

Content Clusters - Stage 3

Scope and sequencing by conceptual understanding

This is the scope... you create the sequence.

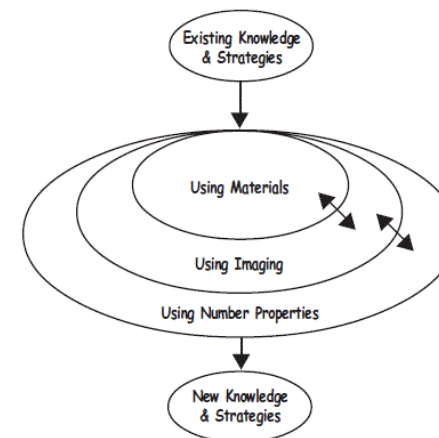
In this resource I provide possible ways of how groups of outcomes and their key ideas can be sequenced together based on the concepts they address. These are just examples and is not an exhaustive list of the clusters you can use to make connections across mathematics. I have used the [syllabus outcomes](#), 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.

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](https://nzmaths.co.nz/), 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.

<https://primarylearning.com.au>



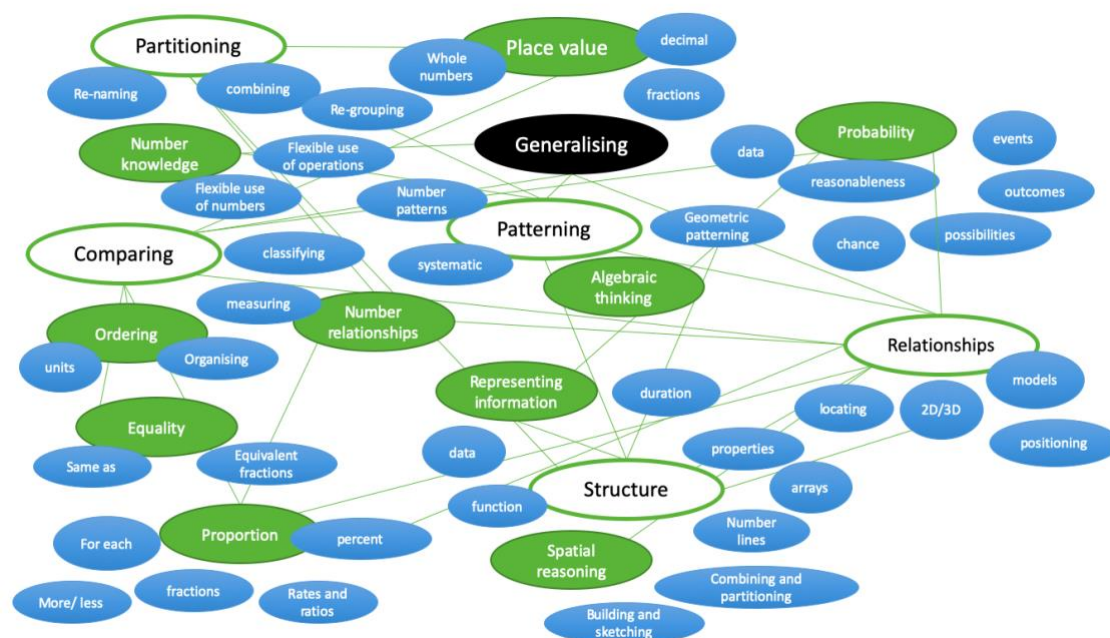
A (scope and) sequence should:

- 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

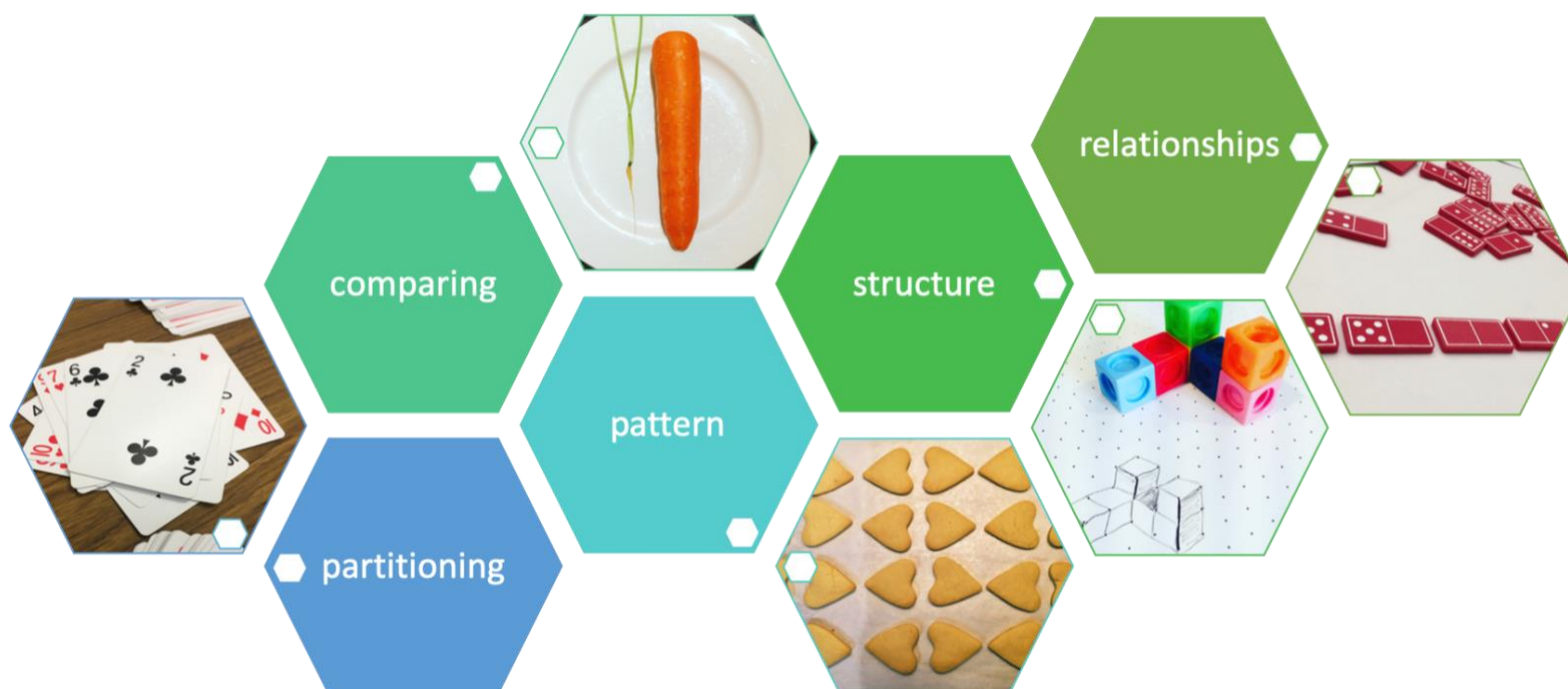
NESA states that for their [registration process](#) as evidence of compliance schools need to provide “scope and sequence of learning/units of work in relation to outcomes of NESA syllabus for each KLA for each Year” (page 10). **Note:** Most schools have a set, wider grade or school-based scope and 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
<ul style="list-style-type: none"> • Combining • Part-whole • Place value • Modelling • Whole numbers • Decimals • Fractions 	<ul style="list-style-type: none"> • Geometric • Number • Algebraic • Generalising • Predicting 	<ul style="list-style-type: none"> • Equality (with numbers and measurement) • Ordering • Proportion (fractions, percent, rates, ratios) • Magnitude • Estimating 	<ul style="list-style-type: none"> • Number • Arrays • Shape • Measuring • Spatial • Building and sketching • Representing features (shape, data) 	<ul style="list-style-type: none"> • 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 3 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 strand headings). A few clusters have been revised (Cluster 3, 11 and 19) to add in other connections that have arisen, specifically time concepts. 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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- Hurst, C., & Hurrell, D. (2014). Developing the big ideas of number. *International Journal of Educational Studies in Mathematics*, 1(2), 1-18.
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- Tout, D. & Spithill, J. (2015). Big Ideas in Mathematics Teaching. *The Research Digest, QCT*, 2015 (11)
- [What is mathematical beauty](#) Jo Boaler (Youtubed)

Clusters mapped to big ideas

Stage 3 Clusters

Partitioning	Pattern	Comparing	Structure	Relationships
<ul style="list-style-type: none"> •Content Cluster 1: Place value •Content Cluster 5: Partitioning •Content Cluster 6: Flexible strategies for operating with numbers •Content Cluster 7: A variety of strategies can be applied to solve word problems •Content Cluster 8: Multiples can be visually represented as an array •Content Cluster 11: Number relationships – converting •Content Cluster 12: Money uses a many-to-one scale •Content Cluster 17: A fraction is a number 	<ul style="list-style-type: none"> •Content Cluster 2: Representing numbers •Content Cluster 8: Multiples can be visually represented as an array •Content Cluster 13: The ‘equals sign’ means “the same as” •Content Cluster 14: Numbers can be represented using pairs •Content Cluster 15: Patterns repeat or grow •Content Cluster 16: Patterns can be represented geometrically 	<ul style="list-style-type: none"> •Content Cluster 3: Comparing quantities – linear •Content Cluster 4: Comparing quantities – area/volume/mass •Content Cluster 9: Reasonableness of solutions can be checked •Content Cluster 10: Benchmark numbers can be used to estimate quantities •Content Cluster 11: Number relationships – converting •Content Cluster 13: The ‘equals sign’ means “the same as” •Content Cluster 19: Fractions as a measure •Content Cluster 21: Time can be measured and compared •Content Cluster 22: Numbers and quantities can be compared using scale •Content Cluster 25: Objects can be measured and compared •Content Cluster 26: Shapes can be measured and compared •Content Cluster 27: Shape and objects are classified •Content Cluster 29: Information can be collected, analysed and interpreted •Content Cluster 31: Events can be predicted, compared, and analysed 	<ul style="list-style-type: none"> •Content Cluster 1: Place value •Content Cluster 2: Representing numbers •Content Cluster 4: Comparing quantities – area/volume/mass •Content Cluster 5: Partitioning •Content Cluster 8: Multiples can be visually represented as an array •Content Cluster 15: Patterns repeat or grow •Content Cluster 16: Patterns can be represented geometrically •Content Cluster 23: Measurements are approximations •Content Cluster 24: The multiplicative structure •Content Cluster 28: Grid references and coordinates can be used for locating and positioning •Content Cluster 30: Information can be presented visually •Content Cluster 32: Probabilities of events can be described in a range of 0 – 1 	<ul style="list-style-type: none"> •Content Cluster 1: Place value •Content Cluster 6: Flexible strategies for operating with numbers •Content Cluster 11: Number relationships – converting •Content Cluster 12: Money uses a many-to-one scale •Content Cluster 13: The ‘equals sign’ means “the same as” •Content Cluster 14: Numbers can be represented using pairs •Content Cluster 17: A fraction is a number •Content Cluster 18: Fractions represent division •Content Cluster 20: Fractions as an operator •Content Cluster 22: Numbers and quantities can be compared using scale •Content Cluster 28: Grid references and coordinates can be used for locating and positioning •Content Cluster 32: Probabilities of events can be described in a range of 0 – 1

Stage 3 Overview of Content Clusters

Content Cluster 1: Place value (numbers can be regrouped and renamed – partitioning)

Content Cluster 2: Representing numbers (numbers can be represented, ordered and compared based on their place value)

Content Cluster 3: Comparing quantities – linear focus (numbers can be compared based on size and place value)

Content Cluster 4: Comparing quantities – area/volume/mass focus (numbers can be compared based on size and place value)

Content Cluster 5: Partitioning: Part-whole number knowledge (numbers can be partitioned in multiple ways)

Content Cluster 6: Flexible strategies for operating with numbers (numbers can be partitioned to assist with computation)

Content Cluster 7: A variety of strategies can be applied to solve word problems

Content Cluster 8: Multiples can be visually represented as an array ('for each' number structure)

Content Cluster 9: Reasonableness of solutions can be checked using estimation

Content Cluster 10: Benchmark numbers can be used to estimate quantities (how much/how many)

Content Cluster 11: Number relationships – converting (e.g. one thousand can be regrouped as 10 hundreds, 100 tens, or 1000 ones)

Content Cluster 12: Money uses a many-to-one scale (link to place value e.g. 100 cents is equal to \$1)

Content Cluster 13: The 'equals sign' means "the same as" (equality and inequality)

Content Cluster 14: Numbers can be represented using pairs to explore odd and even properties

Content Cluster 15: Patterns repeat or grow and future terms can be predicted (number structure)

Content Cluster 16: Patterns can be represented geometrically

Content Cluster 17: A fraction is a number (that represents a relationship between parts and the whole)

Content Cluster 18: Fractions represent division (number relationships)

Content Cluster 19: Fractions as a measure

Content Cluster 20: Fractions as an operator

Content Cluster 21: Time can be measured and compared in hours, minutes and seconds (relating 12 to 24 hour time)

Stage 3 Overview of Content Clusters cont.

Content Cluster 22: Numbers and quantities can be compared using scale (links to proportionality)

Content Cluster 23: Measurements are approximations and can be represented using formal units

Content Cluster 24: The multiplicative structure (row and column) can be applied to measure area and volume

Content Cluster 25: Objects can be measured and compared through different representations

Content Cluster 26: Shapes can be measured and compared through different representations

Content Cluster 27: Shape and objects are classified based on their properties

Content Cluster 28: Grid references and coordinates can be used for locating and positioning

Content Cluster 29: Information can be collected, analysed and interpreted using numbers (collecting data)

Content Cluster 30: Information can be presented visually to convey meaning (data representations and exploring bias)

Content Cluster 31: Events can be predicted, compared, and analysed based on probability

Content Cluster 32: Probabilities of events can be described in a range of 0 – 1 (probabilities as fractions of a whole)

Stage 3 Content Cluster outcome mapping

	1 Place value	2 Representing numbers	3 Comparing quantities – linear	4 Comparing quantities – area/volume/mass	5 Partitioning: Part-whole number	6 Flexible strategies for operating	7 A variety of strategies can be used	8 Multiples can be visually represented: area	9 Reasonableness of solutions: estimation	10 Benchmark numbers can be used to estimate	11 Number relationships – converting	12 Money uses a many-to-one scale	13 The 'equals sign' means 'the same as'	14 Numbers can be represented using pairs	15 Patterns repeat or grow	16 Patterns can be represented geometrically	17 A fraction is a number	18 Fractions represent division	19 Fractions as a measure	20 Fractions as an operator	21 Time can be measured and compared	22 Numbers and quantities can be compared: scale	23 Measurements are approximations	The multiplicative structure	25 Objects can be measured and compared	26 Shapes can be measured and compared	27 Shape and objects are classified	28 Grid references and coordinates	29 Information can be collected, analysed	30 Information can be presented visually	31 Events can be predicted, compared	32 Probabilities of events: range of 0 – 1
Whole Number MA3-4NA																																
Add & Sub MA3-5NA																																
Multi & Div MA3-6NA																																
Frac & Dec MA3-7NA																																
Pat & Alg MA3-8NA																																
Length MA3-9MG																																
Area MA3-10MG																																
Vol & Cap MA3-11MG																																
Mass MA3-12MG																																
Time MA3-13MG																																
3D Space MA3-14MG																																
2D Space MA3-15MG																																
Angles MA3-16MG																																
Position MA3-17MG																																
Data MA3-18SP																																
Chance MA3-19SP																																

Stage 3 Content Clusters

Content Cluster 1: Place value (numbers can be regrouped and renamed – partitioning)

Whole Numbers 1 MA3-4NA

State the place value of digits in numbers of any size
Record numbers of any size using expanded notation

Whole Numbers 2 MA3-4NA

Identify and describe prime and composite numbers

Fractions and Decimals 1 MA3-7NA

Apply the place value system to represent thousandths as decimals

Express mixed numerals as improper fractions and vice versa

Fractions and Decimals 2 MA3-7NA

Multiply and divide decimals by 10, 100 and 1000

Write fractions in their 'simplest form'

Content Cluster 2: Representing numbers (numbers can be represented, ordered and compared based on their place value)

Whole Numbers 1 MA3-4NA

Read, write and order numbers of any size

Whole Numbers 2 MA3-4NA

Recognise the location of negative numbers in relation to zero on a number line

Fractions and Decimals 1 MA3-7NA

Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100

Compare, order and represent decimals with up to three decimal places

Fractions and Decimals 2 MA3-7NA

Represent, compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100

Length 2 MA3-9MG

Record lengths and distances using decimal notation to three decimal places

Volume and Capacity 2 MA3-11MG

Record volumes and capacities using decimal notation to three decimal places

Mass 2 MA3-12MG

Record mass using decimal notation to three decimal places

Stage 3 Content Clusters

Content Cluster 3: Comparing quantities – linear focus (numbers can be compared based on size and place value)				
Fractions and Decimals 1 MA3-7NA Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Compare, order and represent decimals with up to three decimal places	Length 1 MA3-9MG Use the kilometre to measure lengths and distances Select and use appropriate instruments and units to measure lengths Record lengths and distances using the abbreviations km, m, cm and mm	Length 2 MA3-9MG Record lengths and distances using decimal notation to three decimal places Convert between kilometres, metres, centimetres and millimetres	Volume and Capacity 2 MA3-11MG Record volumes and capacities using decimal notation to three decimal places Convert between millilitres and litres	Time 1MA3-13MG Convert between 12- and 24-hour time
Content Cluster 4: Comparing quantities – area/volume/mass focus (numbers can be compared based on size and place value)				
Fractions and Decimals 1 MA3-7NA Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Compare, order and represent decimals with up to three decimal places	Area 1 MA3-10MG Recognise the need for square kilometres and hectares to measure area Record areas using the abbreviations km ² and ha	Volume and Capacity 1 MA3-11MG Use cubic centimetres and cubic metres to measure and estimate volumes Select and use appropriate units to measure volume Record volumes using the abbreviations cm ³ and m ³	Mass 1 MA3-12MG Recognise the need for tonnes to measure mass Record masses using the abbreviations t, kg and g Select and use appropriate instruments and units to measure mass Solve problems involving mass Mass 2 MA3-12MG Record mass using decimal notation to three decimal places Convert between tonnes, kilograms and grams	

Stage 3 Content Clusters

Content Cluster 5: Partitioning: Part-whole number knowledge (numbers can be partitioned in multiple ways)

Whole Numbers 1 MA3-4NA Record numbers of any size using expanded notation Whole Numbers 2 MA3-4NA Identify and describe prime and composite numbers	Fractions and Decimals 1 MA3-7NA Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Express mixed numerals as improper fractions and vice versa	Fractions and Decimals 2 MA3-7NA Represent, compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Write fractions in their 'simplest form'	Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator, including problems that result in a remainder
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Content Cluster 6: Flexible strategies for operating with numbers (numbers can be partitioned to assist with computation)

Addition and Subtraction 1 MA3-5NA Select and apply efficient mental, written and calculator strategies for addition and subtraction of numbers of any size	Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to multiply by one- and two-digit operators Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator, including problems that result in a remainder	Fractions and Decimals 1 MA3-7NA Model and represent strategies to add and subtract fractions with the same denominator Fractions and Decimals 2 MA3-7NA Add and subtract fractions, included mixed numerals, with the same or related denominators Use mental, written and calculator strategies to add and subtract decimals with up to three decimal places Use mental, written and calculator strategies to multiply decimals by one- and two-digit whole numbers Use mental, written and calculator strategies to divide decimals by one-digit whole numbers
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Stage 3 Content Clusters

Content Cluster 7: A variety of strategies can be applied to solve word problems

Addition and Subtraction 1 MA3-5NA Solve word problems and record the strategy used, including problems involving money	Addition and Subtraction 2 MA3-5NA Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used	Multiplication and Division 1 MA3-6NA Solve word problems and record the strategy used Multiplication and Division 2 MA3-6NA Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used	Fractions and Decimals 2 MA3-7NA Solve word problems involving fractions and decimals, including money problems
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Content Cluster 8: Multiples can be visually represented as an array ('for each' number structure)

Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to multiply by one- and two-digit operators Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator, including problems that result in a remainder	Multiplication and Division 2 MA3-6NA Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used	Area 1 MA3-10MG Develop a strategy to find areas of rectangles (including squares) and record the strategy in words Area 2 MA3-10MG Develop a strategy to find areas of triangles and record the strategy in words	Volume and Capacity 2 MA3-11MG Develop a strategy to find volumes of rectangular prisms and record the strategy in words	Patterns and Algebra 2 MA3-8NA Continue, create, record and describe geometric and number patterns in words
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Stage 3 Content Clusters

Content Cluster 9: Reasonableness of solutions can be checked using estimation

Addition and Subtraction 1 MA3-5NA Use estimation to check answers to calculations Solve word problems and record the strategy used, including problems involving money	Multiplication and Division 1 MA3-6NA Solve word problems and record the strategy used Use estimation to check answers to calculations	Multiplication and Division 2 MA3-6NA Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used	Fractions and Decimals 2 MA3-7NA Solve word problems involving fractions and decimals, including money problems
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Content Cluster 10: Benchmark numbers can be used to estimate quantities (how much/how many)

Addition and Subtraction 1 MA3-5NA Use estimation to check answers to calculations	Multiplication and Division 1 MA3-6NA Solve word problems and record the strategy used Use estimation to check answers to calculations	Fractions and Decimals 2 MA3-7NA Make connections between equivalent percentages, fractions and decimals	Volume and Capacity 1 MA3-11MG Use cubic centimetres and cubic metres to measure and estimate volumes Select and use appropriate units to measure volume	Angles 1 MA3-16MG Measure, compare and estimate angles in degrees (up to 360°) Record angle measurements using the symbol for degrees (°)
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Stage 3 Content Clusters

Content Cluster 11: Number relationships – converting (e.g. one thousand can be regrouped as 10 hundreds, 100 tens, or 1000 ones)

Whole Numbers 1 MA3-4NA Read, write and order numbers of any size State the place value of digits in numbers of any size Record numbers of any size using expanded notation	Time 1MA3-13MG Convert between 12- and 24-hour time Determine and compare the duration of events	Fractions and Decimals 1 MA3-7NA Apply the place value system to represent thousandths as decimals Fractions and Decimals 2 MA3-7NA Multiply and divide decimals by 10, 100 and 1000	Length 2 MA3-9MG Convert between kilometres, metres, centimetres and millimetres	Volume and Capacity 2 MA3-11MG Convert between millilitres and litres	Mass 2 MA3-12MG Convert between tonnes, kilograms and grams
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Content Cluster 12: Money uses a many-to-one scale (link to place value e.g. 100 cents is equal to \$1)

Addition and Subtraction 1 MA3-5NA Solve word problems and record the strategy used, including problems involving money Create a simple budget	Multiplication and Division 1 MA3-6NA Solve word problems and record the strategy used Interpret remainders in division problems	Fractions and Decimals 2 MA3-7NA Solve word problems involving fractions and decimals, including money problems Use mental, written and calculator strategies to calculate 10%, 25% and 50% of quantities, including as discounts
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Content Cluster 13: The 'equals sign' means "the same as" (equality and inequality)

Multiplication and Division 2 MA3-6NA Recognise and use grouping symbols Apply the order of operations in calculations	Patterns and Algebra 1 MA3-8NA Find missing numbers in number sentences involving multiplication or division on one or both sides of the equals sign	Fractions and Decimals 2 MA3-7NA Determine, generate and record equivalent fractions Make connections between equivalent percentages, fractions and decimals
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Stage 3 Content Clusters

Content Cluster 14: Numbers can be represented using pairs to explore odd and even properties

Patterns and Algebra 1 MA3-8NA

Identify, continue create and describe increasing and decreasing number patterns with fractions, decimals and whole numbers

Whole Numbers 1 MA3-4NA

Determine factors and multiples of whole numbers

Whole Numbers 2 MA3-4NA

Identify and describe prime and composite numbers

Model and describe square and triangular numbers

Content Cluster 15: Patterns repeat or grow and future terms can be predicted (number structure)

Patterns and Algebra 1 MA3-8NA

Identify, continue create and describe increasing and decreasing number patterns with fractions, decimals and whole numbers

Multiplication and Division 1 MA3-6NA

Use and record a range of mental and written strategies to multiply by one- and two-digit operators

Fractions and Decimals 1 MA3-7NA

Model and represent strategies to add and subtract fractions with the same denominator

Fractions and Decimals 2 MA3-7NA

Use mental, written and calculator strategies to add and subtract decimals with up to three decimal places

Use mental, written and calculator strategies to multiply decimals by one- and two-digit whole numbers

Use mental, written and calculator strategies to divide decimals by one-digit whole numbers

Whole Numbers 1 MA3-4NA

Read, write and order numbers of any size

Whole Numbers 2 MA3-4NA

Model and describe square and triangular numbers

Addition and Subtraction 1 MA3-5NA

Select and apply efficient mental, written and calculator strategies for addition and subtraction of numbers of any size

Stage 3 Content Clusters

Content Cluster 16: Patterns can be represented geometrically

Patterns and Algebra 2 MA3-8NA Continue, create, record and describe geometric and number patterns in words Determine the rule for geometric and number patterns in words and use the rule to calculate values	Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to multiply by one- and two-digit operators	Two-Dimensional Space 1 MA3-15MG Classify and draw regular and irregular two-dimensional shapes from descriptions of their features Use the terms 'translate', 'reflect' and 'rotate' to describe transformations of shapes Two-Dimensional Space 2 MA3-15MG Identify, use and describe combinations of translations, reflections and rotations	Whole Numbers 1 MA3-4NA Read, write and order numbers of any size Whole Numbers 2 MA3-4NA Model and describe square and triangular numbers	Addition and Subtraction 1 MA3-5NA Select and apply efficient mental, written and calculator strategies for addition and subtraction of numbers of any size
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Content Cluster 17: A fraction is a number (that represents a relationship between parts and the whole)

Fractions and Decimals 1 MA3-7NA Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Express mixed numerals as improper fractions and vice versa	Fractions and Decimals 2 MA3-7NA Represent, compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Determine, generate and record equivalent fractions Write fractions in their 'simplest form' Make connections between equivalent percentages, fractions and decimals	Whole Numbers 2 MA3-4NA Read, write and order numbers of any size State the place value of digits in numbers of any size Record numbers of any size using expanded notation
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Stage 3 Content Clusters

Content Cluster 18: Fractions represent division (number relationships)

Fractions and Decimals 1 MA3-7NA

Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100
Express mixed numerals as improper fractions and vice versa

Fractions and Decimals 2 MA3-7NA

Represent, compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100
Determine, generate and record equivalent fractions
Write fractions in their 'simplest form'

Multiplication and Division 1 MA3-6NA

Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator, including problems that result in a remainder
Interpret remainders in division problems

Patterns and Algebra 1 MA3-8NA

Identify, continue create and describe increasing and decreasing number patterns with fractions, decimals and whole numbers

Content Cluster 19: Fractions as a measure

Fractions and Decimals 1 MA3-7NA

Model and represent strategies to add and subtract fractions with the same denominator

Fractions and Decimals 2 MA3-7NA

Add and subtract fractions, included mixed numerals, with the same or related denominators

Length 1 MA3-9MG

Record lengths and distances using the abbreviations km, m, cm and mm
Find perimeters of common two-dimensional shapes and record the strategy

Length 2 MA3-9MG

Convert between kilometres, metres, centimetres and millimetres
Solve problems involving length and perimeter

Area 1 MA3-10MG

Recognise the need for square kilometres and hectares to measure area
Record areas using the abbreviations km² and ha
Develop a strategy to find areas of rectangles (including squares) and record the strategy in words

Area 2 MA3-10MG

Develop a strategy to find areas of triangles and record the strategy in words
Solve problems involving areas of rectangles (including squares) and triangles

Time 1 MA3-13MG

Convert between 12- and 24-hour time

Time 2 MA3-13MG

Interpret and use timetables

Stage 3 Content Clusters

Content Cluster 20: Fractions as an operator

Fractions and Decimals 2 MA3-7NA

Multiply fractions by whole numbers

Find a simple fraction of a quantity

Solve word problems involving fractions and decimals, including money problems

Make connections between equivalent percentages, fractions and decimals

Use mental, written and calculator strategies to calculate 10%, 25% and 50% of quantities, including as discounts

Addition and Subtraction 1 MA3-5NA

Solve word problems and record the strategy used, including problems involving money

Create a simple budget

Multiplication and Division 1 MA3-6NA

Use and record a range of mental and written strategies to multiply by one- and two-digit operators

Area 2 MA3-10MG

Solve problems involving areas of rectangles (including squares) and triangles

Content Cluster 21: Time can be measured and compared in hours, minutes and seconds (relating 12 to 24 hour time)

Time 1 MA3-13MG

Convert between 12- and 24-hour time

Determine and compare the duration of events

Time 2 MA3-13MG

Interpret and use timetables

Fractions and Decimals 1 MA3-7NA

Model and represent strategies to add and subtract fractions with the same denominator

Addition and Subtraction 2 MA3-5NA

Select and apply efficient mental, written and calculator strategies to solve word problems and record the strategy used

Stage 3 Content Clusters

Content Cluster 22: Numbers and quantities can be compared using scale (links to proportionality)

Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to multiply by one- and two-digit operators	Length 1 MA3-9MG Select and use appropriate instruments and units to measure lengths Record lengths and distances using the abbreviations km, m, cm and mm Length 2 MA3-9MG Convert between kilometres, metres, centimetres and millimetres	Position MA3-17MG Use grid-referenced maps to locate and describe positions Follow a sequence of directions, including compass directions, to find a particular location on a map Describe routes using landmarks and directional language	Data 1 MA3-18SP Construct data displays, including tables, column graphs, dot plots and line graphs, appropriate for the data type Describe and interpret data presented in tables, column graphs, dot plots and line graphs	Time 2 MA3-13MG Draw and interpret timelines using a given scale	Two-Dimensional Space 1 MA3-15MG Make and compare enlargements of shapes/pictures
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Content Cluster 23: Measurements are approximations and can be represented using formal units

Length 1 MA3-9MG Record lengths and distances using the abbreviations km, m, cm and mm Length 2 MA3-9MG Record lengths and distances using decimal notation to three decimal places	Area 1 MA3-10MG Record areas using the abbreviations km ² and ha	Volume and Capacity 1 MA3-11MG Record volumes using the abbreviations cm ³ and m ³ Volume and Capacity 2 MA2-11MG Record volumes and capacities using decimal notation to three decimal places Convert between millilitres and litres	Mass 1 MA3-12MG Recognise the need for tonnes to measure mass Record masses using the abbreviations t, kg and g Distinguish between 'gross mass' and 'net mass' Mass 2 MA3-12MG Record mass using decimal notation to three decimal places	Angles 1 MA3-16MG Recognise the need for formal units to measure angles Record angle measurements using the symbol for degrees (°) Construct angles using a protractor (up to 360°) Describe angle size in degrees for each angle classification
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Stage 3 Content Clusters

Content Cluster 24: The multiplicative structure (row and column) can be applied to measure area and volume

Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to multiply by one- and two-digit operators	Fraction and Decimals 2 MA3-7NA Use mental, written and calculator strategies to multiply decimals by one- and two-digit whole numbers	Area 1 MA3-10MG Develop a strategy to find areas of rectangles (including squares) and record the strategy in words Area 2 MA3-10MG Develop a strategy to find areas of triangles and record the strategy in words	Volume and Capacity 2 MA3-11MG Develop a strategy to find volumes of rectangular prisms and record the strategy in words	Three-Dimensional Space 2 MA3-14MG Construct prisms and pyramids using a variety of materials, and given drawings from different views
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Content Cluster 25: Objects can be measured and compared through different representations

Three-dimensional Space 1 MA3-14MG Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices Connect three-dimensional objects with their nets Three-Dimensional Space 2 MA3-14MG Construct prisms and pyramids using a variety of materials, and given drawings from different views	Volume and Capacity 1 MA3-11MG Use cubic centimetres and cubic metres to measure and estimate volumes Select and use appropriate units to measure volume Volume and Capacity 2 MA3-11MG Connect volume and capacity and their units of measurement Develop a strategy to find volumes of rectangular prisms and record the strategy in words	Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to multiply by one- and two-digit operators
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Stage 3 Content Clusters

Content Cluster 26: Shapes can be measured and compared through different representations

Two-Dimensional Space 1 MA3-15MG

Identify, name and draw right-angled, equilateral, isosceles and scalene triangles

Compare and describe side properties of the special quadrilaterals and special triangles

Explore angle properties of the special quadrilaterals and special triangles

Area 1 MA3-10MG

Develop a strategy to find areas of rectangles (including squares) and record the strategy in words

Area 2 MA3-10MG

Develop a strategy to find areas of triangles and record the strategy in words

Length 1 MA3-9MG

Find perimeters of common two-dimensional shapes and record the strategy

Angles 1 MA3-16MG

Measure, compare and estimate angles in degrees (up to 360°)

Describe angle size in degrees for each angle classification

Content Cluster 27: Shape and objects are classified based on their properties

Three-Dimensional Space 1 MA3-14MG

Name prisms and pyramids according to the shape of their 'base'
Recognise that prisms have a uniform cross-section and pyramids do not

Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices

Two-Dimensional Space 1 MA3-15MG

Identify, name and draw right-angled, equilateral, isosceles and scalene triangles

Compare and describe side properties of the special quadrilaterals and special triangles

Explore angle properties of the special quadrilaterals and special triangles

Classify and draw regular and irregular two-dimensional shapes from descriptions of their features

Identify line and rotational symmetries

Two-Dimensional Space 2 MA3-15MG

Identify, describe, compare and draw diagonals of two-dimensional shapes

Identify and name parts of circles

Angles 2 MA3-16MG

Identify and name angle types formed by the intersection of straight lines, including 'angles on a straight line', 'angles at a point' and 'vertically opposite angles'

Use known angle results to find unknown angles in diagrams

Stage 3 Content Clusters

Content Cluster 28: Grid references and coordinates can be used for locating and positioning

Position 1 MA3-17MG Use grid-referenced maps to locate and describe positions	Patterns and Algebra 2 MA3-8NA Locate and record the coordinates of points in all four quadrants of the Cartesian plane	Two-Dimensional Space 1 MA3-15MG Use the terms 'translate', 'reflect' and 'rotate' to describe transformations of shapes Make and compare enlargements of shapes/pictures Two-Dimensional Space 2 MA3-15MG Identify, use and describe combinations of translations, reflections and rotations	Three-Dimensional Space 2 MA3-14MG Construct prisms and pyramids using a variety of materials, and given drawings from different views
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Content Cluster 29: Information can be collected, analysed and interpreted using numbers (collecting data)

Data 1 MA3-18SP Collect categorical and numerical data by observation and by survey Describe and interpret data presented in tables, column graphs, dot plots and line graphs	Data 2 MA3-18SP Interpret and create two-way tables Interpret side-by-side column graphs Compare a range of data displays to determine the most appropriate display for particular sets of data Interpret and critically evaluate data presented in digital media and elsewhere	Chance 1 MA3-19SP List outcomes of chance experiments involving equally likely outcomes Chance 2 MA3-19SP Conduct chance experiments with both small and large numbers of trials	Addition and Subtraction 1 MA3-5NA Select and apply efficient mental, written and calculator strategies for addition and subtraction of numbers of any size	Multiplication and Division 1 MA3-6NA Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator
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Stage 3 Content Clusters

Content Cluster 30: Information can be presented visually to convey meaning (data representations and exploring bias)

Data 1 MA3-18SP Construct data displays, including tables, column graphs, dot plots and line graphs, appropriate for the data type	Data 2 MA3-18SP Interpret and create two-way tables Compare a range of data displays to determine the most appropriate display for particular sets of data	Angles 1 MA3-16MG Construct angles using a protractor (up to 360°)	Length 1 MA3-9MG Select and use appropriate instruments and units to measure lengths
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Content Cluster 31: Events can be predicted, compared, and analysed based on probability

Chance 1 MA3-19SP List outcomes of chance experiments involving equally likely outcomes	Chance 2 MA3-19SP Compare observed frequencies in chance experiments with expected frequencies Conduct chance experiments with both small and large numbers of trials	Data 1 MA3-18SP Collect categorical and numerical data by observation and by survey Describe and interpret data presented in tables, column graphs, dot plots and line graphs	Data 2 MA3-18SP Interpret and critically evaluate data presented in digital media and elsewhere
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Content Cluster 32: Probabilities of events can be described in a range of 0 – 1 (probabilities as fractions of a whole)

Chance 1 MA3-19SP Represent probabilities using fractions Recognise that probabilities range from 0 to 1	Chance 2 MA3-19SP Compare observed frequencies in chance experiments with expected frequencies Represent probabilities using fractions, decimals and percentages	Data 1 MA3-18SP Collect categorical and numerical data by observation and by survey	Fractions and Decimals 2 MA3-7NA Represent, compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100 Solve word problems involving fractions and decimals
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