

# Holy Cross Catholic Primary School



## Mathematics Progression Chart 2020 – 2021

*We care, we share, we value.*

Number and Place Value		<u>Nursery</u>	<u>Reception</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
	Counting	<p>count from 0-10</p> <p>Represent numbers with fingers</p> <p>Recognise anything can be used to count</p>	<p>count from 0-20</p> <p>count an irregular arrangement of up to 10 objects</p>	<p>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <p>count, read and write numbers to 100 in numerals</p> <p>count in multiples of twos, fives and tens given a number, identify one more and one less</p>	<p>count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward</p>	<p>count from 0 in multiples of 4, 8, 50 and 100</p> <p>find 10 or 100 more or less than a given number</p>	<p>count backwards through zero to include negative numbers</p> <p>count in multiples of 6, 7, 9, 25 and 1 000</p> <p>find 1 000 more or less than a given number</p>	<p>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</p> <p>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</p>	<p>use negative numbers in context, and calculate intervals across zero</p>
	Comparing Numbers	<p>compare two groups of objects</p>	<p>compare quantities of identical objects</p> <p>compare quantities of non-identical objects</p> <p>compare groups up to 10</p> <p>use the language of more than and fewer than</p>	<p>use the language of: equal to, more than, less than (fewer), most, least</p>	<p>compare and order numbers from 0 up to 100; use &lt;, &gt; and = signs</p>	<p>compare and order numbers up to 1 000</p>	<p>order and compare numbers beyond 1 000</p> <p>compare numbers with the same number of decimal places up to two decimal places</p>	<p>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</p>	<p>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</p>
	Identifying, representing and estimating numbers	<p>match numeral and quantity</p>	<p>select the correct numeral to represent 1-5, then 1-10 objects</p>	<p>identify and represent numbers using objects and pictorial representations including the number line</p>	<p>identify, represent and estimate numbers using different representations, including the number line</p>	<p>identify, represent and estimate numbers using different representations</p>	<p>identify, represent and estimate numbers using different representations</p>		
	Reading and writing numbers	<p>show an interest in writing numbers</p> <p>making to represent numbers</p>	<p>write the correct numeral for a given number</p>	<p>read and write numbers from 1 to 20 in numerals and words.</p>	<p>read and write numbers to at least 100 in numerals and in words</p>	<p>read and write numbers up to 1 000 in numerals and in words</p>	<p>read Roman numerals to 100 (I to C) and know that over time, the numeral system</p>	<p>read, write, order and compare numbers to at least 1 000 000 and</p>	<p>read, write, order and compare numbers up to</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</p>	<p>changed to include the concept of zero and place value.</p>	<p>determine the value of each digit</p> <p>read Roman numerals to 1 000 (M) and recognise years written in Roman numerals.</p>	<p>10 000 000 and determine the value of each digit</p>

	Understanding place value				recognise the place value of each digit in a two-digit number (tens, ones)	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)  find the effect of dividing a one- or twodigit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit  recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit  identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1 000 where the answers are up to three decimal places
	Rounding						round any number to the nearest 10, 100 or 1 000  round decimals with one decimal place to the nearest whole number	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000  round decimals with two decimal places to the nearest whole number and to one decimal place	round any whole number to a required degree of accuracy  solve problems which require answers to be rounded to specified degrees of accuracy
	Problem Solving				use place value and number facts to solve problems	solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above

# Addition and Subtraction

Addition and Subtraction		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Number bonds		Bonds to 5  Number bonds 10 (tens frame)  Number bonds to 10 (part-part whole model)	represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
	Mental Calculations		Find one more and one less  Combine two groups to find the whole  Adding by counting on  Subtract by counting back	add and subtract one-digit and twodigit numbers to 20, including zero  read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three onedigit numbers  show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		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
	Written methods			read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
	Inverse operaitons, estimating and checking answers				recognise and use the inverse relationship between addition and subtraction and use this to check	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	use estimation to check answers to calculations and determine, in the context of a
						calculations and solve missing number problems.			problem, levels of accuracy

	Problem Solving			<p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math></p>	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> <li>* using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>* applying their increasing knowledge of mental and written methods</li> </ul> <p>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p>	<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 multistep problems in contexts, deciding which operations and methods to use and why</p>	<p>solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why</p> <p>Solve problems involving addition, subtraction, multiplication and division</p>
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Multiplication and Division		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Multiplication and division facts		Doubling Halving and sharing Odds and evens	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 recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	<i>count from 0 in multiples of 4, 8, 50 and 100</i> recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	<i>count in multiples of 6, 7, 9, 25 and 1 000</i> recall multiplication and division facts for multiplication tables up to $12 \times 12$	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
	Mental calculations				show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for twodigit 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 recognise and use factor pairs and commutativity in mental calculations	multiply and divide numbers mentally drawing upon known facts multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	perform mental calculations, including with mixed operations and large numbers 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 twodigit numbers times one-digit numbers, using mental and progressing to formal written methods	multiply two-digit and three-digit numbers by a onedigit number using formal written layout	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 divide numbers up to 4 digits by a onedigit number using the formal written method of short division and interpret remainders appropriately for the context	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 twodigit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written

									<p>method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context</p> <p>use written division methods in cases where the answer has up to two decimal places</p>
	Properties of numbers: multiples, factors, primes, square and cube numbers						recognise and use factor pairs and commutativity in mental calculations	<p>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</p> <p>know and use the vocabulary of prime numbers, prime factors and composite (nonprime) 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 and cube numbers, and the notation for <math>\square</math> squared ( ) and <math>\text{cubed}</math> ( )</p>	<p>identify common factors, common multiples and prime numbers</p> <p>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 centimeter <math>\text{cm}^3</math> and cubic meters (m<sup>3</sup>), and extending to other units such as mm and km</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



	<b>Problem Solving</b>			<p>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</p>	<p>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</p>	<p>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</p>	<p>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>	<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>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</p>	<p>solve problems involving addition, subtraction, multiplication and division</p> <p>solve problems involving similar shapes where the scale factor is known or can be found</p>
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# Decimals and Percentages

		<u>Nursery</u>	<u>Reception</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
	Counting in fraction steps				Pupils should 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 hundredths		
	Reasoning fractions			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 $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{2}{4}$ 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 nonunit fractions with small denominators  recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.  recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
	Comparing fractions					compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions $>1$
	Comparing 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				<p>write simple fractions  <math>\frac{1}{2}</math>  e.g. <math>\frac{1}{2}</math> of 6 = 3 and  recognise the  equivalence of <math>\frac{2}{4}</math>  and <math>\frac{1}{2}</math></p>	<p>recognise and show,  using diagrams,  equivalent fractions  with small  denominators</p>	<p>recognise and show,  using diagrams,  families of common  equivalent fractions</p> <p>recognise and write  decimal equivalents of  any number of  tenths or hundredths</p> <p>recognise and write  decimal equivalents  <math>\frac{1}{4}</math> <math>\frac{1}{2}</math> <math>\frac{3}{4}</math>  to <math>\frac{1}{4}</math> ; <math>\frac{1}{2}</math> ; <math>\frac{3}{4}</math></p>	<p>identify, name and  write equivalent  fractions of a given  fraction, represented  visually, including  tenths and hundredths</p> <p>read and write decimal  numbers as fractions  (e.g. 0.71 = <math>\frac{71}{100}</math>)</p> <p>recognise and use  thousandths and  relate them to tenths,  hundredths and  decimal  equivalents</p> <p>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 as a  decimal fraction</p>	<p>use common factors  to simplify fractions;  use common  multiples to express  fractions in the same  denomination  associate a fraction  with division and  calculate decimal  fraction equivalents  (e.g. 0.375) for a  simple fraction (e.g. <math>\frac{3}{8}</math>)</p> <p>recall and use  equivalences between  simple fractions,  decimals and  percentages, including  in different contexts.</p>
	Addition and subtraction of decimals				<p>add and subtract  fractions with the  same denominator  within one whole  <math>\frac{5}{7}</math> <math>\frac{1}{7}</math> <math>\frac{6}{7}</math>  (e.g. <math>\frac{5}{7} + \frac{1}{7} = \frac{6}{7}</math>)</p>	<p>add and subtract  fractions with the  same denominator</p>	<p>add and subtract  fractions with the  same denominator</p>	<p>add and subtract  fractions with the  same denominator  and multiples of the  same number</p> <p>recognise mixed  numbers and improper  fractions and convert  from one form to the  other and write  mathematical  statements &gt; 1 as a  mixed number (e.g.  <math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}</math>)</p>	<p>add and subtract  fractions with  different  denominators and  mixed numbers,  using the concept of  equivalent fractions</p>

	Multiplication and division of fractions							multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	<p>multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>)</p> <p>multiply one-digit numbers with up to two decimal places by whole numbers</p> <p>divide proper fractions by whole numbers (e.g. <math>\frac{1}{3} \div 2 = \frac{1}{6}</math>)</p>
	Multiplicaiton and divition 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		<p>multiply one-digit numbers with up to two decimal places by whole numbers</p> <p>multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places</p> <p>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</p> <p>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. <math>\frac{3}{8}</math>)</p> <p>use written division methods in cases where the answer has up to two decimal placed</p>

	Problem Solving					<p>solve problems that involve all of the above</p>	<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 solve problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math> and <math>\frac{4}{5}</math> and those with a denominator of a multiple of 10 or 25.</p>	
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Ratio and Proportion		<u>Nursery</u>	<u>Reception</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
									<p>solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>solve problems involving similar shapes where the scale factor is known or can be found</p> <p>solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>

# Measurement

		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement	Comparing and estimating			<p>compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> <li>* lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half]</li> <li>* mass/weight [e.g. heavy/light, heavier than, lighter than]</li> <li>* capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]</li> <li>* time [e.g. quicker, slower, earlier, later]</li> <li>* sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</li> </ul>		<p>compare durations of events, for example to calculate the time taken by particular events or tasks</p> <p>estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)</p>	<p>estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)</p>	<p>calculate and compare the area of squares and rectangles including using standard units, square centimetres<sup>2</sup> (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes (also included in measuring)</p> <p>estimate volume<sup>3</sup> (e.g. using 1 cm blocks to build cubes and cuboids) and capacity (e.g. using water)</p>	<p>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre<sup>3</sup> cubed (cm<sup>3</sup>) and metres (m<sup>3</sup>) cubic, and extending to other units such as mm<sup>3</sup> and km<sup>3</sup>.</p>
	Measuring and calculating		<p>Daily routine</p> <p>Recognise length, height and distance</p> <p>Understand the difference between weight and capacity</p>	<p>measure and begin to record the following:</p> <ul style="list-style-type: none"> <li>* <b>lengths and heights</b></li> <li>* <b>mass/weight</b></li> <li>* <b>capacity and volume</b></li> <li>* <b>time</b> (hours, minutes, seconds)</li> </ul> <p>recognise and know the value of different denominations of coins and notes</p>	<p>choose and use appropriate standard units to estimate and measure <b>length/height</b> in any direction (m/cm); <b>mass</b> (kg/g); <b>temperature</b> (°C); <b>capacity</b> (liters/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels</p> <p>recognise and use symbols for pounds (£) and pence (p);</p>	<p>measure, compare, add and subtract: <b>lengths</b> (m/cm/mm); <b>mass</b> (kg/g); <b>volume/capacity</b> (l/ml)</p> <p>measure the <b>perimeter</b> of simple 2-D shapes</p> <p>add and subtract amounts of <b>money</b> to give change, using both £ and p in practical contexts</p>	<p>estimate, compare and calculate <b>different measures</b>, including <b>money in pounds and pence</b></p> <p>measure and calculate the <b>perimeter</b> of a rectilinear figure</p> <p>find the area of rectilinear shapes by counting squares</p>	<p>measure, compare, add and subtract: <b>lengths</b> (m/cm/mm); <b>mass</b> (kg/g); <b>volume/capacity</b> (l/ml)</p> <p>measure the <b>perimeter</b> of simple 2-D shapes</p> <p>calculate and compare the area of squares and rectangles including using standard units, square centimeters</p>	<p>estimate, compare and calculate <b>different measures</b>, including <b>money in pounds and pence</b></p> <p>measure and calculate the <b>perimeter</b> of a rectilinear figure</p> <p>calculate the area of parallelograms and triangles</p> <p>calculate, estimate and compare volume of cubes</p>

					<p>combine amounts to make a particular value</p> <p>find different combinations of coins that equal the same amounts of money</p> <p><b>solve simple problems</b> in a practical context involving addition and subtraction of money of the same unit, including giving change</p>			<p>(cm ) and square<sup>2</sup> meters (m ) and estimate the area of irregular shapes</p> <p>recognise and use square numbers and cube numbers, and the notation for<sup>2</sup> squared ( ) and cubed<sup>3</sup> ( )</p>	<p>and cuboids using standard units, including cubic<sup>3</sup> centimeters (cm ) and cubic meters<sup>3</sup> (m ), and extending to other units [e.g. <sup>3</sup> mm and km ].</p> <p>recognise when it is possible to use formulae for area and volume of shapes</p>
	Telling the time		<p>Daily routine</p> <p>Order and sequence events</p> <p>measure short periods of time</p>	<p>tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</p> <p>recognise and use language relating to dates, including days of the week, weeks, months and years</p>	<p>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.</p> <p>know the number of minutes in an hour and the number of hours in a day.</p>	<p>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12hour and 24-hour clocks</p> <p>estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight</p>	<p>read, write and convert time between analogue and digital 12 and 24hour clocks</p> <p>solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)</p>	<p>solve problems involving converting between units of time</p>	
	Converting				<p>know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)</p>	<p>know the number of seconds in a minute and the number of days in each month, year and leap year</p>	<p>convert between different units of measure (e.g. kilometer to meter; hour to minute)</p> <p>read, write and convert time between analogue and digital 12 and 24hour clocks</p>	<p>convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)</p>	<p>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</p>



							<p>solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days</p>	<p>solve problems involving converting between units of time</p> <p>understand and use equivalences between metric units and common imperial units such as inches, pounds and pints</p>	<p>notation to up to three decimal places</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>convert between miles and kilometers</p>
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# Geometry: Properties of shape

		<u>Nursery</u>	<u>Reception</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
<b>Identifying shapes and their properties</b>		talk about the shapes of everyday objects	recognise 2-D and 3-D shapes; using mathematical terms  selects a particular named shape	recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line  identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces  identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]		identify lines of symmetry in 2-D shapes presented in different orientations	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets  illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
	<b>Drawing and constructing</b>	show an interest in shape by playing with shapes	Make simple patterns  Explore more complex patterns			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
	<b>Comparing and classifying</b>	identify similarities of shapes in the environment	order two or three items by length and height  order two items by weigh or capacity		compare and sort common 2-D and 3-D shapes and everyday objects		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
	<b>Angles</b>					recognise angles as a property of shape or a description of a turn	identify acute and obtuse angles and compare and order angles up to two right angles by size	know angles are measured in degrees: estimate and compare acute,	recognise angles where they meet at a point, are on a straight line, or are vertically opposite,

						<p>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</p> <p>identify horizontal and vertical lines and pairs of perpendicular and parallel lines</p>		<p>obtuse and reflex angles</p> <p>identify:</p> <ul style="list-style-type: none"> <li>* angles at a point and one whole <math>^{\circ}</math> turn (total 360 )</li> <li>* angles at a point on a straight line and <math>\frac{1}{2}</math> a turn <math>^{\circ}</math> (total 180 )</li> <li>* other multiples of <math>^{\circ}</math> 90</li> </ul>	and find missing angles
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Position and direction		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Position, direction and movement	use positional language	describe the position of an object	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)		<p>describe positions on a 2-D grid as coordinates in the first quadrant</p> <p>describe movements between positions as translations of a given unit to the left/right and up/down</p> <p>plot specified points and draw sides to complete a given polygon</p>	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	<p>describe positions on the full coordinate grid (all four quadrants)</p> <p>draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>
	Pattern		Use common shapes to create patterns and build models		order and arrange combinations of mathematical objects in patterns and sequences				

Statistics		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Interpreting, constructing and presenting data				<p>interpret and construct simple pictograms, tally charts, block diagrams and simple tables</p> <p>ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>ask and answer questions about totalling and comparing categorical data</p>	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
	Solving problems					solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average

Algebra		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Equations			<p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and <b>missing number problems</b> such as <math>7 = \square - 9</math></p> <p>represent and use number bonds and related subtraction facts within 20</p>	<p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and <b>missing number problems</b>.</p> <p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p>	<p>solve problems, including <b>missing number</b> problems, using number facts, place value, and more complex addition and subtraction.</p> <p>solve problems, including <b>missing number</b> problems, involving multiplication and division, including integer scaling</p>		<p>use the properties of rectangles to deduce related facts and find <b>missing lengths and angles</b></p>	<p>express missing number problems algebraically</p> <p>find pairs of numbers that satisfy number sentences involving two unknowns enumerate all possibilities of combinations of two variables</p>
	Foemulae						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 <b>formulae</b> 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				Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit.

