

## **Thurlbear Maths**

Mathematics is an important life-skill that helps us to understand and change the world. We want all pupils at Thurlbear to experience the enjoyment of mathematics and develop a sense of curiosity about the subject with a clear understanding of key concepts. Maths at Thurlbear is geared towards supporting and inspiring children in becoming confident problem-solvers and to develop skills they can utilise across the curriculum and beyond school. To ensure learning sequences are as inclusive as possible, teachers will support children using a range of concrete, pictorial and abstract resources to enable all children to have a strong conceptual understanding of all areas of mathematics. Teachers will provide opportunities for all children to develop fluency, reasoning and problem solving in each lesson. The curriculum is underpinned by the fluent recall of key facts such as construction of numbers to 20 and the times tables.

Mathematics is delivered through the use of the **White Rose Maths** scheme of work and supplemented by the Curriculum Prioritisation from NCETM (National Curriculum Excellence Teaching Mathematics) and NRich to support, stretch and challenge all children in their classroom. These schemes have been adopted as they provide a clear progression of maths learning through the year groups, give regular CPD for staff members and delve deeply into the important steps of teaching maths in every year group. The mantra from White Rose Maths is 'Maths Everyone Can' and that is what we wish to deliver at Thurlbear School. Alongside the maths lessons, we also deliver discrete mental maths, starting from EYFS. These work in a progression format: NumberSense, times tables and arithmetic.

EYFS										
Phase	Number	Measure, Shape and Spatial Thinking								
	Getting to Know You									
Opportunities for	settling in, introducing the areas of provision and getting	to know the children								
	xploring the continuous provision inside and out. What d									
Just Like Me!	Match and sort	Compare size, mass and capacity								
	Compare amounts	Exploring Pattern								
It's Me 1, 2, 3!	Representing 1, 2 and 3	Circles and triangles								
	Comparing 1, 2 and 3	Positional language								
	Composition of 1,2 and 3									
Light and Dark	Representing numbers to 5	Shapes with 4 sides								
	One more and less	Time								
Alive in 5!	Introducing zero	Compare Mass (2)								
	Comparing numbers to 5	Compare Capacity (2)								
	Composition of 4 and 5									
Growing 6, 7, 8	6, 7, 8	Length and height								
	Combining two amounts	Time								
	Making pairs									
Building 9 and 10	Counting to 9 and 10	3D Shapes								
	Comparing numbers to 10	Patterns								
	Bonds to 10									
To 20 and Beyond	Building numbers beyond 10	Spatial reasoning (1)								
	Counting patterns beyond 10	Match, rotate and manipulate								
First Then Now	Adding more	Spatial reasoning (2)								
	Taking away	Compose and decompose								
Find my pattern	Doubling	Spatial reasoning (3)								
	Sharing and grouping	Visualise and build								
	Even and odd									
	Deepening understanding	Spatial Reasoning (4)								
On the Move	Patterns and relationships	Mapping								

### Year 1 – Year 6 Progression of National Curriculum Statements

Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and Place Value	<ul> <li>Read and write numbers from 1 to 20 in numerals and words</li> <li>Given a number, identify one more and one less</li> <li>Read and write numbers to 100 in numerals</li> <li>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>Count numbers to 100 in numerals; count in multiples of twos, fives and tens</li> <li>Identify and represent numbers using objects and pictorial representations</li> </ul>	Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward Read and write numbers to at least 100 in numerals and in words Identify, represent and estimate numbers using different representations, including the number line Recognise the place value of each digit in a two-digit number (tens, ones) Compare and order numbers from 0 up to 100; use and = signs Use place value and number facts to solve problems	Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number Identify, represent and estimate numbers using different representations Read and write numbers up to 1000 in numerals and in words Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) Compare and order numbers up to 1000 Solve number problems and practical problems involving these ideas	Count in multiples of 6, 7, 9, 25 and 1000 Count backwards through zero to include negative numbers Identify, represent and estimate numbers using different representations Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value Find 1000 more or less than a given number Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) Order and compare numbers beyond 1000 Round any number to the nearest 10, 100 or 1000 Solve number and practical problems that involve all of the above and with increasingly large positive numbers	Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Count forwards and backwards with positive and negative whole numbers, including through zero Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit Read Roman numerals to 1000 (M) and recognise years written in Roman numerals Interpret negative numbers in context Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 Solve number problems and practical problems that involve all of the above	Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit Round any whole number to a required degree of accuracy Use negative numbers in context, and calculate intervals across zero Solve number and practical problems that involve all of the above
Addition and Subtraction	Add and subtract one-digit and two digit numbers to 20, including zero Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:	<ul> <li>Add and subtract numbers mentally, including:</li> <li>a three-digit number and ones</li> <li>a three-digit number and tens</li> <li>a three-digit number and tens</li> <li>a three-digit number and hundreds</li> </ul>	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Solve addition and subtraction two-step problems in contexts,	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Add and subtract numbers mentally with increasingly large numbers	Perform mental calculations, including with mixed operations and large numbers Use their knowledge of the order of operations to carry out calculations involving the four operations

		Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods	formal written methods of columnar addition and subtraction Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	deciding which operations and methods to use and why	Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why Identify common factors, common multiples and prime numbers Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate
Multiplication and Division	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	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two digit numbers, using mental and progressing to formal written methods Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	Recall multiplication and division facts for multiplication tables up to 12 × 12 Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations Multiply two-digit and three- digit numbers by a one digit number using formal written layout Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square numbers and cube numbers, and the notation for squared ( <sup>2</sup> ) and cubed ( <sup>3</sup> ) Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for two- digit numbers Multiply and divide numbers mentally drawing upon known facts Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	degree of accuracy Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context Perform mental calculations, including with mixed operations and large numbers Solve problems involving addition, subtraction, multiplication and division Use their knowledge of the order of operations to carry out calculations involving the four operations

					Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	
Fractions (including decimals and percentages where relevant)	Recognise, find and name a half as one of two equal parts of an object, shape or quantity Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	Recognise, find, name and write fractions $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{2}{4}$ , $\frac{3}{4}$ of a length, shape, set of objects or quantity Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ Write simple fractions for example $\frac{1}{2}$ of 6 = 3	Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators Recognise and show, using diagrams, equivalent fractions with small denominators Compare and order unit fractions, and fractions with the same denominators Add and subtract fractions with the same denominator within one whole [for example $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ] Solve problems that involve all of the above	Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. Recognise and show, using diagrams, families of common equivalent fractions Add and subtract fractions with the same denominator Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number Recognise and write decimal equivalents of any number of tenths or hundredths Recognise and write decimal equivalents to $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ Round decimals with one decimal place to the nearest whole number	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ Compare and order fractions whose denominators are all multiples of the same number Add and subtract fractions with the same denominator and denominators that are multiples of the same number Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$ ] Recognise and use thousandths and relate them	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination Compare and order fractions, including fractions > 1 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ] Divide proper fractions by whole numbers [for example $\frac{1}{3} \div 2 = \frac{1}{6}$ Identify the value of each digit in numbers given to three decimal places Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a

				places up to two decimal places Solve simple measure and money problems involving fractions and decimals to two decimal places	to tenths, hundredths and decimal equivalents Round decimals with two decimal places to the nearest whole number and to one decimal place Read, write, order and compare numbers with up to three decimal places Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{2}{5}$ , $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25	simple fraction [for example, $\frac{3}{8}$ ] Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
Measure	Compare, describe and solve practical problems for: <ul> <li>lengths and heights</li> <li>mass/weight</li> <li>capacity and volume</li> <li>time</li> </ul> <li>Measure and begin to record the following:         <ul> <li>lengths and heights</li> <li>mass/weight</li> <li>capacity and volume</li> <li>time (hours, minutes, seconds)</li> </ul> </li>	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 =	Measure, compare, add and subtract: > lengths (m/cm/mm); > mass (kg/g); > volume/capacity (l/ml)	Convert between different units of measure [for example, kilometre to metre; hour to minute] Estimate, compare and calculate different measures	Convert between different units of metric measure Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 d.p. where appropriate Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 d.p. Convert between miles and kilometres
Money	Recognise and know the value of different denominations of coins and notes	Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value	Add and subtract amounts of money to give change, using both £ and p in practical contexts	Estimate, compare and calculate different measures, including money in pounds and pence	Use all four operations to solve problems involving measure [for example, money]	

		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	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	Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24- hour clocks Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight Know the number of seconds in a minute and the number of days in each month, year and leap year Compare durations of events [for example to calculate the time taken by particular events or tasks]	Read, write and convert time between analogue and digital 12- and 24-hour clocks Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	Solve problems involving converting between units of time	Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa
Perimeter area and Volume			Measure the perimeter of simple 2-D shapes	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres Find the area of rectilinear shapes by counting squares	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres Calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres (cm <sup>2</sup> ) and square metres (m <sup>2</sup> ) and estimate the area of irregular shapes Estimate volume [for example, using blocks to	Recognise that shapes with the same areas can have different perimeters and vice versa Recognise when it is possible to use formulae for area and volume of shapes Calculate the area of parallelograms and triangles Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm <sup>3</sup> ) and cubic

					build cuboids] and capacity [for example, using water]	metres (m <sup>3</sup> ), and extending to other units
Properties of shapes	Recognise and name common 2-D shapes [for example, rectangles (including squares), circles and triangles Recognise and name common 3-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 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 Recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] Compare and sort common 3-D shapes and everyday	Draw 2-D shapes Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Identify lines of symmetry in 2-D shapes presented in different orientations	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Use the properties of rectangles to deduce related facts and find missing lengths and angles Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Draw 2-D shapes using given dimensions and angles Compare and classify geometric shapes based on their properties and sizes Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius Recognise, describe and build simple 3-D shapes, including making nets
Angles and Lines			Recognise angles as a property of shape or a description of a turn Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	Identify acute and obtuse angles and compare and order angles up to two right angles by size Identify lines of symmetry in 2-D shapes presented in different orientations Complete a simple symmetric figure with respect to a specific line of symmetry	<ul> <li>Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</li> <li>Draw given angles, and measure them in degrees</li> <li>Identify: <ul> <li>angles at a point and one whole turn (total 360°)</li> <li>angles at a point on a straight line and <sup>1</sup>/<sub>2</sub> turn (total 180°)</li> <li>other multiples of 90°</li> </ul> </li> </ul>	Find unknown angles in any triangles, quadrilaterals, and regular polygons Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

Position and direction	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)		Describe positions on a 2-D grid as coordinates in the first quadrant Describe movements between positions as translations of a given unit to the left/right and up/down Plot specified points and draw sides to complete a given polygon	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	Describe positions on the full coordinate grid (all four quadrants) Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Statistic s		Interpret and construct simple pictograms, tally charts, block diagrams and simple tablesAsk and answer simple questions by counting the number of objects in each category and sorting the categories by quantityAsk and answer questions about totalling and comparing categorical data	Interpret and present data using bar charts, pictograms and tables Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	Complete, read and interpret information in tables, including timetables Solve comparison, sum and difference problems using information presented in a line graph	Interpret and construct pie charts and line graphs and use these to solve problems Calculate and interpret the mean as an average
Ratio and Proportion						Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts Solve problems involving the calculation/use of percentages for comparison Solve problems involving similar shapes where the scale factor is known or can be found Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

Algebra			

Use simple formulae
Generate and describe linear number sequences
Express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns
Enumerate possibilities of combinations of two variables

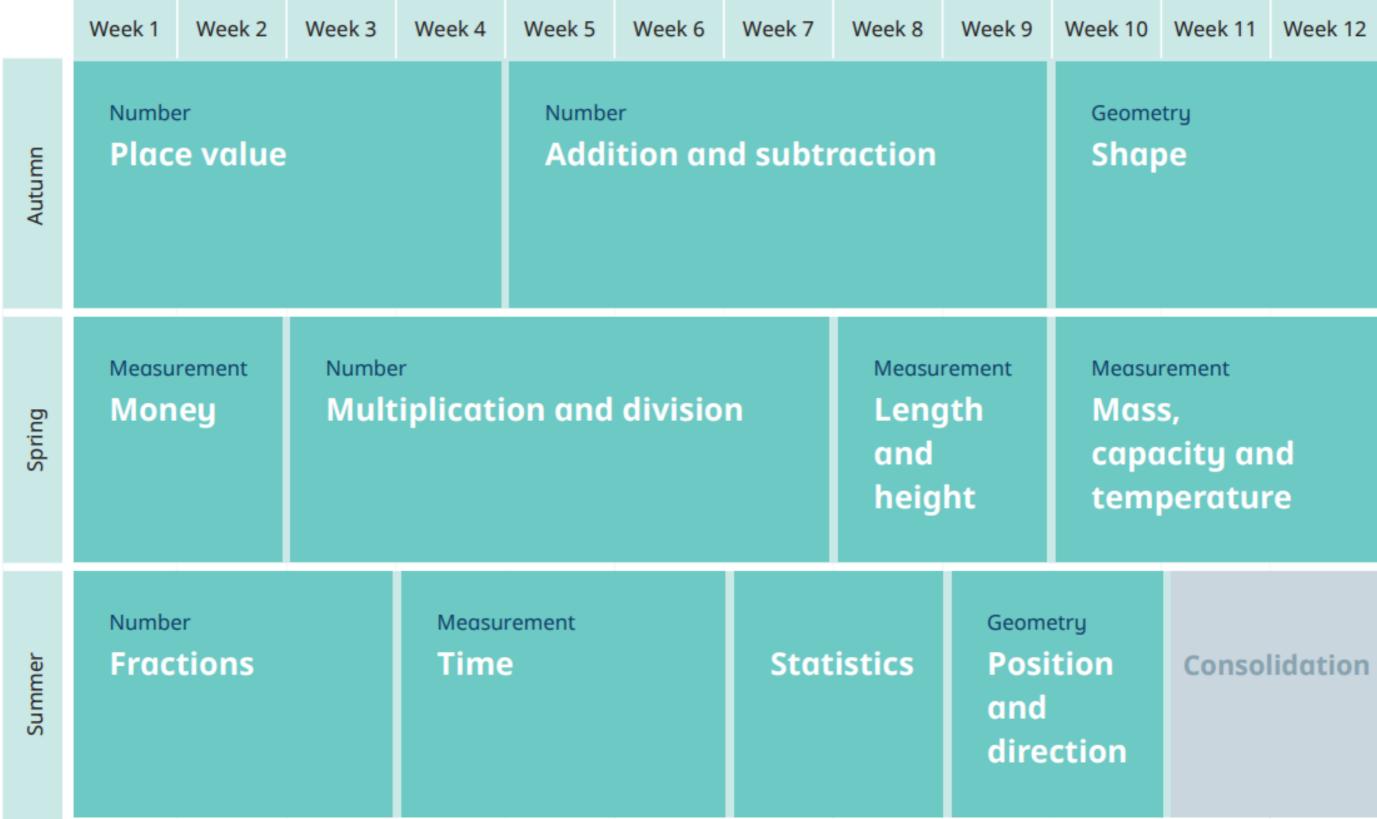
# Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

### EYFS

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Getting to Know You			Just Like Me!			lt's Me 1 2 3!			Light and Dark			Consolidation	
Spring	Al	ive in	5!		Growing 6, 7, 8			Building 9 and 10			Consolidation			
Summer		20 a Seyon		Fir	st Th Now	en		ind M Patteri	-	On The Move				

	Week 1	Week 1 Week 2 Week 3 Week 4 Week				Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value (within 10)					Number Addition and subtraction (within 10)					Consolidation	
Spring	Number Place (withi	value in 20)			ion and action in 20)	ł	Number Place value (within 50)			ment :h	Measure Mass and volun	
Summer		plicatio ivision		Number Fracti		Geometry Position and direction		value in 100)	Measurement <b>Money</b>	Measure Time	Measurement Time	



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week	
Autumn	Number Place value			Number Addition and subtraction					Number Multiplication and division A			
Spring	Number Multiplication and division B			Measurement Length and perimeter			Number Fractions A			Measure Mass and c		
Summer	Number Measure Fractions B Mone				Measurement Time			Geomet Shap	-	Statis	stics	

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Consolidation

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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Numbe Place	r e value			Number Addition and subtraction				Number Multiplication and division A			Consolidation
Spring	Mult	Number Measu Multiplication Leng and division B and peri				Number Fract			Number Decimals A			
Summer		Number Decimals B Money		Measure Time				-	Geometry Position and direction		ion	

	Week 1 Week 2 Week 3		Week 4 Week 5		Week 6 Week 7 Week 8		Week 9	Week 10	Week 11	Week 12		
Autumn	Number Place value			and	dition Multiplication			Number Fractions A				
Spring	Number Multiplication and division B			Number Fracti	ions B	Number Decimals and percentages			Measure Perim and a	eter	Statistics	
Summer	Geometry Shape		Geometr Positi and direct	on	Number Decimals		Number Negative numbers	Measurement Converting units		Measurement Volume		

	Week 1 Week 2 Week 3 Week		Week 4	Week 5 Week 6 Week 7			Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn	Number Place	value		ion, sul				Number Fractions A		Number Fractions B		Measurement Converting units
Spring	Ratio		Algeb	Algebra		nals	Number Fractions, decimals and percentages		Measurement Area, perimeter and volume		Statis	tics
Summer	Geometry Shape			Geometry Position and direction	Them	ed proj	ects, co	onsolid	ation a	nd prob	olem so	lving