



## Gnosall St Lawrence CE Primary Academy Maths Curriculum Statement

<b>Intent</b>	<p>The Gnosall St Lawrence CE Primary Academy mathematics curriculum is designed to equip children with the necessary skills, knowledge and resilience needed for later life. Through varied and high-quality activities, we focus on the development of fluency, reasoning and problem solving skills at all stages. Pupils are required to explore mathematics in depth, using appropriate vocabulary to reason logically and explain their ideas. A range of mathematical resources are used in order to aid learning, with children developing familiarity with concrete, pictorial and abstract forms. Working in partnership with families and the local community, we seek opportunities to provide informative workshops and home-learning opportunities.</p>			
	<b>Fluency</b>	<b>Problem solving</b>	<b>Reasoning</b>	<b>Vocabulary</b>
	<p>Pupils will become fluent in the fundamentals of mathematics to allow for the development of conceptual understanding and the ability to recall and apply knowledge accurately.</p>	<p>Pupils will solve problems, including single and multi-step work, by applying their mathematics to a range of contexts.</p>	<p>Pupils will follow lines of enquiry, using age-appropriate vocabulary, developing justifications and proof in order to reason mathematically.</p>	<p>Pupils will work within a vocabulary-rich environment, where talk for maths is promoted and becomes a key learning tool.</p>

### Early Years Foundation Stage

In the Early Years Foundation Stage, children are provided with daily opportunities (through planned, purposeful play and a mixture of adult-led and child-initiated activity) to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, space and measure.

The three stages which Early Years Foundation Stage practitioners are required to reflect upon when planning (playing and exploring, active learning and creating/thinking critically) are subsequently built upon throughout Key Stage 1 and Key Stage 2 mathematics sessions. Children further develop these areas throughout school by investigating different possibilities/solutions, using concrete resources and developing/selecting strategies of choice.

***EYFS pupils at Gnosall St. Lawrence CE Primary Academy are taught to:***

#### Mathematical Vocabulary

<b>Implementation</b>	Three and Four-Year-Olds	Communication and Language	<ul style="list-style-type: none"> <li>• Use a wider range of vocabulary.</li> <li>• Understand 'why' questions, like: "why do you think the caterpillar is so fat?"</li> </ul>	
	Reception	Communication and Language	<ul style="list-style-type: none"> <li>• Learn new vocabulary.</li> <li>• Use new vocabulary throughout the day.</li> </ul>	
	ELG	Communication and Language	Speaking	<ul style="list-style-type: none"> <li>• Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.</li> </ul>

## Number and Place Value

### Counting

Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Recite numbers past 5.</li> <li>Say one number name for each item in order: 1, 2, 3, 4, 5.</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Count objects, actions and sounds.</li> <li>Count beyond ten.</li> </ul>
ELG	Mathematics	Numerical Patterns	<ul style="list-style-type: none"> <li>Verbally count beyond 20, recognising the pattern of the counting system.</li> </ul>

### Identifying, Representing and Estimating Numbers

Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Show 'finger numbers' up to 5.</li> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Subitise.</li> <li>Link the number symbol (numeral) with its cardinal number value.</li> </ul>
ELG	Mathematics		Number

### Reading and Writing Numbers

Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Link the number symbol (numeral) with its cardinal number value.</li> </ul>

### Compare and Order Numbers

Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Compare quantities using language: 'more than', 'fewer than'.</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Compare numbers.</li> </ul>
ELG	Mathematics	Numerical Patterns	<ul style="list-style-type: none"> <li>Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.</li> </ul>

### Understanding Place Value

Reception	Mathematics		<ul style="list-style-type: none"> <li>Understand the 'one more than/one less than' relationship between consecutive numbers.</li> <li>Explore the composition of numbers to 10.</li> </ul>
ELG	Mathematics	Number	<ul style="list-style-type: none"> <li>Have a deep understanding of numbers to 10, including the composition of each number.</li> </ul>

<b>Solve Problems</b>			
Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Solve real world mathematical problems with numbers up to 5.</li> </ul>
<b>Addition and Subtraction</b>			
<b>Mental Calculations</b>			
Reception	Mathematics		<ul style="list-style-type: none"> <li>Automatically recall number bonds for numbers 0-10.</li> </ul>
ELG	Mathematics	Number	<ul style="list-style-type: none"> <li>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</li> </ul>
<b>Solve Problems</b>			
ELG	Mathematics	Numerical Patterns	<ul style="list-style-type: none"> <li>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Subitise.</li> <li>Link the number symbol (numeral) with its cardinal number value.</li> </ul>
<b>Measurement</b>			
<b>Describe, Measure, Compare and Solve (All Strands)</b>			
Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Make comparisons between objects relating to size, length, weight and capacity.</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Compare length, weight and capacity.</li> </ul>
<b>Telling the Time</b>			
Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then...'</li> </ul>
<b>Properties of Shapes</b>			
<b>Recognise 2D and 3D Shapes and their Properties</b>			
Three and Four-Year-Olds	Mathematics		<ul style="list-style-type: none"> <li>Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'flat', 'round'.</li> <li>Select shapes appropriately: flat surfaces for a building, a triangular pattern for a roof, etc.</li> <li>Combine shapes to make new ones - an arch, a bigger triangle, etc.</li> </ul>
Reception	Mathematics		<ul style="list-style-type: none"> <li>Select, rotate and manipulate shapes in order to develop spatial reasoning skills.</li> </ul>
<b>Compare and Classify Shapes</b>			
Reception	Mathematics		<ul style="list-style-type: none"> <li>Compose and decompose shapes so that children can recognise a shape can have other shapes within it, just as numbers can.</li> </ul>
<b>Position and Direction</b>			
<b>Position, Direction and Movement</b>			

Three and Four-Year-Olds	Mathematics	<ul style="list-style-type: none"> <li>Understand position through words alone - for example, "The bag is under the table," - with no pointing.</li> <li>Describe a familiar route.</li> <li>Discuss routes and locations, using words like 'in front of' and 'behind'.</li> </ul>
Reception	Understanding the World	<ul style="list-style-type: none"> <li>Draw information from a simple map.</li> </ul>
<b>Patterns</b>		
Three and Four-Year-Olds	Mathematics	<ul style="list-style-type: none"> <li>Talk about and identify the patterns around them. For example, stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.</li> <li>Extend and create ABAB patterns - stick, leaf, stick, leaf.</li> <li>Notice and correct an error in a repeating pattern.</li> </ul>
Reception	Mathematics	<ul style="list-style-type: none"> <li>Continue, copy and create repeating patterns.</li> </ul>
<b>Statistics</b>		
<b>Record, Present and Interpret Data</b>		
Three and Four-Year-Olds	Mathematics	<ul style="list-style-type: none"> <li>Experiment with their own symbols and marks, as well as numerals.</li> </ul>

## Year 1

During Year 1, we build on work from the Early Years Foundation Stage, developing pupils' confidence and fluency with whole numbers, counting and place value. This involves working with numerals, words and the four operations. At this stage, children primarily use concrete resources and measuring tools to aid their learning.

At this stage, pupils begin to develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching also involves using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

Additionally, pupils begin to read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

***Year 1 pupils at Gnosall St. Lawrence CE Primary Academy are taught to:***

### **Number: Place Value**

- Count to 10, forwards and backwards, beginning with 0 or 1, or from any given number
- Count, read and write numbers to 10 in numerals and words
- Count to 20, forwards and backwards, beginning with 0 or 1, from any given number.
- Count, read and write numbers to 20 in numerals and words
- Count to 50 forwards and backwards, beginning with 0 or 1, or from any number.
- Count, read and write numbers to 50 in numerals
- Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.
- Count, read and write numbers to 100 in numerals
- Given a number, identify one more or one less
- 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
- Count in multiples of twos, fives and tens

### **Number: Addition and Subtraction**

- Represent and use number bonds and related subtraction facts within 10
- Represent and use number bonds and related subtraction facts within 20
- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs

- Add and subtract one digit numbers to 10, including zero
- Add and subtract one-digit and two-digit numbers to 20, including zero
- Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems

### **Number: Multiplication and Division**

- Count in multiples of twos, fives and tens
- 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

### **Number: 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
- Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)
- Compare, describe and solve practical problems for: mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]

### **Geometry: Shape/Position and Direction**

- Recognise and name common 2-D shapes, including: (for example, rectangles, squares, circles and triangles)
- Recognise and name common 3-D shapes, including: (for example, cuboids, cubes, pyramids and spheres)
- Describe position, direction and movement, including whole, half, quarter and three quarter turns

### **Measurement: Length, Height, Mass, Capacity and Temperature**

- Measure and begin to record lengths and heights
- Compare, describe and solve practical problems for lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)
- Measure and begin to record mass/weight, capacity and volume
- Compare, describe and solve practical problems for mass/weight (for example, heavy/light, heavier than, lighter than); capacity and volume (for example, full/empty, more than, less than, half, half full, quarter)

### **Measurement: Money**

- Recognise and know the value of different denominations of coins and notes

### **Measurement: Time**

- Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening)
- Recognise and use language relating to dates, including days of the week, weeks, months and years.
- Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
- Compare, describe and solve practical problems for time (for example, quicker, slower, earlier, later).
- Measure and begin to record time (hours, minutes, seconds)

## **Year 2**

During Year 2, we build on work from the Early Years Foundation Stage and Year 1, developing pupils' confidence and fluency with whole numbers, counting and place value (up to at least 100). This involves working with numerals, words and the four operations. Children begin to increase their understanding of multiplication and division by working with a range of contexts in which they consider grouping/sharing discrete and continuous quantities, arrays and repeated addition. At this stage, children continue to use concrete resources and measuring tools to aid their learning.

By the end of Year 2, we anticipate being secure in using and understanding place value. This provides a platform to be built upon in Key Stage 2.

At this stage, pupils continue to develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching also involves using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

Additionally, pupils continue to read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

*Year 2 pupils at Gnosall St. Lawrence CE Primary Academy are taught to:*

**Number: Place Value**

- Read and write numbers to at least 100 in numerals and in words
- Recognise the place value of each digit in a two digit number (tens and ones)
- Identify, represent and estimate numbers using different representations including the number line
- Compare and order numbers from 0 up to 100; use  $<$ ,  $>$  and  $=$  signs
- Use place value and number facts to solve problems
- Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward

**Number: Addition and Subtraction**

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- 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 one-digit numbers
- Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

**Number: Multiplication and Division**

- Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals ( $=$ ) sign
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts
- Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

**Number: Fractions**

- 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
- Write simple fractions. For example,  $\frac{1}{2}$  of 6 = 3
- Recognise the equivalence of  $\frac{2}{4}$  and  $\frac{1}{2}$

**Geometry: Shape/Position and Direction**

- 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)

- Compare and sort common 2-D and 3-D shapes and everyday objects
- 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)
- Order and arrange combinations of mathematical objects in patterns and sequences

#### **Measurement: Length, Height, Mass, Capacity and Temperature**

- Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ( $^{\circ}\text{C}$ ); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- Compare and order lengths, mass, volume/capacity and record the results using  $>$ ,  $<$  and  $=$

#### **Measurement: Money**

- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Find different combinations of coins that equal the same amounts of money.
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

#### **Measurement: Time**

- Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- Know the number of minutes in an hour and the number of hours in a day
- Compare and sequence intervals of time

#### **Statistics**

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- 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

### **Year 3**

During Year 3, we build on work from Key Stage 1, ensuring that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value (up to at least 1000). This enables pupils to develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching ensures that pupils begin to draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It also ensures that they can begin to use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 3, pupils will have built on the multiplication table knowledge acquired in Key Stage 1 and be able to recall multiplication and associated division facts for the 3, 4 and 8 multiplication tables.

Additionally, pupils read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

***Year 3 pupils at Gnosall St. Lawrence CE Primary Academy are taught to:***

#### **Number: Place Value**

- Recognise the place value of each digit in a three-digit number (hundreds, tens and ones)
- Compare and order numbers up to 1000
- Read and write numbers up to 1000 in numerals and in words
- Identify, represent and estimate numbers using different representations
- Find 10 or 100 more or less than a given number
- Solve number problems and practical problems involving these ideas

### **Number: Addition and Subtraction**

- 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 with up to three digits, using formal written methods of columnar addition and subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

### **Number: Multiplication and Division**

- Count from 0 in multiples of 4, 8, 50 and 100
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Write and calculate mathematical statements for multiplication and division using the multiplication tables 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  $m$  objectives

### **Number: Fractions**

- 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 and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- Recognise and show, using diagrams, equivalent fractions with small denominators
- Compare and order unit fractions, and fractions with the same denominators
- Add and subtract fractions with the same denominator within one whole (for example,  $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ )
- Solve problems that involve all of the above

### **Geometry: Shape/Position and Direction**

- 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
- Draw 2-D shapes and make 3-D shapes using modelling materials
- Recognise 3-D shapes in different orientations and describe them

### **Measurement: Length, Height, Mass, Capacity and Temperature**

- Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- Measure the perimeter of simple 2D shapes

### **Measurement: Money**

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

### **Measurement: 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 (for example to calculate the time taken by particular events or tasks)

### **Statistics**

- Interpret and present data using bar charts, pictograms and tables
- Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables

## **Year 4**

During Year 4, we build on work from Key Stage 1 and Year 3, ensuring that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value (beyond 1000). This enables pupils to develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching ensures that pupils continue to draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It also ensures that they can continue to use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils will be competent in their recall of all multiplication tables and associated division facts (up to 12x12) and be well-equipped to undertake the statutory Multiplication Check.

Additionally, pupils read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

### ***Year 4 pupils at Gnosall St. Lawrence CE Primary Academy are taught to:***

#### **Number: Place Value**

- Count in multiples of 6, 7, 9, 25 and 1000.
- Find 1000 more or less than a given number.
- Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones)
- Order and compare numbers beyond 1000
- Round any number to the nearest 10, 100 or 1000
- Solve number and practical problems that involve all of the above and with increasingly large positive numbers.
- Count backwards through zero to include negative numbers.
- 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.

#### **Number: Addition and Subtraction**

- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.
- Estimate and use inverse operations to check answers to a calculation.
- Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.

#### **Number: Multiplication and Division**

- Recall and use multiplication and division facts for multiplication tables up to  $12 \times 12$ .
- Count in multiples of 6, 7, 9, 25 and 1000
- 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.
- 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.
- Recognise and use factor pairs and commutativity in mental calculations.
- Multiply two digit and three digit numbers by a one digit number using formal written layout.

### **Number: Fractions**

- Recognise and show, using diagrams, families of common equivalent fractions.
- Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- 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.
- Add and subtract fractions with the same denominator.

### **Number: Decimals**

- Recognise and write decimal equivalents of any number of tenths or hundredths.
- Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths
- Solve simple measure and money problems involving fractions and decimals to two decimal places.
- Convert between different units of measure [for example, kilometre to metre] Compare numbers with the same number of decimal places up to two decimal places.
- Round decimals with one decimal place to the nearest whole number.
- Recognise and write decimal equivalents to 14, 12 and 34

### **Geometry: Shape/Position and Direction**

- Identify acute and obtuse angles and compare and order angles up to two right angles by size.
- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
- Identify lines of symmetry in 2-D shapes presented in different orientations.
- Complete a simple symmetric figure with respect to a specific line of symmetry.
- Describe positions on a 2-D grid as coordinates in the first quadrant.
- Plot specified points and draw sides to complete a given polygon.
- Describe movements between positions as translations of a given unit to the left/ right and up/ down.

### **Measurement: Length and Perimeter**

- Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
- Convert between different units of measure [for example, kilometre to metre]

### **Measurement: Area**

- Find the area of rectilinear shapes by counting squares.

### **Measurement: Money**

- Estimate, compare and calculate different measures, including money in pounds and pence.
- Solve simple measure and money problems involving fractions and decimals to two decimal places.

### **Measurement: Time**

- Convert between different units of measure [for example, kilometre to metre; hour to minute]
- 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.

### **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.

During Year 5, we begin to extend pupils' understanding of the number system and place value to include larger integers (to at least 1,000,000). Subsequently, this develops the connections that children make between multiplication and division with fractions, decimals and percentages.

At this stage, pupils begin to develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.

Teaching in geometry and measures begins to consolidate and extend knowledge developed in number. Teaching also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

During Year 5, pupils build on prior learning by applying all the multiplication tables and related division facts frequently, committing them to memory and using them confidently to solve larger calculations with formal written methods.

By Upper Key Stage 2, pupils read, spell and pronounce mathematical vocabulary correctly.

***Year 5 pupils at Gnosall St. Lawrence CE Primary Academy are taught to:***

**Number: Place Value**

- Read, write, order and compare numbers to at least 1000000 and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1000000.
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.
- Round any number up to 1000000 to the required degree of accuracy
- Solve number problems and practical problems that involve all of the above.
- Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

**Number: Addition and Subtraction**

- Add and subtract numbers mentally with increasingly large numbers.
- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

**Number: Multiplication and Division**

- Multiply and divide numbers mentally drawing upon known facts.
- Multiply and divide whole numbers and decimals by 10, 100 and 1000.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3)
- 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.
- Establish whether a number up to 100 is prime and recall prime numbers up to 19
- Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for 2 digit numbers.
- Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context.

**Number: Fractions**

- Compare and order fractions whose denominators are multiples of the same number.
- Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.

- Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements  $>1$  as a mixed number
- Add and subtract fractions with the same denominator and denominators that are multiples of the same number.
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- Read and write decimal numbers as fractions

### **Number: Decimals and Percentages**

- Read, write, order and compare numbers with up to three decimal places.
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
- Round decimals with two decimal places to the nearest whole number and to one decimal place.
- Solve problems involving number up to three decimal places.
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.
- Solve problems which require knowing percentage and decimal equivalents of  $\frac{1}{2}$   $\frac{1}{4}$   $\frac{1}{5}$  and those fractions with a denominator of a multiple of 10 or 25.

### **Geometry: Shapes and Angles/Position and Direction**

- Identify 3D shapes, including cubes and other cuboids, from 2D representations.
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- Draw, estimate and compare acute, obtuse and reflex angles, knowing they are measured in degrees..
- Identify: angles at a point and one whole turn (total 360o), angles at a point on a straight line and  $\frac{1}{2}$  a turn (total 180o) other multiples of 90o
- 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.

### **Measurement: Perimeter and Area**

- Measure and calculate the perimeter of composite rectilinear shapes in cm and m.
- Calculate and compare the area of rectangles (including squares), and including using standard units, cm<sup>2</sup>, m<sup>2</sup> estimate the area of irregular shapes.

### **Measurement: Converting Units**

- Convert between different units of metric measure [for example, km and m; cm and m; cm and mm; g and kg; l and ml]
- Solve problems involving converting between units of time.

### **Measures: Volume**

- Estimate volume [for example using 1cm<sup>3</sup> blocks to build cuboids (including cubes)] and capacity [for example, using water]
- Use all four operations to solve problems involving measure.

### **Statistics**

- Solve comparison, sum and difference problems using information presented in a line graph.
- Complete, read and interpret information in tables including timetables.

## **Year 6**

During Year 6, we continue to extend pupils' understanding of the number system and place value to include larger integers (up to 10,000,000). Subsequently, this enhances the connections that children make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils consolidate their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems.

Teaching in geometry and measures further consolidates and extends knowledge developed in number. Teaching also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

During Year 6, pupils continue to maintain their fluency by applying all the multiplication tables and related division facts frequently, committing them to memory and using them confidently to solve larger calculations with formal written methods (including long division).

By Upper Key Stage 2, pupils read, spell and pronounce mathematical vocabulary correctly.

***Year 6 pupils at Gnosall St. Lawrence CE Primary Academy are taught to:***

**Number: Place Value**

- Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.
- Round any whole number to a required degree of accuracy.
- Use negative numbers in context, and calculate intervals across zero.
- Solve number and practical problems that involve all of the above.

**Number: Addition, Subtraction, Multiplication and Division**

- Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.
- Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication.
- Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.
- Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context.
- Identify common factors, common multiples and prime numbers.
- Use their knowledge of the order of operations to carry out calculations involving the four operations.
- Solve problems involving addition, subtraction, multiplication and division.
- Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy

**Number: Fractions**

- 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 denominations and mixed numbers, using the concept of equivalent fractions.
- Multiply simple pairs of proper fractions, writing the answer in its simplest form
- Divide proper fractions by whole numbers
- Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction
- Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

**Number: Decimals**

- Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places.
- Multiply one-digit numbers with up to 2 decimal places by whole numbers.
- Use written division methods in cases where the answer has up to 2 decimal places.
- Solve problems which require answers to be rounded to specified degrees of accuracy.

**Number: Percentages**

- Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison.

### **Number: 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.

### **Number: 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 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.

### **Geometry: Properties of Shapes/Position and Direction**

- Draw 2-D shapes using given dimensions and angles.
- Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.
- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
- 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.

### **Measurement: 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 3dp.
- Convert between miles and kilometres.

### **Measurement: Perimeter, Area and Volume**

- Recognise that shapes with the same areas can have different perimeters and vice versa.
- Recognise when it is possible to use formulae for area and volume of shapes.
- Calculate the area of parallelograms and triangles.
- Calculate, estimate and compare volume of cubes and cuboids using standard units, including  $\text{cm}^3$ ,  $\text{m}^3$  and extending to other units ( $\text{mm}^3$ ,  $\text{km}^3$ )

### **Statistics**

- Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.
- Interpret and construct pie charts and line graphs and use these to solve problems.
- Calculate the mean as an average.

Impact

#### **Pupil Voice**

Through discussion and feedback, children talk enthusiastically about maths lessons. They can discuss the context in which maths is being taught, relating this to real-life scenarios and they can ask relevant questions about their learning.

#### **Evidence in Knowledge**

Pupils recognise the significance of maths in the workplace and its value in the wider world. They recognise how maths can be used in order to support their potential.

**Evidence in Skills**

Pupils can independently use the vocabulary and methods taught in fluency, problem solving and reasoning contexts. They recognise the importance of a “growth mindset” and resilience when answering more complex problems.

**Breadth and Depth**

Teachers plan a range of opportunities for children to enhance their mathematical skills independently, with a partner, in groups and in a variety contexts. Additionally, they seek parental involvement and encourage home-learning opportunities.