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Content Clusters - Stage 1

Scope and sequencing by conceptual understanding

This is the scope… you create the sequence.

In this resource I provide possible ways of how groups of outcomes and their key ideas can be sequenced together based on the concepts they address. These are just examples and is not an exhaustive list of the clusters you can use to make connections across mathematics. I have used the syllabus outcomes, sub strands and the mathematics key ideas document. When teaching for conceptual understanding (not just the knowledge of each sub strand) we need to make clear how the pieces of the mathematical puzzle fit together. To do this, our planning needs to reflect this belief - that mathematics is a complex web of interrelated ideas. For ideas on what these links are, see my Linkages across the syllabus document on the resources section of our website.

The scope of what we teach is described in the syllabus (this is the constant), the sequence of what and how we teach mathematics is a decision for individual teachers (this is the variable). These clusters can be used to create meaningful sequences of learning that focus on concepts and programs that still address common sub strands (across grades or classes) but allow for individual teachers to add additional key ideas or focus on specific aspects of the cluster that students either have misconceptions around or are developing conceptual understanding in. The clusters are numbered but are not written in teaching order. These clusters may be added to or updated in the future and newer versions will be released.

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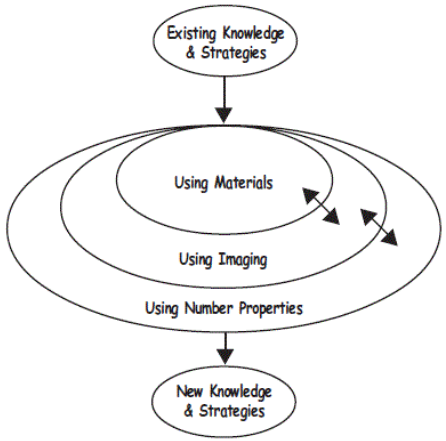
These clusters highlight the concept or main idea that ties each group of outcomes together, assisting teachers in making sense and meaning of the mathematics to students. When we think about the concepts or understandings first, we can think about what misconceptions students may have or what aspects of that concept they need next to connect their prior knowledge (the known) to create new knowledge (the unknown). The image to the right sourced from NZMaths, is based on Pirie and Kieren's growth in understanding model of the 'back and forth' nature of how students develop understanding from the known to the unknown.

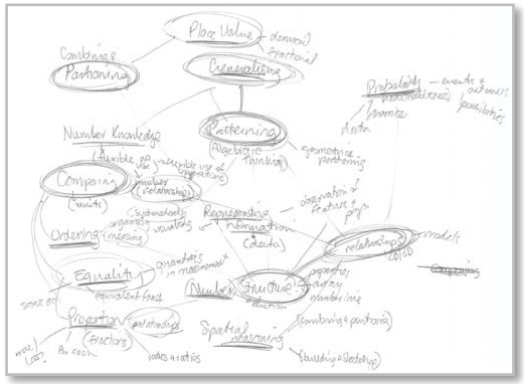


A (scope and) sequence should:

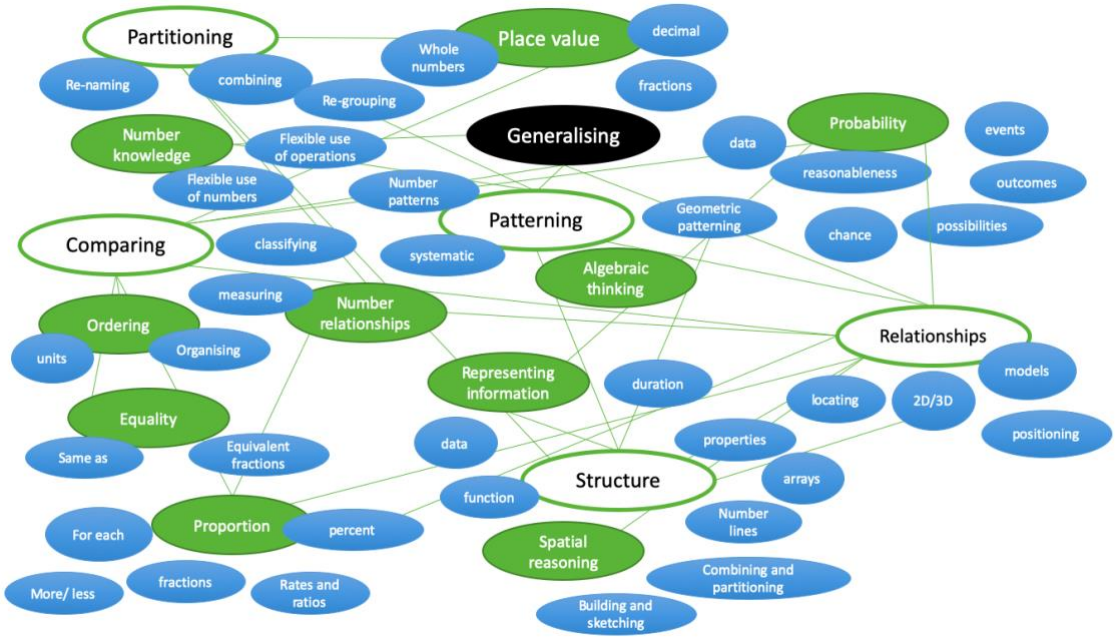
- reflect the conceptual needs of your students at this point in time (they need to be evaluated and changed constantly)
- show evidence of connections across sub strands
- address connected content strands that deal with similar concepts within a lesson or within a sequence of lessons (e.g. over a few weeks)
- give teachers an overarching structure to guide immediate planning
- where possible, be written to address the upcoming half- term or term teaching and learning cycle

NESA states that for their registration process as evidence of compliance schools need to provide "scope and sequence of learning/units of work in relation to outcomes of NESA syllabus for each KLA for each Year" (page 10). **Note:** Most schools have a set, wider grade or school-based scope and sequence, you can use the content clusters within those parameters to guide what conceptual understandings you focus on for your students. They show where you can make connections between the sub strands that are listed in the school's scope and sequence.

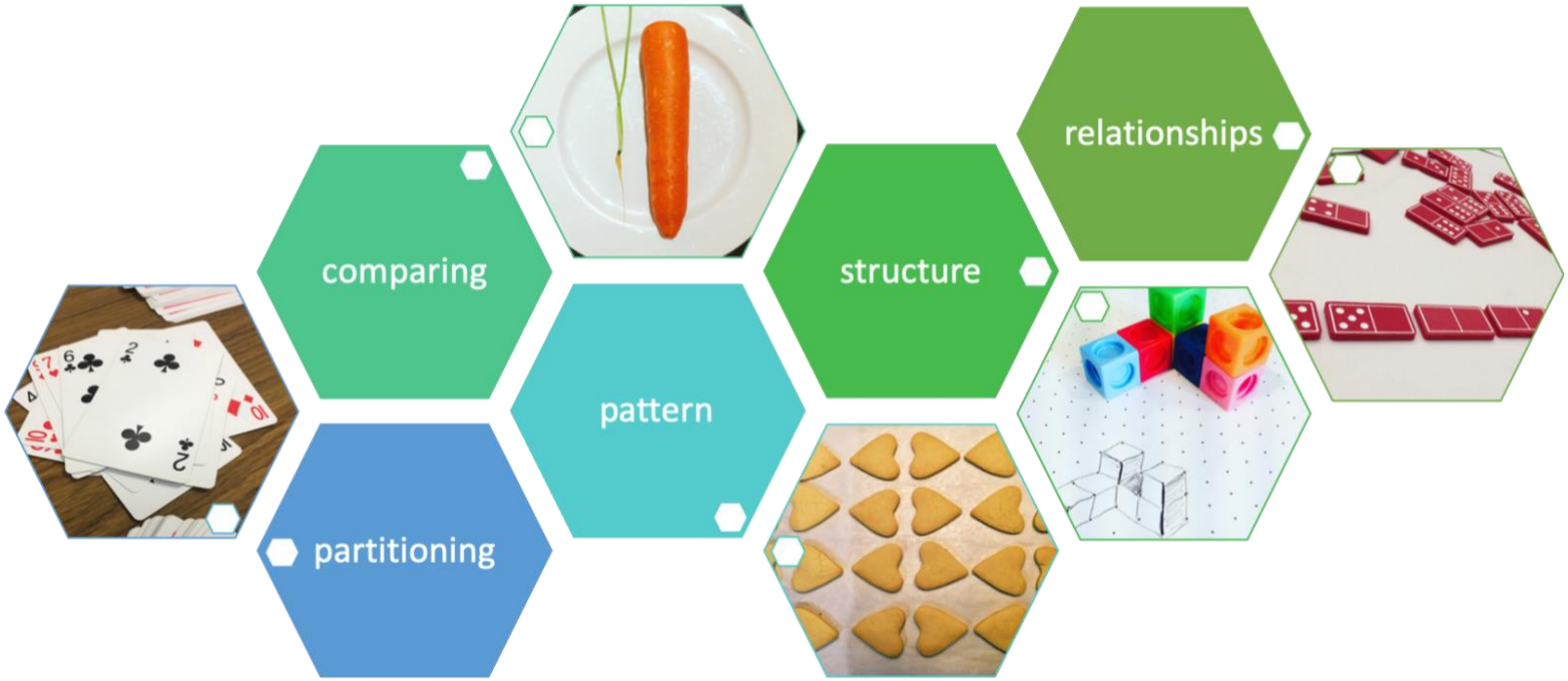
Mind map of big ideas and smaller concept connections



To assist with how these clusters fit into the larger picture of mathematics, what many researchers refer to as ‘Big ideas’ or important concepts (Askew, 2013; Boaler, 2017; Charles, 2005; Clarke, Clarke & Sullivan, 2012; Hurst & Hurrell, 2014; Siemon, Bleckly & Neal, 2012; Tout & Spithill, 2015), I had a go at thinking holistically about *“What are the main concepts or ‘knowledge actions’ students need?”* Here is my ‘messy’ thinking, then a more organised way of linking these ideas together are illustrated on the following pages.



Big ideas simplified



I then thought about these important concepts ‘big ideas’, the smaller ‘knowledge actions’ within them, and how the Content Clusters fit under each of these concepts, noting that some clusters align with more than one big idea.

Big ideas and smaller ‘knowledge actions’

Partitioning	Pattern	Comparing	Structure	Relationships
• Combining • Part-whole • Place value • Modelling • Whole numbers • Decimals • Fractions	• Geometric • Number • Algebraic • Generalising • Predicting	• Equality (with numbers and measurement) • Ordering • Proportion (fractions, percent, rates, ratios) • Magnitude • Estimating	• Number • Arrays • Shape • Measuring • Spatial • Building and sketching • Representing features (shape, data)	• Number • Additive and multiplicative • 2D and 3D • Probability • Possibilities (chance) • Data • Locating, positioning • Part-whole

These are just my ideas, Charles (2005) in his paper recognises that in developing deeper understanding of big ideas it might be helpful for teachers to “decide to modify or build your own” (p. 11). He also stated that:

> *“In working with colleagues on the development of this paper I am rather certain that it is not possible to get one set of Big Ideas and Understandings that all mathematicians and mathematics educators can agree on. Fortunately, I do not think it’s necessary to reach a consensus in this regard. Use the Big Mathematical Ideas and Understandings presented here as a starting point for the conversations they are intended to initiate” (p. 9)*

Organisation of Stage 1 clusters (updated)

In this update I have reduced the repetition of clusters and now simply have all the clusters included once (they are no longer repeated under substrand headings). A few clusters have been revised (Cluster 10 and 31) to add in other connections that have arisen. Where appropriate, clusters have been given the same or similar names as concepts from other Stages to help make connections, show concepts that develop, and to assist with multi-stage planning. This version also includes a visual overview of the clusters mapped to the NSW outcomes they address to assist with planning and programming. A list of cluster titles is also included so teachers can see 'at a glance' the types of concepts the clusters explore. There is no set time for how long each cluster may take to explore with students, it could be 2 weeks per cluster or 3-4 weeks. Clusters may be repeated, merged or omitted (please see these are examples). Decisions about how the clusters are arranged and implemented should be made by teachers at a school/grade/classroom level based on students' needs, abilities, and interests.

References

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Clarke, D. M., Clarke, D. J., & Sullivan, P. (2012). Important ideas in mathematics: What are they and where do you get them? *Australian Primary Mathematics Classroom*, *17*(3), 13.

Hurst, C., & Hurrell, D. (2014). Developing the big ideas of number. *International Journal of Educational Studies in Mathematics*, *1*(2), 1-18.

Mathematics K-10 Syllabus outcomes © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2012.

Pirie, S., & Kieren, T. (1994). Growth in mathematical understanding: How can we characterise it and how can we represent it? *Educational Studies in Mathematics, 26*(2/3), 165-190. doi:10.1007/BF01273662

Siemon, D., Bleckly, J., & Neal, D. (2012). Working with the big ideas in number and the Australian Curriculum: Mathematics. *2012). Engaging the Australian National Curriculum: Mathematics–Perspectives from the Field. Online Publication: Mathematics Education Research Group of Australasia*, 19-45.

Tout, D. & Spithill, J. (2015). Big Ideas in Mathematics Teaching. *The Research Digest, QCT, 2015 (11*)

What is mathematical beauty Jo Boaler (Youcubed)

Clusters mapped to big ideas

Stage 1 Clusters

Partitioning	Pattern	Comparing	Structure	Relationships
• Cluster 2: Visual representation of collections • Cluster 6: Partitioning • Cluster 7: Place Value • Cluster 8: Applies non-count-by-ones • Cluster 9: One ten is ten ones • Cluster 10: One hundred can be regrouped • Cluster 23: A fraction is a number that represents a relationship • Cluster 24: Fractions are created through sharing - division	• Cluster 1: Counting numbers • Cluster 5: Number Representations • Cluster 11: Any number can be a countable unit • Cluster 12: Numbers can be represented using pairs • Cluster 13: Patterns repeat or grow • Cluster 28: Patterns can be created using shapes	• Cluster 2: Visual representation of collections • Cluster 3: Comparing quantities • Cluster 14: The 'equals sign' means 'the same as' • Cluster 17: Quantities can be estimated • Cluster 18: Benchmarks can be used to estimate quantity • Cluster 21: Objects can be ordered • Cluster 22: Objects can be measured and compared • Cluster 30: Time can be measured • Content Cluster 34: Events can be measured and predicted based on chance	• Cluster 4: Trusting the count • Cluster 5: Number Representations • Cluster 11: Any number can be a countable unit • Cluster 12: Numbers can be represented using pairs • Cluster 15: Array structure • Cluster 16: The 'for each' concept • Cluster 19: An object has attributes that can be measured • Cluster 20: Repeated units provide structure • Cluster 25: A fraction can be represented in many ways • Cluster 26: Shape properties remain constant • Cluster 27: Shapes and objects are classified • Cluster 31: Time (duration) can be visually represented	• Cluster 8: Applies non-count-by-ones • Cluster 9: One ten is ten ones • Cluster 10: One hundred can be regrouped • Cluster 23: A fraction is a number that represents a relationship • Cluster 29: Locating: Your position can be described • Cluster 30: Time can be measured • Cluster 32: Information can be collected • Cluster 33: Information can be presented visually

Stage 1 Overview of Content Clusters

Content Cluster 1: Counting numbers (follow a pattern to develop number sense and place value)

Content Cluster 2: Visual representation of collections allows us to compare quantities

Content Cluster 3: Comparing quantities (using numbers, symbols and words)

Content Cluster 4: Trusting the count: Counting can start from numbers other than one (as a starting point for addition and subtraction)

Content Cluster 5: Number Representations: Numbers can be represented by words/language, images/drawings, number

Content Cluster 6: Partitioning: Numbers can be partitioned in multiple ways (part-whole number knowledge)

Content Cluster 7: Place Value: A number can be regrouped or renamed to aid in operating with the number (partitioning to operate with numbers)

Content Cluster 8: Applies non-count-by-ones (as flexible arithmetic strategies)

Content Cluster 9: One ten is ten ones (number relationships, place value)

Content Cluster 10: One hundred can be regrouped as ten tens, or, one hundred ones (number relationships, place value)

Content Cluster 11: Any number can be a countable unit e.g. counting by fives off the decade (e.g. relate to money)

Content Cluster 12: Numbers can be represented using pairs to show odd and even

Content Cluster 13: Patterns repeat or grow and the next number can be predicted (number structure)

Content Cluster 14: The ‘equals sign’ means ‘the same as’ (equality and inequality)

Content Cluster 15: Array structure: Multiples can be visually represented in an array (structure of number)

Content Cluster 16: The ‘for each’ concept: For each one of these (how many rows) there are some of those (how much in each row) - multiplicative thinking

Content Cluster 17: Quantities can be estimated (how much/ how many) using counting

Content Cluster 18: Benchmarks can be used to estimate quantity (how much/ how many)

Content Cluster 19: An object has attributes that can be measured using different processes

Content Cluster 20: Repeated units provide structure: Units of measurement can be iterated (no gaps or overlaps)

Content Cluster 21: Objects can be ordered based on (informal) units of measurement (e.g. size, quantity/number of cubes a container can hold)

Stage 1 Overview of Content Clusters cont.

Content Cluster 22: Objects can be measured and compared using formal units

Content Cluster 23: A fraction is a number that represents a relationship between parts and the whole (number relationships)

Content Cluster 24: Fractions are created through sharing - division (a fraction is less than one whole and that fractions are the result of dividing e.g sharing 2 biscuits among 4 people)

Content Cluster 25: A fraction can be represented in many ways e.g as length, area, or a collection (continuous and discrete representations)

Content Cluster 26: Shape properties remain constant even when they are moved or reorientated (transforming shapes)

Content Cluster 27: Shapes and objects are classified based on properties (describing and comparing features)

Content Cluster 28: Patterns can be created using shapes (copying, turning, flipping, sliding)

Content Cluster 29: Locating: Your position can be described in relation to other objects or landmarks

Content Cluster 30: Time can be measured in minutes and hours

Content Cluster 31: Time (duration) can be visually represented in multiple ways e.g. calendars, clocks, timetables

Content Cluster 32: Information can be collected and represented using numbers

Content Cluster 33: Information can be presented visually to convey meaning (data representations)

Content Cluster 34: Events can be measured and predicted based on chance

Stage 1 Content Cluster outcome mapping

	1 Counting numbers	2 Visual representation of collections	3 Comparing quantities	4 Trusting the count	5 Number Representations	6 Partitioning: Numbers can be partitioned	7 Place Value	8 Applies non-count-by-ones	9 One ten is ten ones	10 One hundred can be regrouped as ten tens	11 Any number can be a countable unit	12 Numbers can be represented using pairs	13 Patterns repeat or grow	14 The equals sign means 'the same as'	15 Array structure	16 The 'for each' concept	17 Quantities can be estimated	18 Benchmarks can be used to estimate	19 An object has attributes that can be measured	20 Repeated units provide structure	21 Objects can be ordered	22 Objects can be measured and compared	23 A fraction is a number	24 Fractions are created through sharing di	25 A fraction can be represented in many ways	26 Shape properties remain constant	27 Shapes and objects are classified	28 Patterns can be created using shapes	29 Locating: Your position can be described	30 Time can be measured in minutes and hours	31 Time (duration)	32 Information can be collected	33 Information can be presented visually	34 Events can be measured (chance)
Whole Number MA1-4NA	■	■		■	■	■	■	■	■	■	■	■	■			■				■	■										■	■		
Add & Sub MA1-5NA		■	■	■	■	■	■	■	■					■			■	■	■	■	■	■											■		
Multi & Division MA1-6NA	■	■	■	■	■	■	■	■			■		■		■	■	■		■	■				■	■									
Frac & Dec MA1-7NA			■			■												■					■	■	■					■				
Pat & Algebra MA1-8NA	■			■	■			■	■		■	■	■	■	■	■												■						
Length MA1-9MG										■							■	■	■	■	■	■			■										
Area MA1-10MG															■		■		■	■	■														
Vol & Cap MA1-11MG																	■		■		■														
Mass MA1-12MG														■			■		■																
Time MA1-13MG																		■					■		■						■	■			■
3D Space MA1-14MG																			■							■	■		■					
2D Space MA1-15MG																							■			■	■	■	■				■	
Position MA1-16MG										■																■			■					
Data MA1-17SP																																■	■	
Chance MA1-18SP																															■			■

Stage 1 Content Clusters

Content Cluster 1: Counting numbers (follow a pattern to develop number sense and place value)			
Whole Numbers 1 MA1-4NA Read, write and order two-digit numbers Read and use ordinal names to at least 'thirty-first'	**Whole Numbers 2 MA1-4NA** Read, write and order three-digit numbers	**Multiplication and Division 1 MA1-6NA** Rhythmic and skip count by twos, fives and tens from zero	**Patterns and Algebra 1 MA1-8NA** Recognise, copy, continue, create and describe increasing and decreasing number patterns **Patterns and Algebra 2 MA1-8NA** Describe patterns with numbers and identify missing elements

Content Cluster 2: Visual representation of collections allows us to compare quantities			
Addition and Subtraction 1 MA1-5NA Model addition and subtraction using concrete materials Model and apply the commutative property for addition Use the equals sign to record equivalent number sentences	**Whole Numbers 1 MA1-4NA** Partition two-digit numbers using place value	**Addition and Subtraction 2 MA1-5NA** Make connections between addition and subtraction	**Multiplication and Division 1 MA1-6NA** Model and use equal 'groups of' objects as a strategy for multiplication **Multiplication and Division 2 MA1-6NA** Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication Model and use groups, arrays and repeated subtraction as strategies for division Record using drawings, words and numerals

Stage 1 Content Clusters

Content Cluster 3: Comparing quantities (using numbers, symbols and words)			
Addition and Subtraction 1 MA1-5NA Model addition and subtraction using concrete materials Model and apply the commutative property for addition Record number sentences using drawings, words, numerals and the symbols +, – and =	**Addition and Subtraction 2 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of two-digit numbers Make connections between addition and subtraction	**Multiplication and Division 1 MA1-6NA** Model division by sharing a collection equally into a given number of groups to determine the number in each group Model division by sharing a collection equally into groups of a given size to determine the number of groups **Multiplication and Division 2 MA1-6NA** Record using drawings, words and numerals	**Fractions and Decimals 1 MA1-7NA** Use fraction notation 1/2 **Fractions and Decimals 2 MA1-7NA** Use fraction notation 1/4 and 1/8

Content Cluster 4: Trusting the count: Counting can start from numbers other than one (as a starting point for addition and subtraction)			
Whole Numbers 1 MA1-4NA Count forwards and backwards by ones from a two-digit number **Whole Numbers 2 MA1-4NA** Count forwards and backwards by twos, threes, fives and tens from any starting point	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials	**Multiplication and Division 1 MA1-6NA** Rhythmic and skip count by twos, fives and tens from zero	**Patterns and Algebra 2 MA1-8NA** Describe patterns with numbers and identify missing elements

Stage 1 Overview Clusters

Content Cluster 5: Number Representations: Numbers can be represented by words/language, images/drawings, number			
Whole Numbers 1 MA1-4NA Read, write and order two-digit numbers Read and use ordinal names to at least 'thirty-first'	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials Record number sentences using drawings, words, numerals and the symbols +, – and = Use the equals sign to record equivalent number sentences **Addition and Subtraction 2 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of two-digit numbers	**Multiplication and Division 2 MA1-6NA** Model and use groups, arrays and repeated subtraction as strategies for division Record using drawings, words and numerals	**Patterns and Algebra 1 MA1-8NA** Recognise, copy, create, continue and describe repeating patterns of objects or symbols Model and describe odd and even numbers

Content Cluster 6: Partitioning: Numbers can be partitioned in multiple ways (part-whole number knowledge)			
Whole Numbers 1 MA1-4NA Partition two-digit numbers using place value **Whole Numbers 2 MA1-4NA** Partition numbers of up to three digits using place value	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials Recognise and recall combinations of numbers that add to numbers up to 20 Model and apply the commutative property for addition **Addition and Subtraction 2 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of two-digit numbers	**Multiplication and Division 1 MA1-6NA** Model division by sharing a collection equally into a given number of groups to determine the number in each group Model division by sharing a collection equally into groups of a given size to determine the number of groups **Multiplication and Division 2 MA1-6NA** Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication Model and use groups, arrays and repeated subtraction as strategies for division	**Fractions and Decimals 1 MA1-7NA** Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections **Fractions and Decimals 2 MA1-7NA** Recognise, describe and represent halves, quarters and eighths of whole objects, shapes and collections

Stage 1 Content Clusters

Content Cluster 7: Place Value: A number can be regrouped or renamed to aid in operating with the number (partitioning to operate with numbers)		
Whole Numbers 1 MA1-4NA Partition two-digit numbers using place value **Whole Numbers 2 MA1-4NA** Partition numbers of up to three digits using place value	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials Model and apply the commutative property for addition **Addition and Subtraction 2 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of two-digit numbers Solve word problems involving addition and subtraction	**Multiplication and Division 1 MA1-6NA** Model and use equal 'groups of' objects as a strategy for multiplication Model division by sharing a collection equally into a given number of groups to determine the number in each group Model division by sharing a collection equally into groups of a given size to determine the number of groups **Multiplication and Division 2 MA1-6NA** Model and use groups, arrays and repeated subtraction as strategies for division

Content Cluster 8: Applies non-count-by-ones (as flexible arithmetic strategies)				
Addition and Subtraction 1 MA1-5NA Model addition and subtraction using concrete materials Recognise and recall combinations of numbers that add to numbers up to 20 Model and apply the commutative property for addition Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers	**Whole Numbers 1 MA1-4NA** Partition two-digit numbers using place value	**Addition and Subtraction 2 MA1-5NA** Make connections between addition and subtraction Use and record a range of mental strategies for addition and subtraction of two-digit numbers Solve word problems involving addition and subtraction	**Multiplication and Division 2 MA1-6NA** Model and use repeated addition as a strategy for multiplication	**Patterns and Algebra 2 MA1-8NA** Find missing numbers in number sentences involving one operation of addition or subtraction

Stage 1 Content Clusters

Content Cluster 9: One ten is ten ones (number relationships, place value)			
Whole Numbers 1 MA1-4NA Partition two-digit numbers using place value	**Addition and Subtraction 1 MA1-5NA** Recognise and recall combinations of numbers that add to numbers up to 20 Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers	**Addition and Subtraction 2 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of two-digit numbers	**Patterns and Algebra 2 MA1-8NA** Find missing numbers in number sentences involving one operation of addition or subtraction

Content Cluster 10: One hundred can be regrouped as ten tens, or, one hundred ones (number relationships, place value)		
Whole Numbers 2 MA1-4NA Partition numbers of up to three digits using place value Read, write and order three-digit numbers	**Length 2 MA1-9MG** Recognise the need for formal units to measure length Use metres and centimetres to measure and estimate lengths and distances Record lengths using the abbreviations m and cm	**Position 2 MA1-16MG** Represent the position of objects in models, photographs and drawings

Content Cluster 11: Any number can be a countable unit e.g. counting by fives off the decade (e.g. relate to money)			
Whole Numbers 1 MA1-4NA Recognise, describe and order Australian coins according to their value	**Whole Numbers 2 MA1-4NA** Count forwards and backwards by twos, threes, fives and tens from any starting point Recognise, count and order Australian coins and notes according to their value	**Multiplication and Division 1 MA1-6NA** Rhythmic and skip count by twos, fives and tens from zero	**Patterns and Algebra 2 MA1-8NA** Describe patterns with numbers and identify missing elements

Stage 1 Content Clusters

Content Cluster 12: Numbers can be represented using pairs to show odd and even	
Patterns and Algebra 1 MA1-7NA Model and describe odd and even numbers	**Whole Numbers 2 MA1-4NA** Count forwards and backwards by twos, threes, fives and tens from any starting point

Content Cluster 13: Patterns repeat or grow and the next number can be predicted (number structure)			
Whole Numbers 1 MA1-4NA Read, write and order two-digit numbers Read and use ordinal names to at least 'thirty-first' **Whole Numbers 2 MA1-4NA** Count forwards and backwards by twos, threes, fives and tens from any starting point	**Multiplication and Division 1 MA1-6NA** Rhythmic and skip count by twos, fives and tens from zero	**Patterns and Algebra 1 MA1-8NA** Recognise, copy, continue, create and describe increasing and decreasing number patterns Recognise, copy, create, continue and describe repeating patterns of objects or symbols	**Patterns and Algebra 2 MA1-8NA** Describe patterns with numbers and identify missing elements

Content Cluster 14: The 'equals sign' means 'the same as' (equality and inequality)			
Addition and Subtraction 1 MA1-5NA Record number sentences using drawings, words, numerals and the symbols +, – and = Use the equals sign to record equivalent number sentences Model and apply the commutative property for addition	**Addition and Subtraction 2 MA1-5NA** Make connections between addition and subtraction	**Patterns and Algebra 2 MA1-8NA** Find missing numbers in number sentences involving one operation of addition or subtraction	**Mass 1 MA1-12MG** Place objects on either side of a pan balance to obtain a level balance Use a pan balance to compare two objects based on mass

Stage 1 Content Clusters

Content Cluster 15: Array structure: Multiples can be visually represented in an array (structure of number)			
Multiplication and Division 1 MA1-6NA Rhythmic and skip count by twos, fives and tens from zero Model and use equal 'groups of' objects as a strategy for multiplication Model division by sharing a collection equally into a given number of groups to determine the number in each group Model division by sharing a collection equally into groups of a given size to determine the number of groups	**Multiplication and Division 2 MA1-6NA** Model and use repeated addition as a strategy for multiplication Multiplication and Division 2 MA1-6NA Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication Model and use groups, arrays and repeated subtraction as strategies for division	**Patterns and Algebra 1 MA1-8NA** Recognise, copy, create, continue and describe repeating patterns of objects or symbols	**Area 1 MA1-10MG** Use uniform informal units to measure and estimate areas Record areas by referring to the number and type of uniform informal unit used

Content Cluster 16: The 'for each' concept: For each one of these (how many rows) there are some of those (how much in each row) - multiplicative thinking			
Multiplication and Division 1 MA1-6NA Rhythmic and skip count by twos, fives and tens from zero Model and use equal 'groups of' objects as a strategy for multiplication Model division by sharing a collection equally into a given number of groups to determine the number in each group Model division by sharing a collection equally into groups of a given size to determine the number of groups	**Multiplication and Division 2 MA1-6NA** Model and use repeated addition as a strategy for multiplication Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication Model and use groups, arrays and repeated subtraction as strategies for division	**Patterns and Algebra 1 MA1-8NA** Recognise, copy, create, continue and describe repeating patterns of objects or symbols	**Whole Numbers 2 MA1-4NA** Count forwards and backwards by twos, threes, fives and tens from any starting point

Stage 1 Content Clusters

Content Cluster 17: Quantities can be estimated (how much/ how many) using counting					
Length 1 MA1-9MG Use uniform informal units to measure, compare and estimate lengths	**Area 1 MA1-10MG** Use uniform informal units to measure and estimate areas	**Volume and Capacity 1 MA1-11MG** Use uniform informal units to measure, compare and estimate capacities Use uniform informal units to measure and estimate volumes	**Mass MA1-12MG** Place objects on either side of a pan balance to obtain a level balance Use a pan balance to compare two objects based on mass **Mass 2 MA1-12MG** Use uniform informal units to measure, compare and estimate the masses of objects	**Multiplication and Division 2 MA1-6NA** Model and use repeated addition as a strategy for multiplication Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication	**Addition and Subtraction 1 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers

Content Cluster 18: Benchmarks can be used to estimate quantity (how much/ how many)			
Length 2 MA1-9MG Compare and order shapes/objects based on length measured using uniform informal units	**Time 2 MA1-13MG** Experience activities with duration of one hour, half/quarter of an hour, one minute and a few seconds	**Fractions and Decimals 1 MA1-7NA** Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections Use fraction notation 1/2 **Fractions and Decimals 2 MA1-7NA** Recognise, describe and represent halves, quarters and eighths of whole objects, shapes and collections Use fraction notation 1/4 and 1/8	**Addition and Subtraction 1 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers

Stage 1 Content Clusters

Content Cluster 19: An object has attributes that can be measured using different processes						
Length 1 MA1-9MG Use uniform informal units to measure, compare and estimate lengths **Length 2 MA1-9MG** Record lengths by referring to the number and type of uniform informal unit used	**Area 1 MA1-10MG** Use uniform informal units to measure and estimate areas Record areas by referring to the number and type of uniform informal unit used	**Volume and Capacity 1 MA1-11MG** Use uniform informal units to measure, compare and estimate capacities Use uniform informal units to measure and estimate volumes Record capacities and volumes by referring to the number and type of uniform informal unit used	**Mass 2 MA1-12MG** Use uniform informal units to measure, compare and estimate the masses of objects Record masses by referring to the number and type of uniform informal unit used	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers	**Multiplication and Division 2 MA1-6NA** Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication	**Three-Dimensional Space 2 MA1-14MG** Represent three-dimensional objects in models and drawings

Content Cluster 20: Repeated units provide structure: Units of measurement can be iterated (no gaps or overlaps)				
Length 1 MA1-9MG Use uniform informal units to measure, compare and estimate lengths **Length 2 MA1-9MG** Record lengths by referring to the number and type of uniform informal unit used	**Area 1 MA1-10MG** Use uniform informal units to measure and estimate areas Record areas by referring to the number and type of uniform informal unit used	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers **Addition and Subtraction 2 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of two-digit numbers	**Multiplication and Division 1 MA1-6NA** Rhythmic and skip count by twos, fives and tens from zero **Multiplication and Division 2 MA1-6NA** Model and use repeated addition as a strategy for multiplication Model and use arrays described in terms of 'rows' and 'columns' as a strategy for multiplication	**Whole Numbers 2 MA1-4NA** Count forwards and backwards by twos, threes, fives and tens from any starting point

Stage 1 Content Clusters

Content Cluster 21: Objects can be ordered based on (informal) units of measurement (e.g. size, quantity/number of cubes a container can hold)				
Whole Numbers 1 MA1-4NA Read, write and order two-digit numbers	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials	**Length 2 MA1-9MG** Compare and order shapes/objects based on length measured using uniform informal units	**Area 2 MA1-10MG** Compare and order surfaces based on area measured using uniform informal units	**Volume 2 MA1-11MG** Compare and order objects based on capacity and volume measured using uniform informal units

Content Cluster 22: Objects can be measured and compared using formal units	
Length 2 MA1-9MG Recognise the need for formal units to measure length Use metres and centimetres to measure and estimate lengths and distances Record lengths using the abbreviations m and cm	**Addition and Subtraction 1 MA1-5NA** Use and record a range of mental strategies for addition and subtraction of one- and two-digit numbers

Content Cluster 23: A fraction is a number that represents a relationship between parts and the whole (number relationships)			
Fractions and Decimals 1 MA1-7NA Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections	**Fractions and Decimals 2 MA1-7NA** Recognise, describe and represent halves, quarters and eighths of whole objects, shapes and collections	**Time 2 MA1-13MG** Experience activities with duration of one hour, half/quarter of an hour, one minute and a few seconds	**Two-Dimensional Space 2 MA1-15MG** Identify, perform, describe and record the result of full, half and quarter 'turns'

Stage 1 Content Clusters

Content Cluster 24: Fractions are created through sharing - division (a fraction is less than one whole and that fractions are the result of dividing e.g sharing 2 biscuits among 4 people)			
Fractions and Decimals 1 MA1-7NA Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections Use fraction notation 1/2	**Fractions and Decimals 2 MA1-7NA** Recognise, describe and represent halves, quarters and eighths of whole objects, shapes and collections Use fraction notation 1/4 and 1/8	**Multiplication and Division 1 MA1-6NA** Model division by sharing a collection equally into a given number of groups to determine the number in each group Model division by sharing a collection equally into groups of a given size to determine the number of groups	**Multiplication and Division 2 MA1-6NA** Model and use groups, arrays and repeated subtraction as strategies for division

Content Cluster 25: A fraction can be represented in many ways e.g as length, area, or a collection (continuous and discrete representations)				
Fractions and Decimals 1 MA1-7NA Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections Use fraction notation 1/2	**Fractions and Decimals 2 MA1-7NA** Recognise, describe and represent halves, quarters and eighths of whole objects, shapes and collections Use fraction notation 1/4 and 1/8	**Multiplication and Division 1 MA1-6NA** Model division by sharing a collection equally into a given number of groups to determine the number in each group	**Length 2 MA1-9MG** Use metres and centimetres to measure and estimate lengths and distances Record lengths using the abbreviations m and cm	**Time 2 MA1-13MG** Experience activities with duration of one hour, half/quarter of an hour, one minute and a few seconds

Stage 1 Content Clusters

Content Cluster 26: Shape properties remain constant even when they are moved or reorientated (transforming shapes)		
Three-Dimensional Space 1 MA1-14MG Identify cones, cubes, cylinders, spheres and prisms presented in different orientations, in pictures and the environment Recognise that three-dimensional objects look different from different vantage-points	**Two-Dimensional Space 1 MA1-15MG** Identify and name triangles, quadrilaterals, pentagons, hexagons and octagons presented in different orientations, in pictures and the environment	**Two-Dimensional Space 2 MA1-15MG** Make and draw two-dimensional shapes in different orientations Identify, perform, describe and record the result of full, half and quarter 'turns'

Content Cluster 27: Shapes and objects are classified based on properties (describing and comparing features)		
Three-Dimensional Space 1 MA1-14MG Distinguish between flat and curved surfaces Use the term 'faces' to describe flat surfaces with straight edges	**Three-Dimensional Space 2 MA1-14MG** Use the terms 'flat surface', 'curved surface', 'face', 'edge' and 'vertex' appropriately to describe three-dimensional objects Recognise faces of three-dimensional objects as two-dimensional shapes Distinguish between three-dimensional objects and two-dimensional shapes Represent three-dimensional objects in models and drawings	**Two-Dimensional Space 1 MA1-15MG** Identify horizontal, vertical and parallel lines Use the terms 'side' and 'vertex' to describe and compare two-dimensional shapes

Content Cluster 28: Patterns can be created using shapes (copying, turning, flipping, sliding)		
Two-Dimensional Space 1 MA1-15MG Identify horizontal, vertical and parallel lines	**Two-Dimensional Space 2 MA1-15MG** Make and draw two-dimensional shapes in different orientations Identify, perform and record the result of one-step 'slides' and 'flips' Make symmetrical designs with a variety of materials Identify, perform, describe and record the result of full, half and quarter 'turns'	**Patterns and Algebra 1 MA1-8NA** Recognise, copy, create, continue and describe repeating patterns of objects or symbols

Stage 1 Content Clusters

Content Cluster 29: Locating: Your position can be described in relation to other objects or landmarks			
Position 1 MA1-16MG Give and follow directions to move to familiar locations and to position objects Use the terms 'left' and 'right' to describe position in relation to self and from the perspective of a person facing in the opposite direction Describe a path from one location to another	**Position 2 MA1-16MG** Interpret simple maps of familiar locations Represent the position of objects in models, photographs and drawings	**Two-Dimensional Space 2 MA1-15MG** Make and draw two-dimensional shapes in different orientations	**Three-Dimensional Space 2 MA1-14MG** Represent three-dimensional objects in models and drawings

Content Cluster 30: Time can be measured in minutes and hours		
Time 1 MA1-13MG Tell time to the half-hour **Time 2 MA1-13MG** Experience activities with duration of one hour, half/quarter of an hour, one minute and a few seconds Tell time to the quarter-hour, using the language of 'past' and 'to'	**Fractions and Decimals 1 MA1-7NA** Recognise, describe and represent one-half as one of two equal parts of whole objects, shapes and collections	**Chance 1 MA1-18SP** Recognise the element of chance in familiar situations Describe chance events using everyday language **Chance 2 MA1-18SP** Identify practical activities and everyday events that involve chance Describe events as 'likely' or 'unlikely'

Content Cluster 31: Time (duration) can be visually represented in multiple ways e.g. calendars, clocks		
Whole Numbers 1 MA1-4NA Read and use ordinal names to at least 'thirty-first'	**Time 1 MA1-13MG** Name and order months and seasons Use a calendar to identify the date and determine the number of days in each month	**Time 2 MA1-13MG** Use a calendar to determine duration in months, weeks and days Use informal units to measure and compare the durations of events Experience activities with duration of one hour, half/quarter of an hour, one minute and a few seconds

Stage 1 Content Clusters

Content Cluster 32: Information can be collected and represented using numbers			
Data 1 MA1-17SP Collect data and track what has been counted **Data 2 MA1-17SP** Pose questions and collect categorical data	**Whole Numbers 1 MA1-4NA** Count forwards and backwards by ones from a two-digit number	**Addition and Subtraction 2 MA1-5NA** Solve word problems involving addition and subtraction	**Addition and Subtraction 1 MA1-5NA** Model addition and subtraction using concrete materials Record number sentences using drawings, words, numerals and the symbols +, – and =

Content Cluster 33: Information can be presented visually to convey meaning (data representations)		
Data 1 MA1-17SP Create data displays using objects and pictures (one-to-one correspondence) and interpret them	**Data 2 MA1-17SP** Create data displays using lists, tables and picture graphs (one-to-one correspondence) and interpret them	**Two-Dimensional Space 1 MA1-15MG** Identify horizontal, vertical and parallel lines

Content Cluster 34: Events can be measured and predicted based on chance		
Chance 1 MA1-18SP Recognise the element of chance in familiar situations Describe chance events using everyday language	**Chance 2 MA1-18SP** Identify practical activities and everyday events that involve chance Describe events as ‘likely’ or ‘unlikely’ Distinguish between ‘possible’ and ‘impossible’ events Identify some events as ‘certain’ or ‘impossible’	**Time 2 MA1-13MG** Use informal units to measure and compare the durations of events