

St Peter's Primary School



Maths skills progression

This progression document contains the National Curriculum's requirements for each year group. It has been produced using the NCETM progression maps, White Rose Maths and Power Maths scheme. The DFE (2020) Ready to Progress criteria has been included too in order to provide further guidance.

Date: February 2022

Review:

Place Value

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting						
verbally count beyond 20, recognising the pattern of the counting system	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
	count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1000 000	
	given a number, identify one more and one less	Find 10 more and 10 less than a 2 digit number	find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
Understanding place value and comparing 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	use the language of: equal to, more than, less than (fewer), most, least compare and order numbers from 0 up to 20 use <, > and = signs	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	recognise the place value of each digit in a three digit number (hundreds, tens, ones) compare and order numbers up to 1000	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	read, write, order and compare numbers up to 10 000000 and determine the value of each digit

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying, representing and estimating numbers including rounding						
subitise (recognise quantities without counting) up to 5.	identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers up to 100 using different representations, including the number line	identify, represent and estimate numbers using different representations up to 1000	identify, represent and estimate numbers using different representations up beyond 1000	determine the value of each digit in numbers up to 1,000, 000	determine the value of each digit in numbers up to 10, 000,000
compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity	<p>estimate position of numbers on 0-10 and 0-20 number line marking midpoints.</p> <p>reason about the location of numbers to 20 within the linear number system, including comparing using $<$ $>$ and $=$</p>	<p>estimate position of multiples of 10 on 0-100 number line linking to midpoint (50)</p> <p>reason about the location of any two digit number in the linear number system, including identifying the previous and next multiple of 10</p>	<p>identify previous and next multiples of 10 and hundred</p> <p>reason about the location of any three digit number in the linear number system, including identifying the previous and next multiple of 100 and 10</p>	<p>-round a 4 digit number to the nearest multiple of 1,000, 100 or 10.</p> <p>reason about the location of any four digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each</p>	<p>round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000'</p> <p>reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each</p>	<p>round any whole number to a required degree of accuracy</p> <p>reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts</p>

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Read and write numerals						
	<p>read and write numbers from 1 to 20 in numerals and words.</p> <p>read and write numbers to 100 in numerals</p>	<p>read and write numbers to at least 100 in numerals and in words</p>	<p>read and write numbers up to 1000 in numerals and in words</p> <p>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement)</p>	<p>read and write numbers up to 10,000</p> <p>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</p>	<p>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also</p> <p>read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</p>	<p>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)</p>
Problem Solving						
		<p>use place value and number facts to solve problems</p>	<p>solve number problems and practical problems involving these ideas.</p>	<p>solve number and practical problems that involve all of the above and with increasingly large positive numbers</p>	<p>solve number problems and practical problems that involve all of the above</p>	<p>solve number and practical problems that involve all of the above</p>

Ready to Progress Criteria: Place Value

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Begin to develop a sense of the number system by verbally counting forward to and beyond 20, pausing at each multiple of 10.	1NPV-1 Count within 100, forwards and backwards, starting with any number.	2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.	3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.	4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	5NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).
Play games that involve moving along a numbered track, and understand that larger numbers are further along the track.	1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using $<$ $>$ and $=$	2NPV-2 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.	3NPV-2 Recognise the place value of each digit in <i>three</i> -digit numbers, and compose and decompose <i>three</i> -digit numbers using standard and non-standard partitioning.	4NPV-2 Recognise the place value of each digit in <i>four</i> -digit numbers, and compose and decompose <i>four</i> -digit numbers using standard and non-standard partitioning.	5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.	6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.

			3NPV-3 Reason about the location of any <i>three</i> -digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.	4NPV-3 Reason about the location of any <i>four</i> -digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	5NPV-3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.
					5NPV-4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.	6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.

Addition and Subtraction

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Mental calculation						
<p>have a deep understanding of number to 10, including the composition of each number</p> <p>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</p>	<p>add and subtract one digit and two-digit numbers to 20, including zero</p>	<p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers and subtraction facts: add and subtract any 2 two digit numbers 	<p>add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds 	<p>add and subtract numbers mentally with increasingly large numbers</p>	<p>add and subtract numbers mentally with increasingly large numbers</p>	<p>add and subtract numbers mentally with increasingly large numbers</p>

Written calculation						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs	add using jottings moving to column by the end of the year if time	add and subtract numbers with up to three digits using a column method	add and subtract numbers with up to 4 digits using a column method.	add and subtract numbers	add and subtract numbers
Inverse operations, estimating and checking answers						
		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

Problem solving						
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = * - 9$</p>	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods 	<p>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</p>	<p>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</p>	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p>	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p>

Ready to Progress Criteria: Number Facts

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Begin to experience partitioning and combining numbers within 10.	1NF-1 Develop fluency in addition and subtraction facts within 10.	2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.	3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	4NF-1 Recall multiplication and division facts up to 12×12 , and recognise products in multiplication tables as multiples of the corresponding number.	5NF-1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	Recap previous content where appropriate.
Distribute items fairly, for example, put 3 marbles in each bag. Recognise when items are distributed unfairly.	1NF-2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.		3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	4NF-2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, for example: $74 \div 9 = 8 \text{ r } 2$ and interpret remainders appropriately according to the context.	5NF-2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth), for example: $8 + 6 = 14$ $0.8 + 0.6 = 1.4$ $0.08 + 0.06 = 0.14$ $3 \times 4 = 12$ $0.3 \times 4 = 1.2$ $0.03 \times 4 = 0.12$	
			3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10), for example: $80 + 60 = 140$ $140 - 60 = 80$			

			$30 \times 4 = 120$ $120 \div 4 = 30$			
			3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.			

Ready to Progress Criteria: Calculation

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understand the cardinal value of number words, for example understanding that 'four' relates to 4 objects. Subitise for up to 5 items. Automatically show a given number using fingers.	1AS-1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	2AS-1 Add and subtract across 10, for example: $8 + 5 = 13$ $13 - 5 = 8$	3AS-1 Calculate complements to 100, for example: $46 + ? = 100$	4MD-1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.	5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
Devise and record number stories, using pictures, numbers and symbols (such as arrows).	1AS-2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.	2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".	3AS-2 Add and subtract up to three-digit numbers using columnar methods.	4MD-2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	5MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.	6AS/MD-1 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.

		2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.	3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.	4MD-3 Understand and apply the distributive property of multiplication.	5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	6AS/MD-3 Solve problems involving ratio relationships.
		2AS-4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.			5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	6AS/MD-4 Solve problems with 2 unknowns.
		2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.				

		2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).				
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Multiplication and division

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting in multiples of numbers, Times table facts and properties of numbers						
explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally	count in multiples of twos, fives and tens (copied from Number and Place Value)	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward (	count from 0 in multiples of 4, 8, 50 and 100	count in multiples of 6, 7, 9, 25 and 1 000	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
		recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	<p>recap speed recall of 2, 5, and 10 multiplication tables including related division facts</p> <p>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p>	<p>rapid recall multiplication and division facts for multiplication tables up to 12×12</p> <p>recognise and use factor pairs and commutativity in mental calculations (repeated)</p>	<p>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 (non - prime) numbers</p> <p>establish whether a number up to 100 is prime and recall prime numbers up to 19</p> <p>recognise and use square numbers</p>	<p>identify common factors, common multiples and prime numbers use common factors to simplify fractions; use common multiples to express fractions in the same denomination</p> <p>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3) and extending to other</p>

					and cube numbers, and the notation for squared (²) and cubed (³)	units such as mm^3 and km^3
Mental Calculation						
			write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	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	multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
		show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		recognise and use factor pairs and commutativity in mental calculations	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)

Written Calculation						
		calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ($\times$), division ($\div$) and equals (=) signs	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two digit numbers times one digit numbers, using mental and progressing to formal written methods	multiply two digit and three digit numbers by a one digit number using formal written layout	<p>multiply numbers up to four digits by a one or two digit number using a formal written method including long multiplication for two digit numbers</p> <p>multiply and divide numbers mentally drawing upon known facts</p> <p>divide numbers up to four digits by a one digit number using formal written method of short division and interpret remainders</p>	<p>multiply multi digit numbers up to four digits by a two digit whole number using the formal written method of long multiplication</p> <p>divide numbers up to four 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</p>
Order of operations						
						use their knowledge of the order of operations to carry out calculations

						involving the four operations
Inverse operations, estimating and checking answers						
			estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

			Solve Problems			
	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 involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	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	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	<p>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</p> <p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p>	<p>rounding as appropriate for the context</p> <p>divide numbers up to four digits by a two digit number using the formal written method of short division where appropriate, interpreting remainders according to the context</p> <p>use written division methods in cases where the answer has up to two decimal places</p>

					solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	
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Measurement

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using measure						
	<p>compare, describe and solve practical problems for : lengths and height mass/weight capacity and volume time</p> <p>measure and begin to record the following: lengths and height mass/ weight capacity /volume time</p>	<p>choose and use appropriate standard units to estimate and measure length/ height in any direction mass temperature capacity to the nearest appropriate unit using rulers scales thermometers and measuring vessels</p> <p>compare and order Length, mass, volume/ capacity and record the results using > <and =</p>	<p>measure, compare, add and subtract lengths (m/cm/mm); mass (kg,g); volume/capacity (l/ml)</p>	<p>convert between different units of measure</p> <p>estimate compare and calculate different measures</p>	<p>convert between different units of metric measure</p> <p>understand and use approximate equivalence is between metric units an common imperial units such as inches pounds and pints</p> <p>use all four operations to solve problems involving measure using decimal notation including scaling</p>	<p>solve problems involving the calculation and conversion of units of measure using decimal notation up to three decimal places where appropriate</p> <p>use, read, write and convert between standard units converting measurements of length, mass, volume and time from a smaller unit of</p>

	(hours, minutes, seconds)					<p>measure to a larger unit and vice versa using decimal notations up to three decimal places</p> <p>convert between miles and kilometres</p>
	<p>compare, describe and solve practical problems for : lengths and height mass/weight capacity and volume time</p> <p>measure and begin to record the following: lengths and height mass/ weight capacity /volume time (hours, minutes, seconds)</p>	<p>choose and use appropriate standard units to estimate and measure length/ height in any direction mass temperature capacity to the nearest appropriate unit using rulers scales thermometers and measuring vessels</p> <p>compare and order Length, mass, volume/ capacity and record the results using > <and =</p>	<p>measure, compare, add and subtract lengths (m/cm/mm); mass (kg,g); volume/capacity (l/ml)</p>	<p>convert between different units of measure</p> <p>estimate compare and calculate different measures</p>	<p>convert between different units of metric measure</p> <p>understand and use approximate equivalence is between metric units an common imperial units such as inches pounds and pints</p> <p>use all four operations to solve problems involving measure using decimal notation including scaling</p>	

Money

	recognise and know the value of different denominations of coins and notes	recognise and use the symbols for pounds (£) and pence (p) combine amounts to make a particular value find different combinations of coins that equal the same amount of money solve simple problems in a practical context involving addition and subtraction of money of the same unit including giving change	add and subtract amount of money to give change using both pounds and pence in practical context	estimate, compare and calculate different measures including money in pounds and pence	use all four operations to solve problems involving measure for example money	
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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	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 the 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	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
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	<p>relating to dates, including days of the week, weeks, months and years</p> <p>tell time to the hour and half past the hour and draw hands on the clock face to show these times</p>		<p>terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm ,morning, afternoon, noon and midnight</p> <p>Know the number of seconds in a minute and the number of days in each month, year and leap year</p> <p>compare durations of events for example to calculate the time taken by a particular event or task</p>			
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Perimeter, Area, Volume

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<p>measure the perimeter of simple 2D shapes</p>	<p>measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>find the area of rectilinear shapes by counting squares</p>	<p>measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</p> <p>calculate and compare the area of rectangles including squares and including using standard units and estimate the area of irregular shapes</p> <p>estimate volume for example using one centimetre cubed blocks to build cuboids including cubes and capacity for example using water</p>	<p>recognise that shapes with the same area can have different perimeters and vice versa</p> <p>recognise when it is possible to use formulae for area and volume of shapes</p> <p>calculate the area of parallelograms and triangles</p> <p>calculate estimate and compare volume of cubes and cuboids using standard units including cubic centimetres and cubic metres and extending to other units</p>

Fractions

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting in Fraction steps						
		count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line	count up and down in tenths count up and down in	count up and down in hundredths		
Recognise and write fractions						
recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a half as one of two equal parts of an object, shape or quantity	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity		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 denominator	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten		
Comparing fractions						
			compare and order unit fractions, and fractions with the same denominator		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

Fractions calculations + -						
			add and subtract fractions with the same denominator within one whole (e.g. $5/7 + 1/7 = 6/7$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number recognise mixed numbers fractions and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $2/5 + 4/5 = 6/5 = 1\frac{1}{5}$)	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent recognise mixed numbers fractions
Fractions calculations x ÷						
					multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $1/4 \times 1/2 = 1/8$) multiply one-digit numbers with up to two decimal places by whole numbers

						divide proper fractions by whole numbers (e.g. $1/3 \div 2 = 1/6$)
			Decimals			
				compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
Rounding including decimals						
				round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
Equivalence (including fractions, decimals and percentages)						
		write simple fractions e.g. $1/2$ of $6 = 3$ and recognise the equivalence of $2/4$ and $1/2$.	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination

Multiplication and division of decimals

find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

multiply one-digit numbers with up to two decimal places by whole numbers

multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places

identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places

associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)

use written division methods in cases where the answer

						has up to two decimal places
			Problem solving			
				<p>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</p> <p>solve simple measure and money problems involving fractions and decimals to two decimal places.</p>	<p>solve problems involving numbers up to three decimal places</p> <p>solve simple measure and money problems involving fractions and decimals to two decimal places.</p>	

Ready to Progress Criteria: Fractions

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.	4F-1 Reason about the location of mixed numbers in the linear number system.	5F-1 Find non-unit fractions of quantities.	6F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions.
			3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency).	4F-2 Convert mixed numbers to improper fractions and vice versa.	5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system.	6F-2 Express fractions in a common denomination and use this to compare fractions that are similar in value.
			3F-3 Reason about the location of any fraction within 1 in the linear number system.	4F-3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers, for example: $\frac{7}{5} + \frac{4}{5} = \frac{11}{5}$ $3\frac{7}{8} - \frac{2}{8} = 3\frac{5}{8}$ $7\frac{2}{5} + \frac{4}{5} = 8\frac{1}{5}$ $8\frac{1}{5} - \frac{4}{5} = 7\frac{2}{5}$	5F-3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions.	6F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.
			3F-4 Add and subtract fractions with the same denominator, within 1.			

Geometry: Properties of Shapes

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying shapes and their properties						
	<p>recognise and name common 2-D and 3-D shapes, including:</p> <ul style="list-style-type: none"> * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]. 	<p>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p> <p>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</p> <p>identify 2-D shapes on the radius surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</p>		<p>identify lines of symmetry in 2-D shapes presented in different orientations</p>	<p>identify 3-D shapes, including cubes and other cuboids, from 2-D representations</p>	<p>recognise, describe and build simple 3-D shapes, including making nets</p>

Drawing and constructing

draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

complete a simple symmetric figure with respect to a specific line of symmetry

draw given angles, and measure them in degrees

draw 2-D shapes using given dimensions and angles

recognise, describe and build simple 3-D shapes, including making nets

Comparing and classifying

compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes

use the properties of rectangles to deduce related facts and find missing lengths and angles

distinguish between regular and irregular polygons based on reasoning about equal sides and angles

compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

Angles and lines

			recognise angles as a property of shape or a description of a turn		know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
			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 acute and obtuse angles and compare and order angles up to two right angles by size	identify: * angles at a point and one whole turn (total 360 degrees) * angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180 degrees) * other multiples of 90	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
			identify horizontal and vertical lines and pairs of perpendicular and parallel lines			

Geometry: Position and direction

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying shapes and their properties						
	describe position, direction and movement, including half, quarter and three-quarter turns.	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.
			Pattern			
		order and arrange combinations of mathematical objects in patterns and sequences				

Statistics

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Interpreting, Constructing and Presenting data						
		interpret and construct simple pictograms, tally charts, block diagrams and simple tables	interpret and present data using bar charts, pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems
		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				
Solving Problems						
			solve one-step and twostep questions [e.g. 'How many more?' and 'How many fewer?'] using information	solve comparison, sum and difference problems using information presented in bar charts,	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average

			presented in scaled bar charts and pictograms and tables	pictograms, tables and other graphs.		
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Geometry: Position and direction

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying shapes and their properties						
	describe position, direction and movement, including half, quarter and three-quarter turns.	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.
			Pattern			
		order and arrange combinations of mathematical objects in patterns and sequences				

Ratio and Proportion

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Work should be connected to previous learning linked to fractions, multiplication and division						
						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 of percentages [for example, of measures, and such as 15% of 360] and the 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.

Ready to Progress Criteria: Geometry

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Select, rotate and manipulate shapes for a particular purpose, for example:</p> <ul style="list-style-type: none"> • rotating a cylinder so it can be used to build a tower • rotating a puzzle piece to fit in its place 	<p>1G–1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.</p>	<p>2G–1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.</p>	<p>3G–1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.</p>	<p>4G–1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.</p>	<p>5G–1 Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.</p>	<p>6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.</p>
	<p>1G–2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.</p>	<p>2G–1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.</p>	<p>3G–2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.</p>	<p>4G–2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.</p>	<p>5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.</p>	
				<p>4G–3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.</p>		

Algebra

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Equations						
	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = * - 9$	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.	<p>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</p> <p>solve problems, including missing number problems, involving multiplication and division, including integer scaling</p>		use the properties of rectangles to deduce related facts and find missing lengths and angles	express missing number problems algebraically
		recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				find pairs of numbers that satisfy number sentences involving two unknowns

	represent and use number bonds and related subtraction facts within 20					enumerate all possibilities of combinations of two variables
Formulae						
				Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit.		use simple formulae recognise when it is possible to use formulae for area and volume of shapes
						use simple formulae recognise when it is possible to use formulae for area and volume of shapes
Sequences						
	sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening	compare and sequence intervals of time order and arrange combinations of mathematical objects in patterns from				generate and describe linear number sequences