Nursery, Year 5 and Year 6 Maths skills & knowledge

Nursery				
Autumn 1	Number songs	Colours	Match	Sort
	Opportunities for settling in, introducing the areas of provision and getting to know the children.	Children should be taught to recognise and name colours in a variety of contexts e.g. toys within the classroom, colours in nature, colours in the environment, matching colours, colours on themselves such as hair, skin, clothes. Children should be able to say when objects are and are not the same colour. Link to expressive art and design through painting.	Provide opportunities for the children to explore and match objects which are the same. Can you find one exactly like mine? How do you know it's the same? Can you find one different to mine? Why is this one not like mine?	Children learn that collections can be sorted into sets based on attributes such as colour, size or shape. Sorting enables the children to consider what is the same about all the objects in one set and how they are different to the other sets. They begin to understand that the same collection of objects can be sorted in different ways
Autumn 2	Compare amounts	Compare size, mass, capacity	Simple patterns	
	Once children can confidently sort collections into sets they learn that these sets can be compared and ordered. They understand that when making comparisons a set can have more, the same or fewer than another set. NOTE – it is easier for children to notice the difference between sets when the difference is greater. Start by asking the children to compare 2 and 5 rather than 5 and 6	Children learn that objects can be compared and ordered according to their size. Encourage the use of language such as big and little, small and large to describe a range of objects. More specific language such as tall, long, short can also be introduced.	Children copy, continue and create their own patterns. It is important to provide patterns with at least three full units of repeat. Encourage the children to say the pattern out loud	
Spring 1	Knowing Number 1	Weight	Knowing Number 2	

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	Children identify representations of 1, 2, 3. They subitise or count to find out how many and make their own collections of 1, 2 or 3 objects. They match the number names to quantities and numerals. They touch count in different arrangements and recognise the final number is the quantity of the set. Number blocks episode 1 Counting to 1 Finding 1 object Representing 1 on a 5 frame A circle – 1 sides shape (including in the environment) 1 action e.g. 1 hop, 1 jump, 1 clap What is 1 made of 1 nose, 1 mouth, 1 body Exploring different varieties of circles 1 being the first number, its position on a number line, ordinal numbers Numicon 1 Dice 1 Subitising 1 The numeral and formation of 1 Number 1 in the environment Representing 1 using marks, pictures and finger Matching numeral to quantity	Children may already have experience of weight through carrying heavy and light items. Encourage them to make direct comparisons holding items to estimate which feels the heaviest then use the balance scales to check. Prompt them to use the language heavy, heavier than, heaviest, light, lighter than, lightest to compare items starting with items that have an obvious difference in weight. Avoid common misconception that bigger items are always heavier by providing some small heavier items and some large lighter ones heavy, heavier than, heaviest, light, lighter than, lightest	Children identify representations of 1, 2, 3. They subitise or count to find out how many and make their own collections of 1, 2 or 3 objects. They match the number names to quantities and numerals. They touch count in different arrangements and recognise the final number is the quantity of the set. Number blocks episode 2 Counting to 2 Finding 2 objects Representing 2 on a 5 frame A semi circle – 2 sides shape (including in the environment) 2 actions e.g. 2 hops, 2 jumps, 2 claps What 2 is made of 1 is a part of me, 1 is a part of me and the whole of me is 2 2 being the second number, its position on a number line, ordinal numbers Numicon 2 Dice 2 Subitising 2 The numeral and formation of 2 Number 2 in the environment Representing 2 using marks, pictures and finger Matching numeral to quantity
Spring 2	**Knowing Number 3** Children identify representations of 1, 2, 3. They subitise or count to find out how many and make their own collections of 1, 2 or 3 objects. They match the number names to quantities and numerals. They touch count in different arrangements and recognise the final number is the quantity of the set. Number blocks episode 3 Counting to 3	**Length and height** Children begin by using language to describe length and height e.g. the tree is tall the pencil is short. When making direct comparisons they may initially say something is bigger than something else. Encourage them to use more specific mathematical vocabulary in relation to Length - longer, shorter height – taller, shorter Breadth – wider, narrower	**Knowing Number 4** Children count on and back to 4. They subitise sets of up to 4 objects to find out how many make their own collections of objects. They match the number to numerals and quantities and are able to say which sets have more and fewer items. When counting they continue to learn that the final number they say names the set.

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	Finding 3 objects Representing 3 on a 5 frame A triangle – 3 sides shape (including in the environment) 3 actions e.g. 3 hops, 3 jumps, 3 claps What is 3 made of - 2 is a part of me, 1 is a part of me and the whole of me is 3. Exploring different varieties and orientations of triangles. 3 being the third number, its position on a number line, ordinal numbers Numicon 3 Dice 3 Subitising 3 The numeral and formation of 3 Number 3 in the environment Representing 3 using marks, pictures and finger Matching numeral to quantity	The children should then move on to finding objects that are longer/shorter than a given item. They should be encouraged to utilise strategies such as direct comparison (e.g. placing objects side by side to determine which is longer). Encourage them to use more specific mathematical vocabulary in relation to Length - longer, shorter height – taller, shorter Breadth – wider, narrower	Number blocks episode 4 Counting to 4 Finding 4 objects Representing 4 on a 5 frame Squares and rectangles, 4 sided shapes including in the environment 4 actions e.g. 4 hops, 4 jumps, 4 claps Composition of 4 (2 is a part of me, 2 is a part of me and the whole of me is 4; 3 is a part of me, 1 is a part of me and the whole of me is 4) 4 being the fourth number, its position on a number line, ordinal numbers Numicon 4 Dice 4 Subitising 4 The numeral and formation of 4 Number 4 in the environment Representing 4 using marks, pictures and finger Matching numeral to quantity
Summer 1	**Knowing Number 5** Children continue to subitise up to 5 items and to count forwards and backwards to 5 accurately using the counting principles. They represent up to 5 items on a five frame. Number blocks episode 5 Counting to 5 Finding 5 objects Representing 5 on a 5 frame Pentagons, 5 sided shapes including in the environment 5 actions e.g. 5 hops, 5 jumps, 5 claps Composition of 5 (3 is a part of me, 2 is a part of me and the whole of me is 5; 4 is a part of me, 1 is a part of me and the whole of me is 5) 5 being the fifth number, its position on a number line, ordinal numbers Numicon 5	**1 more 1 less** The children will use real objects to see that the quantity of a group can be changed by adding more. The first, then, now structure can be used to create mathematical stories in meaningful contexts. Children continue to count, subitise and compare as they explore one more and one less. Prompt children to see the link between counting forwards and the one more pattern and back and the one less pattern.	**Shapes** The primary focus in relation shapes should be on the properties of shapes. For example, children should be encouraged to notice and describe shapes in the environment and talk about the properties using words such as 'straight/flat/round/ curved'. When teaching the names of shapes, wherever possible, real life shapes in the environment should be used. Note that only flat surfaces should be referred to as faces. Include sorting of natural shapes; the children may sort stones, for example, into sets that

	Dice 5 Subitising 5 The numeral and formation of 5 Number 5 in the environment Representing 5 using marks, pictures and finger Matching numeral to quantity		have straight edges, sets that have curved edges etc.
Summer 2	**My Day** Children talk about night and day and order key events in their daily routines, such as waking up, coming to school, dinner, bed time. They use language to describe when things happen e.g. day, night, morning, afternoon, before after, today, tomorrow. Encourage the vocabulary of first, next, then and possibly last. Children explore measuring time	**Capacity** Encourage children to build on their understanding of full and empty Provide opportunities to explore capacity with different materials such as water, sand, rice and loose parts Initially children should be exposed to the comparison of full, half full, empty using the same container. Provide different sized and shaped containers to investigate, When comparing capacities directly children can pour from one container to another to find which holds more or less water.	**Positional language** Children need opportunities to be exposed to and to use the language of position and direction; *Position: 'in', 'on', 'under'. Direction: 'up', 'down', 'across'* Children also need opportunities to use terms which are relative: *'in front of, 'behind', 'on top of'.* Create as many opportunities as possible to explore this language such as hunting for hidden objects with some prompts (e.g. look behind the shed).

Year 5			
Autumn 1	**Place Value** Number 10,000 Round to the nearest 10, 100 and 1000 Number to 100,000 Compare and order numbers to 100,000 Round numbers within 100,000 Number to million Counting in 10s, 100s, 10,000s and 100,000s	**Number: Addition and Subtraction** Add whole numbers with more than 4 digits (column method) Subtract two 4-digit numbers – more than one exchange Round to estimate and approximate Inverse operations (addition and subtraction) Multi-step addition and subtraction problems	**Statistics** Read and interpret line graphs Draw line graphs Use line graphs to solve problems Read and interpret tables Two-way tables

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	Compare and order numbers to one million Negative numbers Roman numerals to 1000		Timetables
Autumn 2	**Multiplication and division**	**Measurement: Perimeter & Area**	
	Multiples Factors Common Factors Prime Numbers Square Numbers Cube numbers Multiply by 10,100 and 1000 Divide by 10, 100 and 1000	Measure Perimeter Calculate perimeter Counting square Area of rectangles Area of compound shapes Area of irregular shapes	
Spring 1	**Number: Multiplication and division**	**Fractions**	
	Multiply 4 digits by 1 digit Multiply 2 digits (area model) Multiply 2 digits by 2 digits Multiply 3 digits by 2 digits Multiply 4 digits by 2 digits Divide 4 digits by 1 digit Divide with remainders	Equivalent fractions Fractions greater than 1 Improper fractions to mixed numbers Mixed numbers to improper fractions Number sequences Compare and order fractions less than 1 Compare and order fractions greater than 1 Add and subtract fractions Add fractions within 1 Add 3 or more fractions Add fractions Add mixed numbers	
Spring 2	**Fractions**	**Decimals and percentages**	
	Subtract fractions Subtract mixed numbers Subtract – breaking the whole Subtract 2 mixed numbers Multiply unit fractions by an integer Multiply non-unit fractions by an integer Multiply mixed numbers by integers Fraction of an amount	Decimals up to 2 d.p. Decimals as fractions (1) Decimals as fractions (2) Understand thousandths Thousandths as decimals Rounding decimals Order and compare decimals Understand percentages	

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	Using fractions as operators	Percentages as fractions and decimals Equivalent F.D.P.	
Summer 1	**Number: Decimal**	**Geometry: Properties of Shape**	
	Adding decimals within 1 Subtracting decimals within 1 Complements to 1 Adding decimals – crossing the whole Adding decimals with the same n° of decimal places Subtracting decimals with the same n° of decimal places Adding decimals with a different number of decimal places Subtracting decimals with a different number of decimal places Adding and subtracting wholes and decimals Decimal sequences Multiplying decimals by 10, 100 and 1,000 Dividing decimals by 10, 100 and 1,000	Measure angles in degrees Measuring with a protractor (1) Measuring with a protractor (2) Drawing lines and angles accurately Calculating angles on a straight line Calculating angles around a point Calculating lengths and angles in shapes Regular and irregular polygons Reasoning about 3-D shapes	
Summer 2	**Position & Direction**	**Geometry: Converting Units**	**Geometry: Volume**
	Position in the first quadrant Translation Translation with coordinates Reflection with coordinate	Kilometres Kilograms and kilometres Millimetres and millilitres Metric units Imperial units Converting units of time Timetables	What is volume? Compare volume Estimate volume Estimate capacity

Year 6			
Autumn 1	**Place Value**	**Calculate using 4 operations**	**Number Facts**
	Read, write, order and compare numbers to 10 million Multiply and divide integers and decimals by 10, 100 and 1000. Solve word problems by multiplying and dividing by 10, 100 and 1000 Convert between main units of g & KG	Written formal addition (showing awareness of mental or formal method) Calculate addition pairs mentally (strategy of 10.9.9.9) Multiply and divide numbers mentally (Related multiplication facts)	Recognise number sequences involving place value knowledge Investigate rules of divisibility Identify prime numbers less than 100; find the prime factors of two-digit numbers

	Round a set of numbers, including decimals up to thousandths Explain about powers of 10 Order and compare integers, decimals and negatives Find the difference between positive and negative integers	Use all four operations mentally efficiently Add and subtract integers and decimals using the formal method Multiply using the formal efficient method Learn the formal efficient methods of division Solve word problems using all four operations efficiently Apply knowledge of addition (cryptarithms)	Problem solve using factors of numbers using letters of the alphabet Problem solve using prime factors knowledge using letters of the alphabet
Autumn 2	**Properties of 2d & 3d shapes**	**Handling Data-**	**Efficient Calculating methods**
	Describe quadrilaterals using their properties Understand diagonals in quadrilaterals Draw nets with increasing accuracy Draw 3d shapes accurately using isometric grids Use a protractor to construct triangles Use a protractor to present data Represent and interpret linear sequences with missing numbers Calculate area and perimeter of complex rectilinear shapes Apply knowledge of area and perimeter Prove the formula for the area of triangles and parallelograms Find the Area of triangles and parallelograms Complete reflection of complex shapes	Create a line graph from own data collected, understanding continuous data Read and analyse information from a line graph. Construct and interpret combination bar charts Interpret pie charts Construct pie charts Complex bar line graphs Solve problems using a conversion graph Convert standard units of measures (litres) Convert mm to cm, m and km and vice versa Scale quantities up or down Read and interpret measuring scales Use data to find averages	Accurately calculate mentally with integers and decimals Add and subtract formally integers and decimals Multiply and divide formally integers & decimals Solve problems involving multi-step calculation using brackets
Spring 1	**Fractions, Decimals & Percentages**	**Fractions, Decimals & Percentages (Part 2)**	**Operations**
	LO: To find fractions of a number LO: To find percentages of a number Calculate the perimeter of rectilinear shapes; estimate the perimeter of an irregular shape Calculate the area of rectilinear shapes; estimate the area of an irregular shape Calculate the perimeter and area of irregular shapes;	Multiply using a factor method To choose efficient written methods to subtract integers and decimals Use a formal written method to multiply integers and decimals Solve problems involving multi-step calculations explaining method	Recall square numbers, square roots and cubed numbers Identify prime numbers less than 100; find the prime factors of two-digit numbers Show understanding of related factors and multiples

	Use the formula to calculate the area of triangles and parallelograms Find the highest common factor LO: To find the lowest common multiple Use knowledge of equivalent fractions (to be able to order them.) Convert improper and mixed number fractions Calculate fractions of shapes, amounts and quantities Add together 2 fractions Subtract two fractions Multiply two fractions Divide using a fraction Find percentages of amounts Count in fraction steps Prove calculations with fractions	Prove equivalence between fractions, decimals and percentage in diff contexts Use equivalences between f,d,p, including different contexts Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction Order fractions by converting to decimals Complete missing number sequences inc decimals Order numbers and complete inequalities Round numbers of decimals up to 3 places Solve problems involving missing fraction quantities To apply knowledge of fractions, decimals and percentages Find missing values linked to percentages Find related multiplication and division facts involving decimals	Test rules of divisibility to estimate and check results of missing number calculations Understand order of operations Calculate Knowledge of order of operations
Spring 2	**Properties and classifying 2d & 3d shapes**	**Pie charts & Conversions**	**Ratio & Averages**
	Describe, identify and visualise 2d shapes & 3d solids Construct 2D shapes using a protractor and set square Use the properties of a circle Solve area and perimeter problems Find the volume of cubes and cuboids Find the surface area of cubes and cuboids	Draw a conversion graph Read and interpret scales on a range of measuring instruments Investigate a range of measures problems Interpret pie charts Construct pie charts	Understand the concept of ratio Use ratio to solve basic problems Solve problems, using the mean Use bar charts to find the mode, median, mean and range Solve problems involving ratio Solve formula questions Calculate mentally with integers and decimals Efficient written methods to multiply integers and decimals Calculate money word problems using trial and improvement Record remainders as fractions, decimals or rounding

			Convert fractions to decimals Solve problems involving consecutive numbers
Summer 1	**Algebra**	**Coordinates, Reflections, Translations**	**Revision**
	Find a rule – one step Find a rule – two step Forming Expressions Substitution Using formulas Forming equations Solving one step equations Solving two step equations Find pairs of values with pictorial representation Find pairs of values	**Plan 14** Recognise parallel and perpendicular lines in 2D shapes. Calculate angles in regular polygons and on a straight line Estimate, measure and draw angles using a protractor Translate shapes using coordinates Reflect shapes around mirror lines including diagonals Solve ratio and proportion problems involving shapes Solve simple problems involving ratio and proportion Solve complex problems involving ratio and proportion Calculate the area and perimeters of a rectangle and triangles	Factors, Multiples & Prime Numbers Calculate using multiplication Translation To calculate Area & perimeter of polygons Properties of triangles Mean Negatives Estimate decimals and fractions on a number line To calculate money word problems Calculate angles on a straight line & polygons, and at a point Measures word problems Mixed number fractions Simplifying & equivalent fractions Converting fractions to decimals Addition & Subtraction of fractions Recap parts of a circle Identify missing multiple Division Strategies (Paper method) Percentages of amounts Estimate, measure & draw angles Properties of quadrilaterals Reflect and translate shapes using coordinates Solving algebraic formulas Roman Numerals Calculating with fractions Convert % to fractions & vice versa Time problems (including timetables) Creating pie charts Find fractions of amounts To answer questions about graphs & tables

			Identify the nets of 3D shapes Equations with 2 unknowns Identify missing multiples Recap over ratio and proportion
Summer 2	**Transition maths to prepare for KS3**		
	Rounding using significant figures Calculate mean, mode, range & median Read and write algebra Substituting into a formula Simplifying expressions Solving equations Identifying correlation on scatter graphs Calculate area and perimeter of complex shapes Calculate the volume and surface area of cuboids Isometric 3d drawings Budgeting		