

Crockerne Church of England Primary

Non-Negotiables

Mathematics skills should be taught when linked to projects where possible to ensure real world application



Key Skills

To be able to solve problems using a range of strategies.

To reason mathematically, following a line of enquiry.

Mathematical language and targets

Mathematics

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number (Number and Place Value)	<p>Recognise numbers of personal significance.</p> <p>Recognise number 1-5.</p> <p>Count up to 3 or 4 objects by saying a number name for each item.</p> <p>Can count actions or objects that cannot be moved.</p> <p>Can count objects to 10 and begin to count beyond 10.</p> <p>Can count 6 objects from a group.</p> <p>Select the correct</p>	<p>Count reliably with numbers from one to 20.</p> <p>Place numbers in order from 1-20.</p> <p>Say which is one more and one less than a given number.</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; count in multiples of 2s, 5s and 10s</p> <p>given a number, identify 1 more and 1 less.</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p>	<p>Count in steps of 2, 3 and 5 from zero and in tens from any number.</p> <p>Recognise the place value of any 2 digit number.</p> <p>Identify numbers and answers on a number line.</p> <p>Compare and order numbers from 0 up to 100 and use < > and = signs</p> <p>Read numbers to at least 100 in numerals and words.</p> <p>Use place value and number facts to solve problems</p>	<p>Count in multiples of 4, 8, 50 and 100.</p> <p>Find 10 and 100 more or less than a given number.</p> <p>Recognise the place value of 3 digit numbers.</p> <p>Order and compare numbers beyond 1000.</p> <p>Identify, represent and estimate numbers using different representations.</p> <p>Read roman numerals to 1000.</p> <p>Solve problems and practical problems using these ideas.</p>	<p>Count in multiples of 6, 7, 9, 25 and 1000.</p> <p>Find 1000 more or less than a given number.</p> <p>Recognise the place value of 4 digit numbers.</p> <p>Order and compare numbers beyond 1000.</p> <p>Round numbers to the nearest 10, 100 or 1000.</p> <p>Solve problems that involve all of the above.</p> <p>Read Roman numerals to 100.</p>	<p>Read, write an order numbers to 1,000,000 and know the value of each digit.</p> <p>Count forwards and backward in steps of 10 up to 1,000,000.</p> <p>Interpret negative numbers, counting forwards and backwards in steps of 10.</p> <p>Round up to the nearest number including some decimals.</p> <p>Read roman numerals to 1000 (M) and recognise years written in roman numerals</p>	<p>Read, write and order numbers to 10, 000,000 and know the value of each digit.</p> <p>Round any whole number accurately and to whole decimal places.</p> <p>Identify prime numbers and know how to calculate them.</p> <p>Use negative numbers in context, and calculate across zero.</p> <p>Solve number and practical problems confidently.</p>

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	numeral to represent 1-15 then 1-10.		Read and write numbers from 1 to 20 in numerals and words					
Number (Addition and subtraction)	<p>Can use the language of fewer and more to compare two sets of objects.</p> <p>Find total number of objects in two groups by counting.</p> <p>Say a number one more than a given number.</p> <p>Find one more or one less from a group of five objects, then 10.</p> <p>Use vocabulary of addition and subtraction.</p>	<p>Use objects to add and subtract two single digit numbers</p> <p>Count on and back to find the answers</p>	<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</p> <p>Represent and use number bonds and related subtraction facts within 20</p> <p>add and subtract one-digit and two-digit numbers to 20, including 0</p> <p>solve one-step problems that involve addition and subtraction, using concrete objects and</p>	<p>Use objects and pictorial representations to solve problems with addition and subtraction.</p> <p>Solve simple addition and subtraction questions mentally.</p> <p>Recall and use addition facts to 20 fluently and derive and use related facts up to 100.</p> <p>Add and subtract two digit numbers and ones, tens and then units.</p> <p>Add 3 one digit numbers.</p>	<p>Add and subtract up to 3 digit numbers mentally.</p> <p>Use a range of methods to calculate including column addition and subtraction..</p> <p>Estimate answers and use inverse operations.</p> <p>Solve problems including missing number problems, using number facts, place value and more complex addition and subtraction.</p>	<p>Add and subtract up to 4 digit numbers.</p> <p>Use a range of methods to calculate including column addition.</p> <p>Estimate answers and use inverse operations confidently.</p> <p>Solve a range of calculations, choosing the correct operation.</p>	<p>Add and subtract whole numbers with more than 4 digits using column addition and subtraction.</p> <p>Add and subtract large increasingly large numbers mentally.</p> <p>Add and subtract when solving multi-step problems and explain methods.</p>	<p>Solve problems involving addition and subtraction.</p> <p>Perform mental calculations quickly.</p> <p>Know how to solve multi step problems in a range of contexts.</p> <p>Use estimation to check the answers to calculations.</p>

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	Record using marks that they can interpret and explain.		pictorial representations, and missing number problems such as $7 = ? - 9$	Show that addition can be done in any order. Recognise that adding is the inverse of subtraction.				
Number (Multiplication and division)		Solve problems including doubling, halving and sharing	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 multiplication facts for the 2,5 and 10 times tables including odd and even numbers. Calculate simple multiplication and division using $\times /$ and $=$. Show that multiplication of 2 numbers can be done in any order, but division cannot. Show multiplication and division by using arrays, repeated addition, mental methods and problem solving.	Recall multiplication and division facts for the 3,4 and 8 multiplication tables. Use place value to multiply and divide mentally. Calculate and write multiplication and division, including for 2 digit times 1 digit numbers, using written methods. Solve word problems involving multiplying and dividing. Multiplication for	Recall multiplication facts to 12×12 . Use place value to multiply and divide mentally. Recognise and use factor pairs. Multiply and divide 2 and 3 digit numbers using written methods. Solve word problems involving multiplying and dividing.	Identify multiples and common factors of numbers. Know the vocabulary of prime numbers and composite numbers (non-prime) Calculate prime numbers up to 100 and recall prime numbers to 19. Recognise square and cube numbers and know how to calculate them. Multiply and divide 4 digits by a 1 or 2 digit number using formal written methods. Multiply and divide	Multiply up to 4 digit numbers using a range of methods including long multiplication. Divide up to 4 digit numbers and interpret as whole numbers. Divide up to 4 digit numbers by using short and long division. Perform mental calculations quickly. Identify common multiples and factors. Solve problems involving addition, subtraction, multiplication and division. Use estimation to check answers to calculations and determine, in the context of a problem.

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					solving problems where a letter represents a number, eg: $2n=10$ (where $n=5$)		mentally using known facts. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	
Number (Fractions and decimals)			Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	Recognise, name and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}$ and $\frac{3}{4}$ of a shape, length, set of objects or quantity. Write simple fractions and find values e.g. $\frac{1}{6}$ of 6 = 3	Count up and down in tenths. Divide and object into 10 equal parts. Divide one digit numbers or quantities by 10. Recognise, find and write fractions of numbers with denominators up to and including 10. Recognise and show equivalent fraction eg: $\frac{4}{8}=\frac{1}{2}$. Add and subtract fractions with the same denominator eg: $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$. Compare and order fractions with the same	Recognise and show equivalent fractions. Count up and down in hundredths and tenths. Add and subtract fractions with the same denominator. Recognise and write decimal equivalents to fractions. E.g. $\frac{1}{2}$ is 0.5 Round decimals to the nearest decimal place or whole number. Compare and order decimals with up to two decimal places. Solve simple measures i.e. money problems involving up to two decimal places.	Compare and order fractions confidently. Identify and find equivalent fractions and represent these visually, including tenths and hundredths. Add and subtract fractions (that are multiples of the same number) Multiply proper fractions by whole numbers. Read and write decimal numbers as fractions. Round decimals to the nearest whole number. Read, write and order numbers with up to	To order decimals and fractions using symbols $\lt \gt$ Use common factors to simplify fractions and express fractions. Compare and order fractions using $\gt \lt$ Add and subtract fractions with similar and mixed denominators. Multiply proper fractions by whole numbers. Divide proper fractions by whole numbers. Calculate fractions, decimals and percentages and know equivalences. Round all of the above to the nearest whole number or decimal place

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					denominator. Solve problems with all the above.		three decimal places. Write percentages as decimals and fractions. Solve problems by converting fractions to decimals.	
Measurement/ Geometry	<p>Can select a particular named shape.</p> <p>Order 2 or 3 lengths by length or height.</p> <p>Order 2 items by weight or capacity.</p> <p>Recreate patterns sung every day objects.</p> <p>Use language related to time.</p> <p>Use language related to money.</p>	<p>Use every day language to talk about size, weight, capacity, position, distance, time and money</p> <p>Compare quantities and objects</p> <p>Recognise, create, and describe patterns</p> <p>Explore characteristics of everyday objects</p> <p>Use mathematical language to describe shapes</p>	<p>Choose and use appropriate units to measure and estimate length/height (m/cm)</p> <p>Compare and order lengths, mass and volume/capacity.</p> <p>Recognise and use £ and p signs and make a value.</p> <p>Sequence events in chronological order using language</p> <p>Tell and write time accurately to the hour and half past the hour and</p>	<p>Choose and use appropriate standard units to measure and estimate length/height (m,cm); mass (kg/g), temperature (oC), capacity (ml/l) to the nearest unit using equipment.</p> <p>Compare and order the above using < and >.</p> <p>Recognise £ and p and combine amounts to make a particular value.</p> <p>Find different combinations of</p>	<p>Measure, compare, add and subtract lengths (m/cm/mm), mass (kg/g) and volume/capacity (l/ml)</p> <p>Measure the perimeter of simple 2D shapes.</p> <p>Add simple amounts of money to give change. Using both £ and p.</p> <p>Tell and write the time in an analogue clock including telling the time using roman numerals, and 12 and 24 hour clocks.</p> <p>Estimate time with accuracy to the nearest minute, hour, am, pm.</p>	<p>Convert between different units of measure (e.g. Kilometre to metre, hour to minute)</p> <p>Measure and calculate the area of squares and rectangles</p> <p>Know how to represent area by using cm².</p> <p>Find the area of shapes by counting squares.</p> <p>Estimate, compare and calculate different measures including pounds and pence.</p> <p>Read, write and convert time between analogue and digital 12 and 24 hour clocks and solve problems.</p>	<p>To convert between different units of measure eg kilometer and metre.</p> <p>Understand and know conversions between metric and imperial measurements.</p> <p>Measure and calculate the perimeter of simple shapes in centimetres and metres.</p> <p>Calculate and compare the area of rectangles.</p> <p>Estimate volume and capacity (e.g by using 1cm² blocks to estimate)</p> <p>Solve problems involving</p>	<p>Solve problems involving the converting measurements.</p> <p>Convert between standard units and metric including; length mass, volume and time.</p> <p>Convert between miles and kilometers.</p> <p>Recognise that shapes have the same area but different perimeters.</p> <p>Begin to calculate the volume of simple shapes and calculate compare and estimate the volume of cubes and cuboids.</p> <p>Calculate the area of parallelograms and triangles.</p> <p>Draw 2D shapes using simple angles.</p>

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	Order and sequence familiar events. Measure short periods of time in simple ways.		<p>Draw the hands on the clock face to show these times</p> <p>Recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]</p> <p>Describe position, direction and movement, including whole, half, quarter and three-quarter turns.</p>	<p>Coins that equal the same amount of money.</p> <p>Solve simple problems with addition and subtraction of money, including giving change.</p> <p>Compare and sequence intervals of time.</p> <p>Tell and write the time to five minutes, including quarter past and to and draw the hands of a clock to show those times.</p> <p>Know the number of minutes in an hour and the number of hours in a day.</p> <p>Identify the properties of 2D and 3D shapes, including the number of sides, edges, vertices and faces and a line of symmetry in a</p>	<p>Understand midnight and midday.</p> <p>Know the number of seconds in a minute and minutes in an hour.</p> <p>Know the number of days in each month and year and leap year.</p> <p>Draw 2D and some 3D shapes.</p> <p>Identify right angles and know they are 90 degrees.</p> <p>Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</p>	<p>Understand midnight and midday.</p> <p>Know the number of seconds in a minute and minutes in an hour.</p> <p>Know the number of days in each month and year and leap year.</p> <p>Draw 2D and some 3D shapes.</p> <p>Identify right angles and know they are 90 degrees.</p> <p>Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</p>	<p>Compare and classify geometric shapes including: quadrilaterals and triangles, based on proportions and sizes.</p> <p>Identify acute and obtuse angles and compare angles by size.</p> <p>Identify lines of symmetry in 2D shapes in different orientations.</p> <p>Describe positions on a grid in the first quadrant.</p> <p>Describe movements between positions and translations.</p> <p>Plot points to draw given shapes including polygons.</p>	<p>Converting units of time.</p> <p>Solve a range of problems involving measure including mass, length volume and money.</p> <p>Identify 3D shapes including cubes and cuboids from 2D representations.</p> <p>Know a range of angles and compare angle sizes.</p> <p>Draw given angle accurately</p> <p>Know angles on a point, whole turn and right angles.</p> <p>Use properties of rectangles to deduce facts and find missing lengths.</p> <p>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</p> <p>Identify, describe and represent the position</p>	<p>Build simple 3D shapes including nets.</p> <p>Find missing angles in a range of shapes.</p> <p>Illustrate and name parts of circles including radius, diameter and circumference.</p> <p>Calculate the averages of charts, including mean, median and mode.</p>

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				vertical line. Recognise a right angle. Describe position, direction and movement, including straight, clockwise and anti-clockwise turns.			of a shapes following reflection or translation.	
Probability, ratio and proportion	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Solve problems involving missing numbers where multiplication and division can be used. Solve problems involving the calculation of percentages and make comparisons using percentages. Solve problems involving similar shapes using scale factors. Solve problems involving unequal sharing and grouping.
Statistics	N/A	N/A	Interpret and construct simple pictograms where a picture is worth 1 unit.	Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present data in bar charts, pictograms and tables. Solve one and two step problems using information in scaled	Present data in a clear and concise way. Know how to construct bar charts and time graphs.	Complete read and interpret information in a range of tables, including timetables. Show comparisons, sum and difference problems	Represent statistics using graphs, grouped data and measures such as mean median and mode. Construct and interpret; pie charts, diagrams, frequency tables and bar charts.

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				<p>Answer questions by counting the number objects.</p> <p>Ask and answer questions about that involve comparing and totaling data.</p>	bar charts, pictograms and tables.	Solve problems by taking information from bar charts, pictograms, tables and other graphs	using information presented in a line.	Know the relationships between the variables when interpreting data.
Algebra	N/A	N/A	N/A	N/A	N/A	N/A		<p>To use simple formulae in algebra</p> <p>To generate and describe linear number sequences.</p> <p>To express missing number problems.</p> <p>Find pairs of numbers that satisfy an equation.</p> <p>Find possibilities of two calculations.</p>