Mental Computation Calculate Scope and Sequence

Skill	Kindy	Pre-Primary	Year 1
Counting	Counting forwards and backwards to and from 20 from any starting point. Subitising: recognising how much in a collection without counting (standard to 6) More and Less – e.g. which collection is <u>more than</u> and which collection is <u>less than</u>. Which collection is the <u>same</u>? (Collections to 10) Before and After: Focus on the number before and after a given number.	Counting forwards and backwards to and from 20 from any starting point. Exposure to skip counting forwards by 2s, 5s and 10s Subitising: recognising how much in a collection without counting (standard and non-standard to 6 and beyond) Use counting on to solve addition problems. Identifying the biggest number and counting on. More or Less – identify the number that is <u>less than</u> and the number that is <u>more than.</u> (1 -120 and beyond) Before and After a given number e.g. _____, 55, _____	Count forwards and backwards to and from 110 from any starting point. Skip count forwards and backwards by 2s, 5s and 10s – 10, 20, 30 etc. Skip count forwards and backwards from 2s,5s and 10s from any number 45,55,65 etc. Use counting on to solve addition problems Use counting back to solve subtraction problems
Partitioning	Standard partitioning to 6 and beyond	Partitioning to 10 and beyond Identifying a pattern to assist in subitising a collection e.g. 6 and 2 more make 8.	Standard partitioning to 20 and beyond. Use standard partitioning to add two digit numbers? Use non- standard partitioning up to 20 e.g.: 17+3, 12+8
Addition and Subtraction	Matches number names to numerals up to 10 (including 0) Matches number names (orally and in order) to small collections to 10 and beyond (including 0) Matches the numerals to small collections of objects to 10 and beyond (including 0)	Basic addition number facts to 10. e.g. 2+5=	Basic addition facts to 10 – 2+5, 8+2 to an automatic level Basic subtraction facts to 10 – 9-3, 8-4 to an automatics Level
Compatible Numbers			Basic addition facts to 10 and 20 and their turn around facts. Compatible numbers to 10 - 7+3, 3+7 = 10 Compatible numbers to 20 - 17+3, 3+17 = 20
Bridging			Bridge to 10 – 9+4 = (9+1) +3

Compensate (Partition and Rearrange)		More and less connected to addition and subtraction and counting on and back from any given number.	Compensate to add numbers to 10 and beyond by borrowing from one number to give to another. This involves adding or subtracting from a number to make a friendly number. e.g.: 8+7 = 8+2+5= 10+5 12-7= 10-7+2=
Doubling and Halving	Halving - shares a collection (up to 6 items) into 2 equal parts.	Double numbers to 10 and beyond e.g. 5 +5, 2+2 Halving a collection e.g. 10 animals shared between two enclosures.	Double numbers to 10 and beyond (20) Use near doubles to solve problems using single digit numbers Halving numbers to 10 and beyond (20).
Multiplication and Division	Sharing a collection (up to 6 items) into 2 equal parts	Sharing a collection up to 20.	**Not a mental Maths focus until Year Three**
For pedagogical support and strategies refer to FSiM Calculate background notes (P 189-195) and Tackling Tables (Paul Swan) **Please note that these concepts and skills are to be taught explicitly using "Best practice" strategies within the content of your year level mathematics programs. These skills are then consolidated through daily short application sessions, as per Whole School Numeracy Plan.**			

Skill	Year 2	Year 3	Year 4
Counting	Count forwards and backwards to and from 1000 Skip count forwards and backwards by 2s,3s,5s and 10s – 10, 20, 30 etc. Skip count forwards and backwards from 2s,3s,5s and 10s from any number 45,55,65 etc. Use counting on to solve addition problems ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Counting forwards & backwards in 10s from any number	Count forwards and backwards to and from 10 000 Count forwards and backwards in multiples of 10 from any number – count in 20s,30s etc. Count forwards and backwards in 100s from any number ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Counting forwards & backwards in 10s from any number	Count by quarters, halves and thirds ***See Calculate Strategies – What do I teach*** ✓ Imagining a numberline
Partitioning	Standard partitioning to 100 Use standard partitioning to add two digit numbers, but add tens and then ones – i.e. 26+42 becomes (20+40)+(6+2) Non-standard partitioning, up to 20 – i.e. 17+ 3 ***See Calculate Strategies – What do I teach*** ✓ Partitioning numbers ✓ Compensate	Standard partitioning to 10000 Use standard partitioning to add three digit numbers, but add hundreds, then tens and then ones – i.e. 126+342 becomes (100+300)+ (20+40)+(6+2) Non-standard Partitioning to 100 ***See Calculate Strategies – What do I teach*** ✓ Partitioning numbers ✓ Compensate	Use standard partitioning to add three digit numbers **and beyond, as appropriate**, but add hundreds, then tens and then ones – i.e. 126+342 becomes (100+300)+ (20+40)+(6+2) ***See Calculate Strategies – What do I teach*** ✓ Partitioning numbers ✓ Compensate
Addition and Subtraction	Automatic recall of basic addition facts to maximum of 20 – 4+3,15+2 etc. Automatic recall of basic subtraction facts from total of 20 – 10-4,18-2 ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Changing subtraction to addition	Generalise basic facts to 20 to solve facts to 100 i.e. 120+80, use known fact of 12+8 ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Changing subtraction to addition	Build on previous facts and strategies to mentally add and subtract to 100 Consolidate basic addition facts and related subtractions and generalise to bigger numbers ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Changing subtraction to addition
Using Relationships	Changing subtraction to addition to solve a problem – for example 15-10 changes to 10+ □= 15	Changing subtraction to addition to solve a problem – for example 15-10 changes to 10+ □= 15	Changing subtraction to addition to solve a problem Use property of commutativity to solve addition problems using numbers to 10 000 – put biggest number first and then count on. For example: 470+1538= 1538+470

	Use property of commutativity to solve addition problems using numbers to 100 – put biggest number first and then count on. For example: 8+7+2=8+2+7=10+7 ***See Calculate Strategies – What do I teach*** ✓ Changing subtraction to addition ✓ Imagining a numberline ✓ Rearrange numbers ✓ Using compatible numbers	Use property of commutativity to solve addition problems using numbers to 1000 – put biggest number first and then count on. For example: 47+538= 538+47 ***See Calculate Strategies – What do I teach*** ✓ Changing subtraction to addition ✓ Imagining a numberline ✓ Rearrange numbers ✓ Using compatible numbers	***See Calculate Strategies – What do I teach*** ✓ Changing subtraction to addition ✓ Imagining a numberline ✓ Rearrange numbers ✓ Using compatible numbers	
Compatible Numbers	Compatible numbers to 10 – 7+3, 6+4 – all total 10 Compatible numbers to 20 – 17+3, 16+4 – all total 20 ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Using compatible numbers ✓ Rearrange numbers	Compatible numbers for all 10s numbers, including 100. For example, 80+20=100 ***See Calculate Strategies – What do I teach*** ✓ Basic addition facts ✓ Imagining a numberline ✓ Using compatible numbers ✓ Rearrange numbers		
Bridging	Bridge to 10 – 9+4 = (9+1)+3 ***See Calculate Strategies – What do I teach*** ✓ Using compatible numbers ✓ Imagining a numberline	Bridge to 100 – 68+47 = (68+32)+15=100+15 ***See Calculate Strategies – What do I teach*** ✓ Using compatible numbers ✓ Imagining a numberline		
Doubling and Halving	Double, numbers to 20 Use near doubles to solve problems to solve problems using single digit numbers Halving numbers to 20 ***See Calculate Strategies – What do I teach*** ✓ Double/ near doubles ✓ Basic addition facts ✓ Imagining a numberline	Doubles and near doubles, using numbers to 100 Double & Double, double Halving numbers to 100 ***See Calculate Strategies – What do I teach*** ✓ Double/ near doubles ✓ Basic addition facts ✓ Imagining a numberline	Consolidate doubles and near doubles, using bigger numbers and focussing on less common doubles – 38+38 Double & Double, double & Double, double, double Halving ***See Calculate Strategies – What do I teach*** ✓ Double/ near doubles ✓ Basic addition facts ✓ Imagining a numberline	
Multiplication facts	Automatics recall multiplication facts 2, 5 and 10 ***See Calculate Strategies – What do I teach*** ✓ Skip count by 2s, 5s, 10s ✓ Arrange collections ✓ Exploration of arrays ✓ Doubling	Automatic 1, recall multiplication facts 2,3 4, ,5 and 10 ***See Calculate Strategies – What do I teach*** ✓ Skip count by 2s, 5s, 10s ✓ Arrange collections ✓ Exploration of arrays ✓ Doubling & Double, double	Recall all multiplication facts to 10x10, in random sequence Multiply in parts ***See Calculate Strategies – What do I teach*** ✓ Arrange collections ✓ Exploration of arrays ✓ Doubling & Double, double & Double, double, double	

	Use property of commutativity to solve multiplication problems, order doesn't matter – i.e. 6 x 4 = 4 x 6 ***See Calculate Strategies – What do I teach*** ✓ Commutativity	Use property of commutativity to solve multiplication problems, order doesn't matter – i.e. 16 x 4 = 4 x 16 ***See Calculate Strategies – What do I teach*** ✓ Commutativity	Use property of commutativity to solve multiplication problems – i.e. 62 x 14 = 14 x 62 ***See Calculate Strategies – What do I teach*** ✓ Commutativity
Division facts		Use inverse relationships, between division and multiplication (Four Families) – 2x8, 8x2, 16÷2, 16÷8 ***See Calculate Strategies – What do I teach*** ✓ Arrange collections ✓ Exploration of arrays ✓ Halving & halving, halving ✓ Commutativity	Use inverse relationships, between division and multiplication (Four Families) – 2x8, 8x2, 16÷2, 16÷8 Recall all division facts to 100, in random sequence ***See Calculate Strategies – What do I teach*** ✓ Arrange collections ✓ Exploration of arrays ✓ Halving & halving, halving ✓ Commutativity
For pedagogical support and strategies refer to FSiM Calculate background notes (P 189-195) and Tackling Tables (Paul Swan) **Please note that these concepts and skills are to be taught explicitly using "Best practice" strategies within the content of your year level mathematics programs. These skills are then consolidated through daily short application sessions, as per Whole School Numeracy Plan.**			

Skill	Year 4	Year 5	Year 6
Counting	Count by quarters, halves and thirds	Count by quarters, halves and thirds. Count by tenths, hundredths.	Count by tenths, hundredths. Count by tenths, hundredths and thousandths.
Partitioning	Use standard partitioning to add three digit numbers **and beyond, as appropriate**, but add hundreds, then tens and then ones – i.e. 126+342 becomes (100+300)+ (20+40)+(6+2) Use partitioning to resolve multiplication and division examples	Use standard partitioning to add three digit numbers **and beyond, as appropriate**, but add hundreds, then tens and then ones – i.e. 126+342 becomes (100+300)+ (20+40)+(6+2) Front Loading (Standard Partitioning) E.g.: 24 + 37 = 20 + 30 + 4 + 7 Non – standard partitioning E.g.: 39 – 17 = 19 – 17 + 20 Use partitioning to resolve multiplication and division examples	Use standard partitioning to add three digit numbers **and beyond, as appropriate**, but add hundreds, then tens and then ones – i.e. 126+342 becomes (100+300)+ (20+40)+(6+2) Front Loading (Standard Partitioning) E.g.: 24 + 37 = 20 + 30 + 4 + 7 Non – standard partitioning E.g.: 39 – 17 = 19 – 17 + 20 Use partitioning to resolve multiplication and division examples
Addition and Subtraction	Build on previous facts and strategies to mentally add and subtract to 100 Consolidate basic addition facts and related subtractions and generalise to bigger numbers Apply basic addition and subtraction knowledge to multiples of 10, 100, 1000	Use known addition and subtractions facts to work out those that they do not know. Extend basic facts which they do know using patterns. Use rounding to question reasonableness of answers. Apply basic addition and subtraction knowledge to multiples of 10, 100, 1000	Use known addition and subtractions facts to work out those that they do not know. Extend basic facts which they do know using patterns. Use rounding to question reasonableness of answers. Apply basic addition and subtraction knowledge to multiples of 10, 100, 1000
Using Relationships	Changing subtraction to addition to solve a problem Use property of commutatively to solve addition problems using numbers to 1000 – put biggest number first and then count on. For example: 47 + 538 = 538 + 47	Change a subtraction to an addition to solve a problem. Use property of commutatively to solve addition problems using numbers to 1000 – put biggest number first and then count on. For example: 47 + 538 = 538 + 47	Change a subtraction to an addition to solve a problem. Use property of commutatively to solve addition problems using numbers to 1000 – put biggest number first and then count on. For example: 47 + 538 = 538 + 47
Compatible Numbers	Compatible numbers for all 10s numbers, including 100. For example, 80+20=100 Use build to any 10s number including 100 to bridge 10	Compatible numbers for all 10s numbers, including 100. For example, 80+20=100 Use build to any 10s number including 100 to bridge 10	Compatible numbers for all 10s numbers, including 100. For example, 80+20=100 Use build to any 10s number including 100 to bridge 10
Bridging	Bridge to 100 – 68+47 = (68+32)+15=100+15	Bridge to 100 or 1000	Bridge to 100 or 1000

		E.g.: 68+47 = (68+32)+15=100+15	E.g.: 68+47 = (68+32)+15=100+15
			Apply the above to decimals
			E.g.: 0.68 + 0.47 = 0.68 + 0.32 + 0.15 = 1.15
Doubling and Halving	Consolidate doubles and near doubles, using bigger numbers and focussing on less common doubles – 38+38 etc Double, double, double Halving	X 2 is double X 4 is double double X 8 double double double Double one number and halve the other. E.g.: 18 x 5 = 9 x 10 Near doubles. E.g.: 9 + 9 = 10 + 10 - 1 – 1=	X 2 is double X 4 is double double X 8 double double double Double one number and halve the other. E.g.: 18 x 5 = 9 x 10 E.g.: 9 + 9 = 10 + 10 - 1 – 1=
Multiplication and Division	Recall all multiplication facts to 10x10, in random sequence Use property of commutatively to solve multiplication problems – ie 6x4 = 4x6 Use inverse relationships, between division and multiplication (Four Families) – 2x8, 8x2, 16÷2, 16÷8 Recall all division facts to 100, in random sequence Use a known multiplication fact to solve division problem Multiply in parts Inverse relationship	Use factors to multiply. Take a factor from one and give to another. E.g.: 18 x 5 = 3 x (6 x 5) or (5 x 6) x 3 Use inverse relationships, between division and multiplication (Four Families) – 2x8, 8x2, 16÷2, 16÷8 Use a known multiplication fact to solve division problem Multiply in parts. Extend basic multiplication facts to multiply by 10, 100, 100 E.g.: 30 x 40 = 3 x 4 x 100 Rounding a number 39 x 3 = 40 x 3 - 3	Use factors to multiply. E.g.: 6 x 36 = (2 x 3) x (9 x 4) Use inverse relationships, between division and multiplication (Four Families) – 2x8, 8x2, 16÷2, 16÷8 Use a known multiplication fact to solve division problem Multiply in parts. Change the numbers by multiplying or dividing by the same amount. E.g.: 18 x 8 = (18 ÷ 2) x (8 ÷2) = 9 x 4 x 2 x 2 = Extend basic multiplication facts to multiply by 10, 100 Divide by 10, 100 and apply to decimals E.g.: 150 ÷10 = 15 and 15 ÷10 = 1.5 and 15 ÷ 100 = 0.15 Rounding a number 39 x 3 = 40 x 3 - 3

For pedagogical support and strategies refer to FSiM Calculate background notes (P 189-195) and Tackling Tables (Paul Swan)
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Number and Place Value Sequence

KINDY	Pre-Primary	Year One
Establish understanding of the language and processes of counting by naming numbers in sequence, initially to and from ten moving from any starting point.	*Establish understanding of the language and processes of counting by naming numbers in sequence, initially to and from twenty moving from any starting point.*	*Recognise, model, read, write and order numbers to 100. Locate these numbers on a number line*
Principle of The Count	**Principle of The Count**	- Students use ordinal numbers to represent position 1st, 2nd, and 3rd. - Students partition numbers to 100 using standard notation, 96 = 90 + 6. - Students compare and order numbers including the use of number lines. - Students recognise that numbers are made up of other numbers i.e. 10 can be 5 and 5. - Develop confidence with the number sequence, counting forwards and backwards in sequence from any starting point to 100. - Skip counting by 2, 5, & 10 starting from 0 to 100.

KINDY

Establish understanding of the language and processes of counting by naming numbers in sequence, initially to and from ten moving from any starting point.

Principle of The Count

1. Each object must be touched or included exactly once as the numbers are said.
2. The numbers must be said once and always in the same order.

Connect number names, numerals and quantities including zero, initially up to ten and then beyond.

Subitise small collections of objects.

- Subitises to six, standard formations.

Compare order and make correspondence between collections initially to ten and beyond.

Pre-Primary

Establish understanding of the language and processes of counting by naming numbers in sequence, initially to and from twenty moving from any starting point.

Principle of The Count

1. Each object must be touched or included exactly once as the numbers are said.
2. The numbers must be said once and always in the same order.
3. The objects can be touched in any order and the status point and order in which the objects are collected does not affect how many there are.
4. The arrangement of the objects does not affect how many there are.
5. The last number said says how many in the collection. It does not describe the last number touched.

Connect number names, numerals and quantities including zero initially up to ten and then beyond.

Subitise small collections of objects.

- Subitises to ten, standard and non-standard formations.

Compare order and make correspondence between collections initially to twenty and beyond.

Year One

Recognise, model, read, write and order numbers to 100. Locate these numbers on a number line

- Students use ordinal numbers to represent position 1st, 2nd, and 3rd.
- Students partition numbers to 100 using standard notation, 96 = 90 + 6.
- Students compare and order numbers including the use of number lines.
- Students recognise that numbers are made up of other numbers i.e. 10 can be 5 and 5.
- Develop confidence with the number sequence, counting forwards and backwards in sequence from any starting point to 100.
- Skip counting by 2, 5, & 10 starting from 0 to 100.

Year Two	Year Three	Year Four
Recognise, model, represent and order numbers to at least 1000.	*Recognise, model, represent and order numbers to at least 10,000.*	*Recognise, represent and order numbers to at least 10,000.*
- Students use ordinal numbers to indicate position to 10. - Students partition numbers with standard notation up to 1000 i.e. 986 = 900+80+6. - Students read, write and say numbers to 1000. - Students compare and order numbers, including the use of number lines.	- Students read, write and use ordinal numbers to 20. - Students name the place value of numbers to 10,000. - Students partition numbers into standard notation to 10,000 i.e. 9476 = 9000+400+70+6. - Compare and order numbers < >. - Students classify numbers as odd or even.	*Partition numbers to 10,000 using standard and non-standard notation.* *Compare and order numbers using < >.* *Recognise patterns in numbers i.e. 1-9 sequence, 10, 100, 1000.* *Round numbers to the nearest 10, 100, 1000.* *Use the approximation symbol ≈.* *Students name the place value of numbers to 10,000.* - Students recognise prime and composite numbers. - Recognise and generate multiples and factors.

Year Five	Year Six
Recognise, represent and order numbers to at least 1000 000s.	*Recognise, represent and order numbers to 10 million.*
- Partition numbers to 1000 000 using standard and non-standard notation. - Compare and order numbers using < > = ≠ - Round numbers to the nearest 10, 100, 1000. - Students name the place value of numbers to 1000 000. - Students recognise prime and composite numbers. - Recognise and generate multiples and factors. *Use of integers (negative numbers)*	- Partition numbers to 10 million using standard notation. - Compare and order numbers using < >. - Round numbers to the nearest 10,100,1000. - Use the approximation symbol ≈. - Students recognise the properties of prime and composite numbers. - Recognise and generate multiples and factors. - Students name the place value of numbers to any number. - Students use = and ≠, < and > symbols to order and compare numbers and numerical sentences. - Square and triangular numbers

Addition and Subtraction Sequence

KINDY	Pre-Primary	Year One

Students recognise addition is putting things together and subtraction is taking things away.	*Represent and solve simple addition and subtraction problems using a range of strategies including counting and re-arranging parts.*
	
	• Students represent stories with materials, pictures, symbols and number sentences.
	• Solve one step problems with single digits (+ -).
		Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and re-arranging parts using doubling and friends of 10.
		
		• Students represent number stories in materials, pictures, symbols and number sentences.
		• Recognises the relationship between addition and subtraction.
		• Solves one step word problems involving addition and subtraction.
		• Addition of more than two digits;
		    1 digit plus 1 digit
		    1 digit plus 2 digits
		    2 digits plus 2 digits
		    1 digit plus 1 digit plus 1 digit
		3+4+6=

Year Two	Year Three	Year Four
Solve simple addition and subtraction problems using a range of efficient mental and written strategies.	Solve simple addition and subtraction sums with regrouping up to 10 000.	*Apply place value to partition, numerals and regroup numbers to at least 10,000 to assist calculation and solve problems.*

Year Two

Solve simple addition and subtraction problems using a range of efficient mental and written strategies.

- Recognise the symbols to represent addition and subtraction.
- Write number sentences with symbolic representation i.e. 3 + 6 = 9.
- Solve addition and subtraction sums with numbers up to 99 (no regrouping).

```
  27        34        38        34
-  2     +  2      -  7      - 13
```

- Solve two step word problems with addition and subtraction.
- Recognise addition and subtractions can be described in everyday language.
- Addition of more than two digits. 3+4+6=

Year Three

Solve simple addition and subtraction sums with regrouping up to 10 000.

- Use standard algorithms for addition and subtraction including regrouping.
- Complete addition and subtraction sums with up to four digits.

```
  28        34        87       126      2745
+ 11      + 16      + 34     + 187     +3496

  34        43        44       321      6714
- 12      -  9      - 29     - 148     -3159
```

- Solve two step word problems involving addition and subtraction.

Recognise and explain the connection between addition and subtraction.

- Recognises addition and subtraction can be described with every day terms.
- Students recognises that;
  - Use part-part whole diagrams to represent addition and subtraction sentences
  - Subtraction is the inverse of addition.
  - Addition can be performed in any order.
  - Subtraction cannot be turned around.

Year Four

Apply place value to partition, numerals and regroup numbers to at least 10,000 to assist calculation and solve problems.

- Use standard algorithms for addition and subtraction including regrouping.
- Complete addition and subtraction sums with up to four digits.

```
   126      3 426      8 909
+  187    + 1 895    + 4 194

   493      4 372     14 328
-  184    - 1 804    - 5 489
```

- Solve two step word problems.
- Recognise addition and subtraction can be described with everyday terms e.g. add, take
- Solve simple calculations using decimal for money and measures.
- Students use strategies to check results of calculations including:

		- Approximating answers (reasonableness)
		- Rounding Numbers
		- Checking results against context of question.
		• Recognises that;
		  - Use part-part-whole diagrams to represent addition and subtraction sentences.
		  - Subtraction is the inverse of addition.
		  - Addition can be performed in any order.
		  -Subtraction cannot be turned around.

Year Five	Year Six

• Solve addition and subtraction problems with numbers into 1000 000s including numbers with two decimal places such as money and measures.
• Include examples with unequal extension of decimals i.e.
 	
       34.7   128.9
    + 28.91   - 38.87
 	
• Solve problems with multiple steps that require the use of more than one operation, up to and including all four operations
• Recognise inverse relationships for and between addition, subtraction, multiplication and division
• Students write number sentences to represent different types of addition and subtraction (change, combine, equalise, compare).
• Students use strategies to check results of their calculations:
   - Using calculators.
   - Estimating and approximating.
   - Rounding to the nearest 10,100, 1000.
   - Rounding decimals.
   - Checking answers against reasonableness of the context of the problem.
	• Solve addition and subtraction problems for any number up to 10 million and up to 3 decimal places.
	• Solve problems with multiple steps that require the use of more than one operation, up to and including all four operations
	• Recognise inverse relationships for and between addition, subtraction, multiplication and division
	• Students write number sentences to represent different types of addition and subtraction (change, combine, equalise, compare).
	• Students use strategies to check results of their calculations:
	   - Using calculators.
	   - Estimating and approximating.
	   - Rounding to the nearest 10,100,1000.
	   - Rounding decimals.
	   - Checking answers against reasonableness of the context of the problem.

Multiplications and Division Sequence

Kindy/Pre Primary /Year One	Year Two	Year Three

Represent practical situations to model sharing.
 	
• Identify a fair share
• Share quantities into two groups
• Share quantities into multiple groups
	Recognise and represent multiplication as repeated addition, groups and arrays.
	
	• Represent groups and arrays as number sentences.
	• Recognise the symbol for multiplication.
	
	Recognise and represent division as grouping into equal sets and solve simple problems using these representations.
	
	• Recognise that some collections can be shared evenly some and some collections will have left overs.
	
	• Recognise division can be used in situations using sharing or partitioning collections.
	• Recognise that some collections can be shared evenly same and some collections will have left overs.
	• Solve one step problems using multiplication and division
	    • Using drawings and diagrams
	    • Using calculate and mental strategies
	• Recognise multiplication and division can be described in everyday language.
		Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies.
		
		• Complete multiplication algorithms up to three digits by one digit
		    • Using drawings and diagrams
		    • Using calculate and mental strategies
		    • Using knowledge of multiplication facts (2,3 ,4, 5, 6)
		
		$6 \times 3 = 18$ $\begin{array}{r} 6 \\ \times\ 3 \\ \hline 18 \end{array}$ $\begin{array}{r} 16 \\ \times\ 3 \\ \hline 48 \end{array}$ $\begin{array}{r} 148 \\ \times\ 4 \\ \hline 592 \end{array}$
		
		• Solve two step word problems that may include the three operations (+,-,x).
		• Use the term product.
		• Students recognise:
		• Multiplication can be used for situations involving repeated equal quantities.
		• The numbers in multiplications refer to either the number in the groups or the number of groups.
		• Recognise and represent division as grouping or sharing including representing division as a number sentence.
		• Students recognises:
		    • Collections can be shared evenly and some collections have left overs.
		    • Multiplication and division can be described in everyday language.
		    • Use the term product and remainders.
		    • Use symbols to represent division ÷
		    • Represents division problems with number sentences.

Year Four	Year Five	Year Six

Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and division (where there is no remainder).
 	
• Multiply four digits by one digit with regrouping.
• Multiply two digits by two digits with regrouping.
• Multiply three digits by three digits with regrouping.
• Divide two digit numbers by one digit.
• Divided three and four digit numbers by one digit.
 	
Solve word problems by using number sentences involving multiplication or divisions (where there is no remainder).
 	
• Solve two step word problems using multiplication and division.
• Solve multi-step problems using the four operations.
• Solve word problems using money and measure decimals.
• Students use strategies to check results of calculations including:
  - Approximating answers.
  - Rounding numbers.
  - Checking results against context of problems.
	Solve problems involving multiplication of large numbers by one and two digit numbers using efficient mental, written and appropriate digital strategies.
	
	• Multiply four digits by one digit with decimal numbers
	• Multiply two digits by two digits with decimal numbers
	• Multiply three digits by three digits with decimal numbers.
	• Write a standard algorithm
	
	Solve problems involving division by one-digit number, including those that result in a remainder.
	
	• Divide two digit numbers by one digit with remainders.
	• Divide three and four digit numbers by one digit with remainders.
	
	Use efficient mental and written strategies and apply appropriately.
	
	• Complete multi-step word problems using the four operations and applying knowledge of the order of operations (BIMDAS) and inverse relationships
	• Students use a calculator to multiply and divide.
	• Students use strategies to check results of calculations including:
	  - Approximating answers.
	  - Rounding numbers.
	  - Checking results against context of problems.
		Selects and applies efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations
		
		• Complete multiplication algorithms with any number including decimals to three decimal places.
		• Divide whole numbers and decimal by a single digit with a remainder calculated to two decimal places.
		• Solve multi-step word problems using all four operations and applying knowledge of the order of operations (BIMDAS) and inverse relationships
		• Students use strategies to check results of calculations including:
		  - Approximating answers.
		  - Rounding numbers.
		  - Checking results against context of problems.

Decimal Sequences

Year Two	Year Three	Year Four
• Students read written money amounts. • Students use the symbols $ and c.	• Students count and record small amounts of money using the decimal format i.e. $3.26. • Students read and write small money amounts	*Recognise that place value systems can be extended to tens and hundreds.* • Students partition numbers with two decimal places. • Students write and read numbers with decimal points. • Students use number lines to display decimal. • Students compare and order decimal numbers. *Students make the connection between fractions and decimals.* • Students recognise the conversion of decimals to fraction. 0.6 = 6/10 0.06 = 6/100 • Students recognise common fractions as decimals 1/2 = 0.5 1/4 = 0.25

Year Five	Year Six
Students recognise that the place value system can be extended beyond hundreds. • Students read and write numbers with decimals including money and measures. • Students identify the whole part and fractional part as measures. • Students partition decimal numbers to three places. • Students identify the place value of decimals to the thousands. *Students compare order and represent decimals.* • Compare and order decimalising < > and number lines. • Plot decimals on a number line	*Recognise that place value systems can be extended beyond thousands.* • Students read and write numbers with decimals including money and measures. • Students identify the whole part and fractional part as measures. • Students partition decimal numbers to three places. • Students identify the place value of decimals to the thousands. • Students round numbers to one or two decimal places. • Students write decimals or fractions. *Students compare order and represent decimals.* • Compare and order decimalising < > and number lines. *Make connections between fractions decimals and percentages.* • Students convert fractions to decimals, fractions to percentages and percentages to decimals and vice versa. • Order a mix of percentages, decimals and fractions and plot on a number line.

Fraction Sequences

Year One	Year Two	Year Three
Recognise and describe halves as all of two equal parts.	*Recognise and interpret common uses of halves, quarters and eighths of shapes and collections.*	*Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to complete a whole.*
• Students use the language of fractions – (a piece, part, share and half). • Share collections and objects into halves.	• Recognise a fraction as part of a whole • Understand the part-whole set, sub-set nature of fractions. • Share material, cut shapes and objects to represent fractions. • Use the terms denominator and numerator	• Recognise a whole can be portioned into a variety of fractional parts. • Understand the part-whole, set-sub set nature of fractions. • Compare and order fractions with like denominators. • Students recognise that half of a half is a quarter. • Students understand that cutting a whole into more parts or sharing a set into more groups makes each part/group smaller • Recognise the terms numerator, denominator and vinculum.

Year Four	Year Five	Year Six
Investigate equivalent fractions used in context.	*Compare and order common fractions and locate then on a number line.*	*Compare fractions with related denominators and locate and represent them on a number line.*
• Students identify equivalent fractions through ordering and comparing. • Students generate equivalent fractions for common unit fractions i.e. 1/2 2/4 3/6 4/8 5/10. • Students simplify common equivalent fractions to their simplest form, 4/8 = 2/4 = 1/2.	• Use < > to compare common fractions with the like denomination. • Use < > to compare common fractions with unlike denominators. • Know common equivalent fractions and convert fractions into their simplest form e.g. 25/100 = 1/4	• Compare fractions with like and unlike denominators using < > = • Students generate equivalent fractions for and given fractions. • Students imply common fractions.
Count by quarters, halves and thirds including mixed numerals. Collate and represent their fractions in a number line.	*Investigate strategies to solve problems recording the addition and subtraction of fractions with like denominators.*	*Solve problems involving addition and subtraction of fractions with the same or related denominators.*
• Students understand the concept of a mixed numeral. • Students recognise improper fractions and convert them to mixed numerals.	• Students solve addition and subtraction equations with fractions and mixed numerals with like denominators. • Recognise the terms numerator, denominator and vinculum.	• Students solve addition and subtraction equations with like denominator fractions and mixed numerals with like denominators. • Students solve simple addition and subtraction equations with related but unlike denominators. • Students calculate the newest common denominator to complete the equation.
Students read write and compare fractions. • Students recognise and write a wide range of common fractions i.e. 8/10 15/20 15/30. • Students order fractions on a number line. • Students compare fractions using < >. • Recognise the terms numerator, denominator and vinculum.	*Count by quarters, halves and thirds including mixed numerals. Collate and represent their fractions in a number line.* • Students understand the concept of a mixed numeral. • Students recognise improper fractions and convert them to mixed numerals. Students read write and compare fractions.	*Count by quarters, halves and thirds including mixed numerals. Locate and represent their fractions in a number line.* • Students understand the concept of a mixed numeral.

	- Students recognise and write a wide range of common fractions i.e. 8/10 15/20 15/30. - Students order fractions on a number line. - Students compare fractions using < >. - Recognise the terms numerator, denominator and vinculum. Students are able to find fractional amounts of things i.e. 2/3 of 9, 3/4 of 12 oranges.	- Students recognise improper fractions and convert them to mixed numerals Students are able to find fractional amounts of things i.e. 2/3 of 9, 3/4 of 12 oranges Students read write and compare fractions; - Students recognise and write a wide range of common fractions i.e. 8/10 15/20 15/30. - Students order fractions on a number line. - Students compare fractions using < >. - Recognise the terms numerator, denominator and vinculum. Students recognise the size of a fraction is relative to the size of the whole.

Data Representation Graphs and Tables Sequence

KINDY	Pre-Primary	Year One
• Answer simple Yes and No questions about picture graphs and column graphs • Make inferences about data displayed in picture graphs and column graphs	• Describe and interpret data displayed in picture graphs and column graphs • Answer questions and make inferences about the data represented in picture graphs and column graphs • Choose simple questions to gather data, represent data make simple inference about the data	• Describe and interpret data displayed in picture graphs and column graphs • Use standard tallies to record data • Answer questions and make inferences about the data represented in picture graphs and column graphs • Choose simple questions to gather data, represent data make simple inference about the data • Display data in lists and tables, describe and make inferences about the data

Year Two	Year Three	Year Four
• Describe and interpret data displayed in picture graphs and column graphs • Use standard tallies to record data • Answer questions and make inferences about the data represented in picture graphs and column graphs in include one step word problems. • Choose simple questions to gather data, represent data make simple inference about the data • Display data in lists and tables, describe and make inferences about the data	• Describe and interpret data displayed in picture graphs, line graphs and column graphs • Use standard tallies to record data • Answer questions and make inferences about the data represented in picture graphs and column graphs in include one step word problems. • Pose questions and develop surveys to gather data, represent data and make simple inference about the data. • Display data in lists and tables, describe and make inferences about the data including Carroll diagrams • Evaluate the effectiveness of various forms of data representation	• Describe and interpret data displayed in picture graphs, line graphs and column graphs • Use standard tallies to record data • Answer questions and make inferences about the data represented in picture graphs, line graphs and column graphs in include two step word problems. • Pose questions and develop surveys to gather data, represent data and make simple inference about the data. • Display data in lists and tables, describe and make inferences about the data including Carroll diagrams • Evaluate the effectiveness of various forms of data representation • Read scales on graph axis including when not all intervals are marked

Year Five	Year Six
• Describe and interpret data displayed in picture graphs, line graphs, column graphs pie graphs • Use standard tallies to record data • Answer questions and make inferences about the data represented in picture graphs, line graphs and column graphs in include two step word problems This should include graphic representations with unmarked and varied scales requiring inference and calculation to resolve questions. • Pose questions and develop surveys to gather data, represent data and make simple inference about the data. • Display data in lists and tables, describe and make inferences about the data including Carroll diagrams • Evaluate the effectiveness of various forms of data representation • Read scales on graph axis including when not all intervals are marked	• Describe and interpret data displayed in picture graphs, line graphs, column graphs pie graphs • Use standard tallies to record data • Answer questions and make inferences about the data represented in picture graphs, line graphs and column graphs in include two step word problems This should include graphic representations with unmarked and varied scales requiring inference and calculation to resolve questions. • Pose questions and develop surveys to gather data, represent data and make simple inference about the data. • Display data in lists and tables, describe and make inferences about the data including Carroll diagrams • Evaluate the effectiveness of various forms of data representation • Read scales on graph axis including when not all intervals are marked