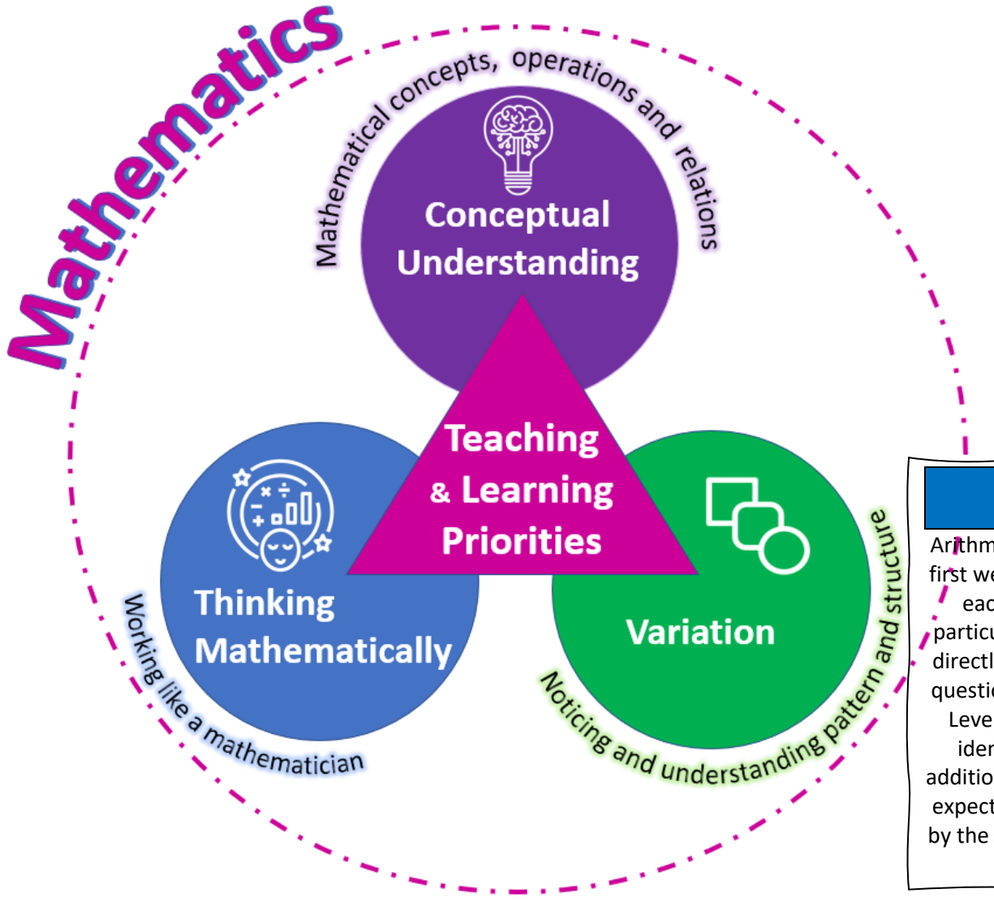
East Midlands Academy Trust
Curriculum Overview - Maths

Why Teach Mathematics?

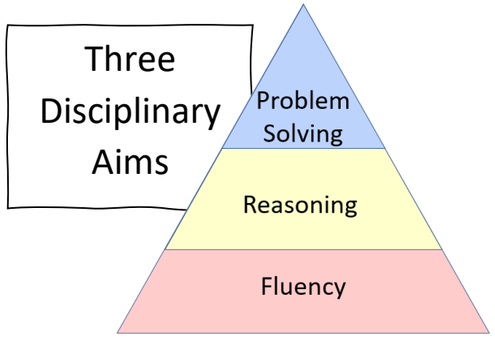
We believe that mathematics will allow students to establish life-long skills to make informed decisions and choices throughout their lives. Our curriculum aims to support children in securing conceptual understanding through:

- making rich connections across mathematical ideas to develop fluency, reasoning and solving increasingly sophisticated problems
- using concrete manipulatives to support conceptual understanding
- the use of variation to help children notice and understand pattern and structure
- fostering and maintaining a curiosity about mathematics in the world around us
- creative teaching approaches and rich tasks
- developing an appreciation of the beauty and elegance of mathematics
- applying their mathematical knowledge to other areas of the curriculum

We want our children to be able to think like mathematicians and provide them with the necessary financial literacy and mathematical knowledge in preparation for the next step in their educational journey and ultimate employment.

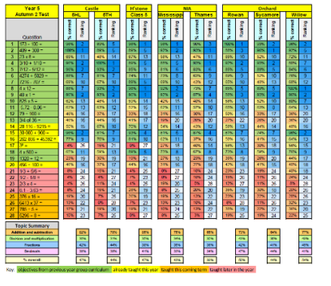


Substantive Topic & Year Taught	1	2	3	4	5	6
Number						
Calculations						
Fractions, Decimals, Percentages and Ratio						
Measures						
Time						
Geometry						
Position						
Statistics						
2a + 3 Algebra						



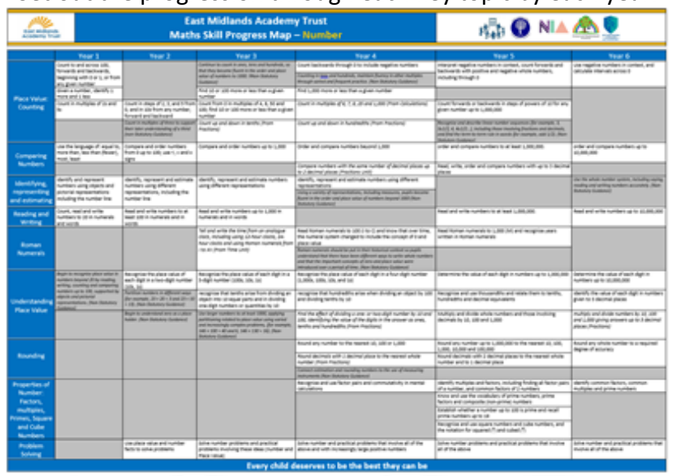
Arithmetic Focus

Arithmetic tests are taken in the first week of each half term with each question assessing a particular skill to show progress directly between corresponding questions in each test. Question Level Analysis (QLA) helps to identify where pupils need additional support to achieve the expected age-related objectives by the end of the academic year.



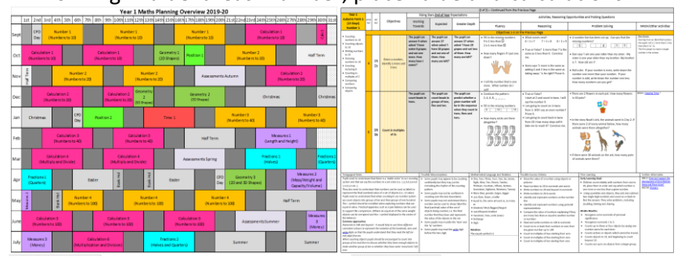
Curriculum Progression Maps by Topic

Set out the progression through each key topic by each year.



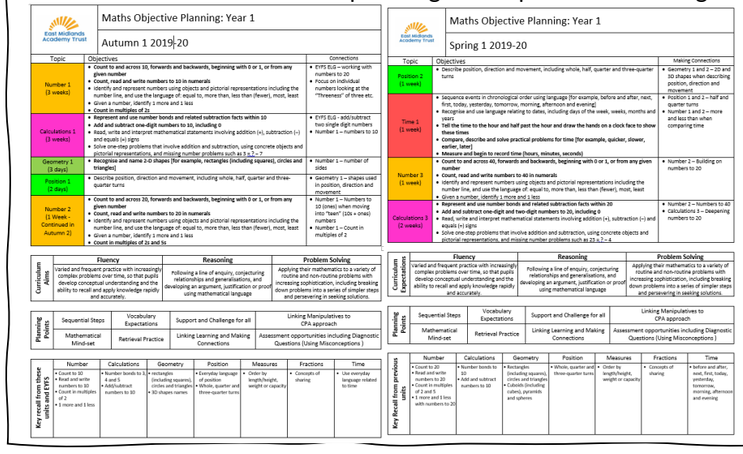
Long Term Planning and Scheme of Work

Details the sequencing of knowledge to build mathematical understanding systematically over time. This reflects a higher proportion of teaching time on 'high value' areas: number, place value and calculations.



Shorter Term Planning and Retrieval

Allows teachers to focus on planning the sequence of learning.



Reception Curriculum Map 2021-22 - Maths

Mathematics

Number | Numerical Patterns

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

		Autumn	Spring	Summer
Key Knowledge and Skills	Counting	- Begin to say numbers one after the other, some of which are in the right order (ordinality) - Recognise numerals that are personally significant - Begin to recognise numerals 0 to 5 - Point or touch (tags) each item when counting, saying one number for each item, using the stable order of 1,2,3,4 (one-to-one correspondence). Re-arranging objects to support this. - Use some number names and number language within play - Introduce larger numbers used in different contexts to encourage a fascination with large numbers - Understand the principle of order irrelevance when counting (it does not matter which object you start with when you begin to count and that the total remains the same.) - Understand the abstraction principle by counting different sized objects, treating them the same numerically, and counting things that can't be seen	- Begin to recognise numerals 0 to 10 - Point or touch (tags) each item, saying one number for each item, using the stable order of 1-10 (one-to-one correspondence) - Enjoy rote counting verbally as far as they can go - Enjoy reciting numbers from 0 to 10 (and beyond) and back from 10 to 0 - Start counting forwards and backwards from any given number - Increase confidence putting numerals in order 0 to 10 (ordinality)	- Confidently recognise numerals 0 to 10 - Confidently put numerals in order 0 to 10 (ordinality) - Verbally count beyond 20, recognising the pattern of the counting system
	Cardinality	- In everyday situations, take or give two or three objects from a group - Subitise one, two and three objects (without counting) - Count up to five items, recognising that the last number said represents the total counted so far (cardinal principle) - Link numerals with amounts up to 5 and maybe beyond - Explore using a range of their own marks and signs to which they ascribe mathematical meanings	- Engage in subitising numbers to four and maybe five - Count out up to 10 objects from a larger group	- Match the numeral with a group of items to show how many there are (up to 10) - Subitise (recognise quantities without counting) up to 5
	Comparison	- Begin to compare and recognise changes in numbers of things, using words like more, lots or 'same' - Compare two small groups of up to five objects, saying when there are the same number of objects in each group, e.g. You've got two, I've got two. Same!	- Use number names and symbols when comparing numbers, showing interest in large numbers - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity	- Estimates of numbers of things, showing understanding of relative size
	Composition	- Begin to use understanding of number to solve practical problems in play and meaningful activities - Through play and exploration, begin to learn that numbers are made up (composed) of smaller numbers - Begin to recognise that each counting number is one more than the one before - Separate a group of three or four objects in different ways, beginning to recognise that the total is still the same - Begin to understand zero	- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts and double facts) - Show awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects - In practical activities, add one and subtract one with numbers to 10	- Have a deep understanding of number to 10, including the composition of each number - Begin to conceptually subitise larger numbers by subitising smaller groups within the number, e.g. sees six raisins on a plate as three and three - Automatically recall (without reference to rhymes, counting or other aids) some number bonds to 10 (including subtraction facts and double facts) - Begin to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"
	Pattern	- Join in and anticipate repeated sound and action patterns - Express interest in what happens next using the pattern of everyday routines - Begin to sort objects to one attribute (e.g. colour, size) - Spot patterns in the environment - Join in with simple patterns in sounds, objects, games and stories dance and movement, predicting what comes next - Explore and add to simple linear patterns of two repeating items, e.g. stick, leaf (AB)	- Begin to identify the pattern "rule" (AB / ABC etc) - Create their own spatial patterns showing some organisation or regularity - Explore and add to simple linear patterns of three repeating items, e.g. stick, leaf, stone (ABC)	- Explore and represent pattens within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally - Choose familiar objects to create and recreate repeating patterns beyond AB patterns (e.g. ABB, ABBC), find errors in these patterns and begin to identify the unit of repeat
	Spatial Awareness	- Move own body and toys around objects and explore fitting into spaces - Begin to remember their way around familiar environments - Respond to spatial and positional language - Explore how things look from different viewpoints including things that are near or far away - Respond to and use language of position and direction - Predict, move and rotate objects to fit the space or create the shape they would like	- Investigate turning and flipping objects in order to make shapes fit and create models; predicting and visualising how they will look (spatial reasoning) - Recognise rotation - Bending and folding to explore properties of shapes	- Use spatial language, including following and giving directions, using relative terms and describing what they see from different viewpoints (forwards, backwards, up, down, left, right and turn) - Make simple maps of familiar and imaginative environments, with landmarks - Recognition of symmetry - Cutting of shapes to explore properties
	Shape	- Choose puzzle pieces and try to fit them into spaces - Recognise that two objects have the same shape - Make simple constructions - Choose items based on their shape which are appropriate for the purpose - Respond to and name common 2D and 3D shapes	- Develop awareness of shape similarities and differences between objects - Attempt to create arches and enclosures when building, using trial and improvement to select blocks - Partition and combine shapes to make new shapes with 2D and 3D shapes - Make patterns out of shapes	- Use informal language and analogies, (e.g. heart-shaped and hand-shaped leaves), as well as mathematical terms to describe shapes - Compose and decompose shapes, learning which shapes combine to make other shapes - Use own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build, describing properties - Recognise and count faces, vertices and edges in 3D shapes
	Measures	- Explore differences in sizes (big/small/medium) in length, weight and capacity e.g. "You're taller than me" - Talk about immediate past and future - Anticipate times of the day such as mealtimes or home time - In meaningful contexts, finds the longer or shorter, heavier or lighter and more/less full of two items - Recall a sequence of events in everyday life and stories	- Become familiar with measuring tools in everyday experiences and play - Compare different sizes of units (measuring the growth of sunflowers, filling different sized containers) - Use of non-standard units of measures, exploring and comparing units of different sizes - Order and sequence events using everyday language related to time (clocks, seasons, calendars)	- Enjoy tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy - Introduction of standard measures - link to measuring devices (accuracy, application of measuring devices) - Begin to experience measuring time with timers and calendars
	Statistics	- Forms sets in which objects in each set are identical and objects in the other sets are different - Follow verbal rules for sorting scaffolded by an adult. (These may be made with shifting criteria; nevertheless, they play an essential role in number, through the unitising process.) - "Fix" a simple sort with mistakes.	- Sort objects according to an explicit attribute. - Sort consistently by a single attribute and re-classify by different attributes. - Sort consistently and exhaustively by an attribute, given or created, and uses the terms "some" and "all." - Compare category frequencies (most and least popular). - Visually compares two graphs (pictograms, ten frames, tally charts, block diagrams, sorting diagrams e.g. Venn)	- Classify objects by multiple attributes in a single sort. "I'll put the big triangles here, the little ones next to them, then the big circles there and then the little circles." - Record the outcome of a sort - Counting in fives (tallying) - Make graphs by classifying and representing data in those categories (pictograms, ten frames, tally charts, block diagrams, sorting diagrams e.g. Venn) - Use of the language of probability e.g. more/less and predict outcomes
Number Early Learning Goal	Children at the expected level of development will: - Have a deep understanding of number to 10, including the composition of each number; - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.			
Numerical Patterns Early Learning Goal	Children at the expected level of development will: - Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.			

East Midlands Academy Trust
Maths Curriculum Map – EYFS & KS1

Fluency	Reasoning	Problem Solving

EYFS	KS1	Year 1	Year 2
Early Learning Goal: Number Children at the expected level of development will: – Have a deep understanding of number to 10, including the composition of each number; – Subitise (recognise quantities without counting) up to 5; – Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. **Early Learning Goal: Numerical Patterns** Children at the expected level of development will: – Verbally count beyond 20, recognising the pattern of the counting system; – Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; – Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. **Typical learning experiences include:** • Counting opportunities across environment, using concrete apparatus – eg fruit at snack time, jumps in a puddle, lunch boxes on the trolley etc. • Representing a total pictorially, with dots or a tally chart. • Recording opportunities e.g. in children's invented games recording score, who has more points. • Playing games with dice and dominos to recognise dot patterns. • Using concrete resources e.g. Numicon and matching to a numeral • Reading story books e.g. 3 bears to elicit discussions of size. Connecting learning of size throughout the curriculum e.g. plates in the home corner. • Sharing resources equally • Cooking, measuring ingredients, time. • Capacity – e.g. water/sand tray (counting embedded across these opportunities) • Measuring – e.g. comparisons between towers, between each other • Positional language – embedded across the curriculum e.g. we're going on a bear hunt • Time – visual timetable, talking about what comes next. Timers in activities (sand timers) or tidy up timers. • Shapes and patterns throughout the environment – exploring properties of 3D shapes in block play and construction area, junk modelling. Looking at patterns on animals, flowers, clothes etc. The curriculum map for EYFS shows the progression through Autumn to Summer in the following areas. • Counting • Cardinality • Comparison • Composition • Pattern • Spatial Awareness • Shape • Measures • Statistics	Number	• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • Count, read and write numbers to 100 in numerals • Count in multiples of 2s, 5s and 10s • Given a number, identify 1 more and 1 less • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • Read and write numbers from 1 to 20 in numerals and words	• Count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • Recognise the place value of each digit in a two-digit number (10s, 1s) • Identify, represent and estimate numbers using different representations, including the number line • Compare and order numbers from 0 up to 100; use <, > and = signs • Read and write numbers to at least 100 in numerals and in words • Use place value and number facts to solve problems
	Calculations	• Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • Represent and use number bonds and related subtraction facts within 20 • Add and subtract one-digit and two-digit numbers to 20, including 0 • Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9 • Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures • Solve problems with addition and subtraction applying their increasing knowledge of mental and written methods • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including a two-digit number and 1s, a two-digit number and 10s, 2 two-digit numbers and 3 one-digit numbers • Show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
	Fractions	• Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity • Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	• Recognise, find, name and write fractions 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity • Write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2
	Measures	• Compare, describe and solve practical problems for lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] • Measure and begin to record lengths and heights • Compare, describe and solve practical problems for mass/weight [for example, • heavy/light, heavier than, lighter than] • Measure and begin to record mass/weight • Compare, describe and solve practical problems for capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • Measure and begin to record capacity and volume • Recognise and know the value of different denominations of coins and notes	• Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • Compare and order lengths, mass, volume/capacity and record the results using >, < and = • Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • Find different combinations of coins that equal the same amounts of money • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
	Time	• Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] • Measure and begin to record time (hours, minutes, seconds) • Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • Recognise and use language relating to dates, including days of the week, weeks, months and years • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	• Compare and sequence intervals of time • Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • Know the number of minutes in an hour and the number of hours in a day
	Geometry	• Recognise and name 2-D shapes [for example, rectangles (including squares), circles and triangles] • Recognise and name3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	• Identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line • Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • Compare and sort common 2-D shapes and everyday objects • Compare and sort common 3-D shapes and everyday objects
	Position	• Describe position, direction, and movement, including whole, half, quarter and three-quarter turns	• Order and arrange combinations of mathematical objects in patterns and sequences • Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)
	Statistics		• Interpret and construct simple pictograms, tally charts, block diagrams and tables • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • Ask-and-answer questions about totalling and comparing categorical data

East Midlands Academy Trust
Maths Curriculum Overview - Primary

Number	Calculations	Fractions/Decimals/Percentages/Ratio	Measurement	Time	Geometry	Position	Statistics	Fraction Calculations	Algebra

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Autumn	Number 1	Number 1	Number 1	Number 1	Number 1	Number 1
	Calculation 1	Calculation 1	Calculation 1	Calculation 1	Calculation 1	Calculation 1
	Geometry 1 / Position 1			Measurement 1	Number 2	
	Number 2	Measurement 1	Measurement 1	Time 1	Statistics 1	Number 2
		Calculation 2	Calculation 2	Calculation 2	Calculation 2	FDPR 1
	Calculation 2	Statistics 1				Algebra 1
	Geometry 2	Position 1			Geometry 1	Geometry 1
						Position 1
Spring	Position 2	Geometry 1	Time 1	FDPR 1	Measurement 1	FDPR 1
	Time 1				Time 1	Fraction Calculations
	Number 3	Assessments	Calculation 3		FDPR 1	Assessments
	Calculation 3	Measurement 2		Statistics 2		Fraction Calculations
						Algebra 2
	Measurement 1	Time 1	Fractions 1	FDPR 2	FDPR 1	Geometry 2
	Calculation 4				Measurement 2	Measurement 2
	Assessments	Fractions 1	Assessments	Assessments	Assessments	
	Calculation 4		Fractions 1	FDPR 2	Measurement 2	
	Fractions 1		Geometry 1		Number 3	Statistics 1
Summer	Fractions 1	Measurement 3	Geometry 1	Measurement 2	Number 4	NC Test Preparation
	Geometry 3	Measurement 4	Statistics 1	Geometry 1	Position 1	
	Measurement 2	Measurement 5			Geometry 2	
	Number 4	NC Test Preparation	Fractions 2	Geometry 2		NC Test Administration
		NC Test Administration		Position 1	FDPR 2	Secondary Transition Scheme
	Calculation 5		Geometry 1	Measurement 3	Fraction Calculations	
	Calculation 5	Number 2	Geometry 1	Measurement 3	Fraction Calculations	Secondary Transition Scheme
			Measurement 2		Number 5	
	Measurement 3	Calculation 3		Time 2		
	Assessments		Assessments	Assessments	Assessments	
	Calculation 6	Statistics 2 / Geometry 2	Measurement 2	Statistics 3	Consolidation	
	Fractions 2	Consolidation	Consolidation	Consolidation		
	Consolidation					