



# Aberford C of E Primary School – KS2 Maths Curriculum

Updated Sept 2022

	Year 3	Year 4	Year 5	Year 6
	<u>Autumn</u>			
Autumn	<p style="text-align: center;"><u>Place value</u></p> <ul style="list-style-type: none"> <li>count from 0 in multiples of 4, 8, 50 &amp; 100; find 10 or 100 more or less than a given number.</li> <li>recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</li> <li>compare and order numbers up to 1000</li> <li>identify, represent and estimate numbers using different representations</li> <li>read &amp; write numbers up to 1000 in numerals and in words</li> <li>solve number problems &amp; practical problems involving these ideas.</li> </ul> <p style="text-align: center;"><u>Addition and subtraction</u></p> <ul style="list-style-type: none"> <li>add and subtract numbers mentally, including:               <ul style="list-style-type: none"> <li>a three-digit number and ones</li> <li>a three-digit number and tens</li> <li>a three-digit number &amp; hundreds</li> </ul> </li> <li>add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</li> <li>estimate the answer to a calculation and use inverse operations to check answers</li> <li>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</li> </ul> <p style="text-align: center;"><u>Multiplication and division (A)</u></p> <ul style="list-style-type: none"> <li>count in steps of 2, 3 and 5 from 0, and in 10s from any number forwards and backwards</li> <li>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</li> </ul>	<p style="text-align: center;"><u>Place value</u></p> <ul style="list-style-type: none"> <li>count in multiples of 6, 7, 9, 25 and 1000</li> <li>find 1000 more or less than a given number</li> <li>count backwards through zero to include negative numbers</li> <li>recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</li> <li>find 1 000 more or less than a given number</li> <li>order and compare numbers beyond 1000</li> <li>identify, represent and estimate numbers using different representations</li> <li>round any number to the nearest 10, 100 or 1 000</li> <li>solve number and practical problems that involve all of the above and with increasingly large positive numbers</li> <li>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.</li> </ul> <p style="text-align: center;"><u>Addition and subtraction</u></p> <ul style="list-style-type: none"> <li>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</li> <li>estimate and use inverse operations to check answers to a calculation</li> <li>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</li> </ul> <p style="text-align: center;"><u>Area</u></p> <ul style="list-style-type: none"> <li>find the area of rectilinear shapes by counting squares</li> </ul>	<p style="text-align: center;"><u>Place value</u></p> <ul style="list-style-type: none"> <li>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</li> <li>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</li> <li>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</li> <li>round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> <li>solve number problems and practical problems that involve all of the above</li> <li>read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> </ul> <p style="text-align: center;"><u>Addition and subtraction</u></p> <ul style="list-style-type: none"> <li>add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</li> <li>add and subtract numbers mentally with increasingly large numbers</li> <li>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</li> <li>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul> <p style="text-align: center;"><u>Multiplication and division (A)</u></p> <ul style="list-style-type: none"> <li>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</li> </ul>	<p style="text-align: center;"><u>Place value</u></p> <ul style="list-style-type: none"> <li>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</li> <li>round any whole number to a required degree of accuracy</li> <li>use negative numbers in context, and calculate intervals across zero</li> <li>solve number and practical problems that involve all of the above.</li> </ul> <p style="text-align: center;"><u>Addition, subtraction, multiplication and division</u></p> <ul style="list-style-type: none"> <li>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>solve problems involving addition, subtraction, multiplication and division</li> <li>use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</li> <li>identify common factors, common multiples and prime numbers</li> <li>multiply multi-digit numbers up to four digits by a 2-digit whole number using the formal written method of long multiplication</li> <li>perform mental calculations, including with mixed operations and large numbers</li> <li>divide numbers up to four digits by a 2-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context</li> <li>divide numbers up to four digits by a 2-digit whole number using the formal written method of long division, and</li> </ul>

- 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

#### Multiplication and division (A)

- recall multiplication and division facts for multiplication tables up to  $12 \times 12$
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- count in multiples of 6, 7, 9, 25 and 1000
- recognise and use factor pairs and commutativity in mental calculations

- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1 000
- multiply and divide numbers mentally, drawing upon known facts

#### Fractions (A)

- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements  $> 1$  as a mixed number [e.g.  $2/5 + 4/5 = 6/5 = 1 \text{ \& } 1/5$  ]
- compare and order fractions whose denominators are all multiples of the same number
- add and subtract fractions with the same denominator and denominators that are multiples of the same number

- interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- use their knowledge of the order of operations to carry out calculations involving the four operations

#### Fractions (A)

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions  $> 1$
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- identify common factors, common multiples and prime numbers

#### Fractions (B)

- multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g.  $1/4 \times 1/2 = 1/8$ ]
- divide proper fractions by whole numbers [e.g.  $1/3 \div 2 = 1/6$ ]
- associate a fraction with division and calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g.  $3/8$ ]

#### Converting units

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places

## Spring

Spring

### Multiplication and division (B)

- 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
- 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.

### Length and perimeter

- measure, compare, add and subtract: lengths (m/cm/mm)
- measure the perimeter of simple 2-D shapes

### Fractions (A)

- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- recognise, find and write fractions of a discrete set of objects: unit fractions and non unit fractions with small denominators
- compare and order unit fractions, and fractions with the same denominators
- recognise and use fractions as numbers: unit fractions and non unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators

### Mass and capacity

- measure, compare, add and subtract: mass (kg/g); volume/capacity (l/ml)

### Multiplication and division (B)

- recognise and use factor pairs and commutativity in mental calculations
- recall multiplication and division facts for multiplication tables up to  $12 \times 12$
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1 000
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as  $n$  objects are connected to  $m$  objects
- 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

### Length and perimeter

- convert between different units of measure (for example, kilometre to metre; hour to minute)
- measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
- perimeter of polygons

### Fractions

- explore fractions greater than 1
- represent mixed numbers on a number line
- compare and order mixed numbers
- convert mixed numbers to improper fractions
- recognise and show, using diagrams, families of common equivalent fractions
- count up and down in hundredths; recognise that hundredths arise when

### Multiplication and division (B)

- multiply numbers up to 4 digits by a 1- or 2-digit number using a formal written method, including long multiplication for 2-digit numbers
- divide up to 4 digits by a 1-digit number using the formal method of short division and interpret remainders appropriately for the context
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes

### Fractions (B)

- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

### Decimals and percentages

- read and write decimal numbers as fractions [e.g.  $0.71 = 71/100$ ]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- solve problems which require knowing percentage and decimal equivalents of  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{4}{5}$  and those fractions with a denominator of a multiple of 10 or 25
- read, write, order and compare numbers with up to three decimal places
- solve problems involving number up to three decimal places
- round decimals with two decimal places to the nearest whole number and to one decimal place
- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal

### Ratio

- 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

### Algebra

- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.

### Decimals

- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal place
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy

### Fractions, decimals and percentages

	<ul style="list-style-type: none"> <li>dividing an object by one hundred and dividing tenths by ten</li> <li>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</li> <li>add and subtract fractions with the same denominator</li> </ul> <p style="text-align: center;"><u>Decimals (A)</u></p> <ul style="list-style-type: none"> <li>recognise and write decimal equivalents of any number of tenths or hundredths</li> <li>compare numbers with the same number of decimal places up to 2 decimal places</li> <li>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</li> <li>recognise and write decimal equivalents to <math>\frac{1}{4}</math>, <math>\frac{1}{2}</math>, <math>\frac{3}{4}</math></li> </ul>	<p style="text-align: center;"><u>Perimeter and area</u></p> <ul style="list-style-type: none"> <li>measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</li> <li>calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes</li> </ul> <p style="text-align: center;"><u>Statistics</u></p> <ul style="list-style-type: none"> <li>solve comparison, sum and difference problems using information presented in a line graph</li> <li>complete, read and interpret information in tables, including timetables.</li> </ul>	<ul style="list-style-type: none"> <li>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</li> <li>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>]</li> <li>recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</li> <li>compare and order fractions, including fractions &gt; 1</li> <li>solve problems involving the calculation of percentages and the use of percentages for comparison</li> </ul> <p style="text-align: center;"><u>Area, perimeter and volume</u></p> <ul style="list-style-type: none"> <li>recognise that shapes with the same areas can have different perimeters and vice versa</li> <li>recognise when it is possible to use formulae for area and volume of shapes</li> <li>calculate the area of parallelograms and triangles</li> <li>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm<sup>3</sup>) and cubic metres (m<sup>3</sup>), and extending to other units [for example, mm<sup>3</sup> and km<sup>3</sup>].</li> </ul> <p style="text-align: center;"><u>Statistics</u></p> <ul style="list-style-type: none"> <li>interpret and construct pie charts and line graphs and use these to solve problems</li> <li>calculate and interpret the mean as an average.</li> </ul>
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Summer

<b>Summer</b>	<p style="text-align: center;"><u>Fractions (B)</u></p> <ul style="list-style-type: none"> <li>recognise and show, using diagrams, equivalent fractions with small denominators</li> <li>add and subtract fractions with the same denominator within one whole [e.g. <math>\frac{5}{7} + \frac{1}{7} = \frac{6}{7}</math>]</li> </ul>	<p style="text-align: center;"><u>Decimals (B)</u></p> <ul style="list-style-type: none"> <li>round decimals with one decimal place to the nearest whole number</li> <li>compare numbers with the same number of decimal places up to two decimal places</li> </ul>	<p style="text-align: center;"><u>Shape</u></p> <ul style="list-style-type: none"> <li>identify 3-D shapes, including cubes and other cuboids, from 2-D representations</li> <li>know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</li> </ul>	<p style="text-align: center;"><u>Shape</u></p> <ul style="list-style-type: none"> <li>draw 2-D shapes using given dimensions and angles</li> <li>recognise, describe and build simple 3-D shapes, including making nets</li> <li>compare and classify geometric shapes based on their properties and sizes and</li> </ul>
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- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

#### Money

- add and subtract amounts of money to give change, using both £ and p in practical contexts

#### Time

- tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight
- know the number of seconds in a minute and the number of days in each month, year and leap year
- compare durations of events [e.g. to calculate the time taken by particular events or tasks].

#### Shape

- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- identify right angles, recognise that two right angles make a half turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines

#### Statistics

- interpret and present data using bar charts, pictograms & tables

- solve simple measure and money problems involving fractions and decimals to two decimal places.

#### Money

- estimate, compare and calculate different measures, including money in pounds and pence

#### Time

- 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.

#### Shape

- compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- identify acute and obtuse angles and compare and order angles up to two right angles by size
- identify lines of symmetry in 2-D shapes presented in different orientations
- complete a simple symmetric figure with respect to a specific line of symmetry

#### Statistics

- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

- draw given angles, and measure them in degrees (o)
- identify: angles at a point and one whole turn (total 360o ); angles at a point on a straight line and ½ a turn (total 180o ); other multiples of 90

- 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

#### Position and direction

- 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.

#### Decimals & Negative numbers

##### Converting Units

- convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [e.g. length, mass, volume, money] using decimal notation, including scaling.

#### Volume

- estimate volume [e.g. using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)] and capacity [e.g. using water]

find unknown angles in any triangles, quadrilaterals, and regular polygons

- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

#### Position and direction

- describe positions on the full coordinate grid (all four quadrants)
- draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

#### Consolidation & themed projects

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|  | <ul style="list-style-type: none"><li>• solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.</li></ul> |  |  |  |
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