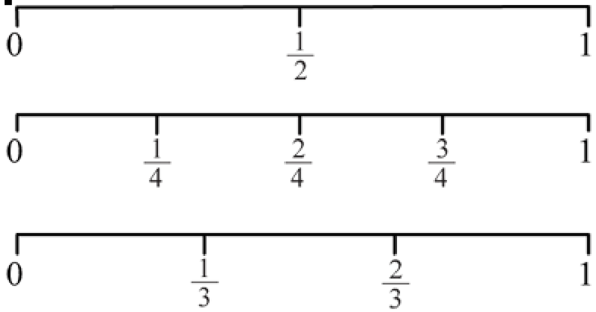
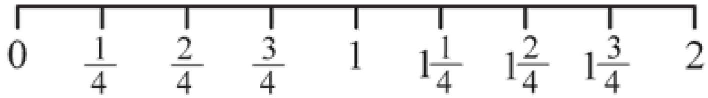
- Estimates 3- and 4-digit answers to divisions using rounding and multiplying tens and hundreds to divide strategy
- Uses times tables to solve near fact families, e.g. 25 ÷ 4, thinks 4 x 6 = 24 so 4 x 6 + 1 = 25, so it is 6 r 1
- Use fact families to solve and justify answers to divisions
- Explains and uses divisibility patterns for the 4s and 8s (as well as 10, 5, 2 and 3)
- Fluently reverses the 8 times tables strategy to divide (half half half)
- Fluently reverses the 4 times tables strategy to divide (half half)

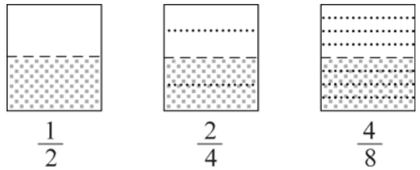
Years 3-6 Division

Critical Checkpoints for Fractions and Decimals

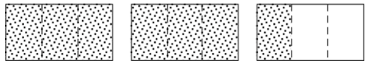
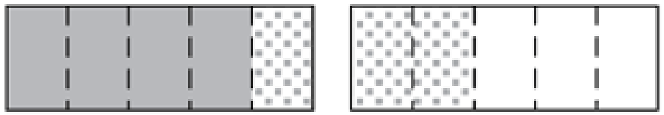
The big goals, by the end of the unit, are that all students in this year level can:

First Year of school	**Use 'out of' language** e.g. 2 out of 3 of the students at the front are girls		
	Know their ordinal numbers to at least 10		
Year 1	**Describe two equal parts of a whole as two halves** explains when something is not half and why	**Use fraction notation for halves, understanding this as 1 out of 2 parts**  	**Solve half of collections** 
Year 2	**Identify and make quarters and eighths of shapes** (including rectangles and circles) Strategy: Cut in half, then half (for quarters), then half again (for eighths) Use fraction notation for quarters and eighths $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$	**Solve quarters and eighths of collections** Strategy: Split the whole collection in half, then half (for quarters), then half again (for eighths)	Compare halves, quarters and eighths, e.g. $\frac{1}{8}$ is less than $\frac{1}{4}$ because it is 1 out of 8 parts, instead of 1 out of 4 e.g. $\frac{1}{2}$ is more than $\frac{1}{4}$ because it is 1 out of 2 parts, rather than 1 out of 4 parts
Year 3	**Identify and make thirds and fifths** (as well as halves, quarters and eighths) **with any numerator** e.g. creates 2/3 or 3/5 of a shape	**Recognise equivalence to one whole,** e.g. 5 out of 5 parts makes one whole, **rename** $\frac{2}{2}$ $\frac{3}{3}$ $\frac{4}{4}$ $\frac{5}{5}$ $\frac{8}{8}$ **as 1**	**Count by halves, thirds and quarters**

Year 3	**Place halves, thirds and quarters on number lines** 	**Place mixed numerals that include halves, thirds and quarters on number lines:** 

Year 4 Fractions	**Identify and make fractions with denominators of 2, 4, 8; 3 and <u>6</u>; 5, <u>10</u> and <u>100</u>** (underlined are the new content introduced)	**Identify equivalent fractions with related denominators** (halves with quarters and eighths; thirds with sixths; fifths with tenths) 	**Connect fractions to tenths and hundredths** Understand that $\frac{1}{10}$ is the same as 0.1 because both show 1 out of 10 parts (1 out of 10 parts of $1) $\frac{1}{100}$ is the same as 0.01 because both show 1 out of 100 parts (1 out of 100 parts of $1)

Year 4 Decimals	**Represent decimals as money** Understanding the wholes as dollars and parts as cents, separated by the decimal point. Show money in decimal and fraction notation, e.g. $5.35 as 5 whole dollars and 35 out of 100 cents: $5\frac{35}{100}$ or 5 wholes, 3 ten cents (tenths) and 5 single cents (hundredths): $5 + \frac{3}{10} + \frac{5}{100}$	**Represent decimals as measurements** Understanding wholes as metres and parts as centimetres, separated by the decimal point e.g. 123cm = 1.23m e.g. 140cm = 1.40m = 1.4m (zeroes at the end do not change the value)

<table>
<tr>
<td rowspan="2">Year 5</td>
<td>Compare unit fractions (numerators of 1) with denominators of 5, 6, 8, 10 and 12 (as well as 2, 3, 4), places all on a number line (with a numerator of 1)</td>
<td>Convert between improper and mixed fractions
$\frac{7}{3}$  $2\frac{1}{3}$</td>
<td>Compare, order and place decimals of up to 3 places on number lines from 0 to 1</td>
</tr>
<tr>
<td colspan="2">Add and subtract fractions (including worded problems) with the same denominator, including where the result is an improper fraction or mixed numeral
$\frac{4}{5} + \frac{3}{5} = \frac{7}{5} = 1\frac{2}{5}$
</td>
<td>Add mixed numerals with the same denominator
$2\frac{1}{5} + 1\frac{2}{5} = 3\frac{3}{5}$</td>
</tr>
<tr>
<td>Year 6 Fractions</td>
<td>Compare and order fractions (<u>any</u> numerator) with related denominators (for denominators of 2-6, 8, 10, 12 and 100)</td>
<td>Add and subtract fractions with <u>related</u> denominators (e.g. 3, 6, 12;
2, 4, 8;
5, 10, 100)</td>
<td>Find equivalence and simplify fractions by multiplying or dividing the numerator and denominator by the same number</td>
</tr>
</table>

<table>
<tr>
<td rowspan="2">Year 6 Converting between fractions, decimals and percentages</td>
<td colspan="2">Solve a fraction and percentage (10%, 25%, 50%) of a collection, connecting this to division

e.g. to work out $\frac{3}{8}$ of 40, I divided by 8 (half half half), then multiplied by 3

e.g. to work out 25%, I halved it twice</td>
<td colspan="2">Convert between fractions, decimals and percentages

'25% means 25 out of 100 or $\frac{1}{4}$ or 0.25'

75%, 0.75, $\frac{3}{4}$

$1.37 = 137\% = \frac{137}{100} = 1\frac{37}{100}$</td>
</tr>
<tr>
<td>Year 6 Operating with decimals (also mentioned in previous units)</td>
</tr>
</table>

Year 6 Operating with decimals (also mentioned in previous units)	**Add or subtract decimals to 3 places, first estimating the answer by rounding to the nearest whole number**	**Multiply decimals by whole numbers**	**Divide decimals by 1-digit whole numbers**

Fractions and Decimals Skills and Strategies Staircase

Represent decimals as money and measurement, converting between fraction and decimal notation with a focus on ‘out of 100’

Connect fractions to tenths and hundredths (out of 10, out of 100)

Identify equivalence for related denominators

Year 4

Identify and make fractions with denominators of 6, 10 and 100 (in addition to 2, 4, 8, 3 and 5)

Place mixed numerals on number lines that go above 1 (related to halves, thirds and quarters)

Years 3-6 Fractions Unit

Year 3

Place halves, thirds and quarters on number lines (any numerator)

Count by halves, thirds and quarters

Recognise equivalence to one whole (5 fifths makes one whole, $\frac{3}{3}$ makes one whole) — **Fractions Unit 3**

Identify and make thirds and fifths — **Fractions Unit 3**

Compare one half, one quarter and one eighth (numerators of 1) — **Fractions Unit 2**

Year 2

Create quarters and eighths of collections — **Fractions Unit 2**

Create quarters (half of half) and eighths (half of half of half) of shapes — **Fractions Unit 2**

Solve half of collections — **Fractions Unit 2**

Year 1

Use fraction notation to represent half $\frac{1}{2}$ — **Fractions Unit 2**

F / K

Understand half as two equal parts of one whole and create half of shapes — **New Early Years Pack Fractions Unit 2**

Use ‘out of’ language — **New Early Years Pack Fractions Unit 1**

Know the ordinal forms of numbers to 10 — **New Early Years Pack Place Value Unit 10**

Fractions and Decimals Skills and Strategies Staircase

Year 6

Multiply and divide decimals by whole numbers

Add and subtract up to 3 decimal places

Convert between fractions, decimals and percentages

Solve a fraction and percentage of a collection by connecting this process to division

Add and subtract fractions with related denominators (2/6 + 3/12)

Find equivalence and simplify by multiplying or dividing the numerator and denominator by the same number

Compare fractions with related denominators (any numerator), e.g. 4/5 v. 7/10

Compare decimals to 3 places

Years 3-6 Fractions

Year 5

Add mixed numerals with the same denominator

Add and subtract fractions with the same denominator, including worded problems

Convert between improper and mixed fractions

Compare unit fractions (numerator of 1) and place on number lines (denominators of 10, 100 and 12; as well as 2, 4, 8; 3, 6; 5)

Critical Checkpoints for Patterns and Algebra

Note: **Many of these checkpoints overlap with *Multiplication*.**

The big goals, by the end of the unit, are that all students in this year level can:

<table>
<tr><td rowspan="3">First Year of School</td><td>Sort objects in different ways and explain the categories they used to classify each collection</td><td colspan="2">Continue and create AB and similar patterns with objects (shapes, counters), sounds (claps), actions (stomps)</td></tr>
<tr><td colspan="3">Understands that a pattern must repeat</td></tr>
<tr><td colspan="3">Skip-count by 10 from zero</td></tr>
<tr><td rowspan="2">Year 1</td><td>Continue and create ABC, ABB, ABBC patterns or similar with objects, sounds and actions</td><td>Solve patterns counting by ones up to and back from 120</td><td>Skip-count by 5 up to 120 and backwards</td></tr>
<tr><td>Skip-count by 2 up to 120 and backwards</td><td colspan="2">Continue, create and describe the rules for patterns that increase or decrease by 10, 5 or 2</td></tr>
<tr><td>Year 2</td><td>Solve a missing number in the middle of a pattern and explain how they did it,
e.g. 3, 7, 11, __, 19, 23, 27</td><td>Solve missing parts in addition and subtraction problems
$5 + \square = 13$ $15 - \square = 9$</td><td>Skip-count by 10, 5, 2 and 3 from any 2-digit number</td></tr>
</table>

<table>
<tr><td>Year 3</td><td colspan="2">Continue, create and describe the rules for patterns that increase or decrease by 3, 4, 6, 7, 8 and 9</td><td>Identify the pattern for odd/even, identify whether a number of any size is odd or even</td></tr>
<tr><td rowspan="2">Year 4</td><td>Solve missing parts in 2-digit addition and subtraction problems
$\square + 55 = 83, \ \square - 15 = 19$</td><td>Solve $8 + \square = 6 + 7$ missing parts involving two operations in the number sentence</td><td>Continue, create and describe patterns that use multiplication,
e.g. determine the next term in the pattern 4, 8, 16, 32, 64, …</td></tr>
<tr><td>Find missing numbers in multiplication and division number sentences
$28 = \square \times 7, \ 40 \div \square = 5$</td><td colspan="2">Write multiplication and division number sentences to represent worded problems

e.g. 'I buy six pens and the total cost is $24. What is the cost of each pen?' can be represented as $6 \times \square = 24$
$6 \times \square = 24$ or $24 \div 6 = \square$</td></tr>
<tr><td>Year 5</td><td>Use the inverse operation to solve number sentences for division of larger numbers (multiply to divide strategy) for 1-digit divisors
$125 \div 5 = \square$ becomes $\square \times 5 = 125$</td><td>Solve missing parts involving two operations, one of which includes multiplication or division
$5 \times \square = 4 \times 10, 5 \times \square = 30 - 10$</td><td>Write number sentences to match and solve worded problems
e.g. “I am thinking of a number that when I double it and add 5 it is 13. What is the number?”</td></tr>
</table>

<table>
<tr>
<td rowspan="3">Year 6</td>
<td>Continue, create and describe patterns involving fractions and decimals
e.g. $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \ldots$ or 1.25, 2.5, 5, ...</td>
<td>Use a table of values for geometric and number patterns to record and solve values of a large position number in the pattern
e.g. how many matches will you need to make 100 squares?
□ , □□ , □□□ , □□□□ , …
<table>
<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>
The pattern is multiplying by 4, so you will need 400 matches to make 100 squares</td>
</tr>
<tr>
<td colspan="2">Recognise that if you carry out two inverse operations, the effect is nil (multiply and then divide by 3; add 3 and later subtract 3)</td>
</tr>
<tr>
<td colspan="2">Plot points on the Cartesian Plane in all 4 quadrants</td>
</tr>
</table>