Step by Step Learning	Maths	National Curriculum

When all components are taught, practised, processed and transferred to long term memory, our children will be able to:

Early Year

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically.

Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Key Stage 1

Children will develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations including, concrete, pictorial and abstract representations.

Children will develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.

Children will use a range of measures to describe and compare different quantities such as length, mass, capacity/ volume, time and money.

By the end of Year 2 pupils should know their number bonds to 20 and be precise in using and understanding place value.

Lower Key Stage 2

Children will become increasingly fluent with whole numbers and the four operations including number facts and the concept of place value. They should develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

Children should develop their ability to solve a range of problems, including with simple fractions and decimal place. Children should draw with increasing accuracy and develop mathematical reasoning as they can analyse shapes and their properties and confidently describe the relationship between them. Children should use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4 children should have memorised their multiplication tables upyo and including the 12 x table and show fluency I their work.

Mastery Maths

Everyone can learn and enjoy Maths and this is achieved by teaching for Mastery. Children of all ages will acquire a deep, long term, secure and adaptable understanding of Maths.

Step by Step Learning	Maths	Place Value

When all components are taught, practised, processed and transferred to long term memory, our children will be able to:

Count, Represent, Use and Compare, Problems/Rounding

Year Four

- Count in multiples of 6,7,9,25,and 1000.
- Count backwards and forwards through zero to include negative numbers.
- Identify, represent and estimate numbers using different representations
- Read Roman numerals to 100. and know that over time the numeral system changed to include the concept of zero and place value,
- 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 practical problems that involve the above and with increasingly larger positive numbers.

Year Three

- Count from 0 in multiples of 4, 8, 50 and 100.
- Find 10 or 100 more or less than a given number.
- Identify, represent and estimate numbers using different representations
- Read and write numbers up to 1000 in numerals and words.
- Recognise the place value of each digit in a three– digit number (hundreds, tens and ones) .
- Compare and order numbers up to 1000
- Solve number problems and practical problems involving these ideas.

Year Two

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

Year One

- Count to and across 100, forwards and backwards beginning with 0 or 1 from any given number. Count numbers to 100 in numerals.
- Count in multiples of twos, fives and tens.
- Identify and represent numbers using objects and pictorial representation.
- Read and write numbers to 100 in numerals.
- Read and write numbers from 1 to 20 in numerals and words.
- Given a number identify one more and one less.

Step by Step Learning	Maths	Numerical Patterns

Counting, comparing, representing

EYFS

- Recognise some numerals of personal significance

- Recognise numerals 1 to 5.

- Count up to three or four objects by saying one number name for erach item.

- Counts actions or objects that cannot be removed.

- Counts objects to 10 and beginning to count beyond 10.

- Counts out up to six objects from a larger group.

- Selects the correct numerals to represent 1 to 5, then 1 to 10 objects.

- Counts an irregular arrangement of up to ten objects.

- Estimates how many objects they can see and checks by counting them.

- Uses the language of 'more' and 'fewer' to compare two sets of objects.

- Says the number that is one more than a given number.

- Finds one more or one less from a group of up to five objects, then ten objects.

- **ELG: Children can count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.**

Step by Step Learning	Maths	Addition and Subtraction

Calculations , problems

Year 4

- Add and subtract numbers with up to 4 digits using the formal written methods of column addition and subtraction where appropriate
- Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why

Year Three

- Add and subtract numbers mentally, including:
- A 3 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 column addition and subtraction
- Solve problems including missing number problems using number facts, place value and more complex addition and subtraction.

Year Two

- 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
- 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.

Year One

- 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 such as $7 = \square - 9$

EYFS

- Finds the total number of items in two groups by counting all of them.
- In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.
- Records using marks that they can interpret and explain.

ELG: Using quantities of objects, add and subtract two single-digit numbers and count on or back to find the answer.

Step by Step Learning	Maths	Multiplication and Division

Recall/use, calculations problems solve problems

Year Four

- Recall multiplication and Division facts for multiplication and division facts for multiplication tables up to 12 x 12
- Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1, multiplying together three numbers
- Recognise and use factor pairs and commutativity in mental calculations.
- Multiply two-digit and three-digit numbers by a one-digit using formal written layout.
- Solve problems involving multiplication 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.
- Solve problems involving increasingly harder fraction to calculate quantities and fractions to divide quantities including non-unit fractions where the answer is a whole number.

Year Three

- 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 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 such as n objects are connected to m objects.
- Solve problems that involve all of the above.

Year Two

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

Year One

- 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.

EYFS

- Begins to identify own mathematical problems based on own interests '

- ELG: Solve problems including doubling, halving and sharing.

Step by Step Learning	Maths	Fractions

Recognise and write ,compare calculations

Year Four

- Count up and down in hundredths, recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten
- Recognise and show, using diagrams, families of common equivalent fractions

Year Three

- 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.
- 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
- Compare and order unit fractions and fractions with the same denominator
- Add and subtract fractions with the same denominator within one whole (eg. 5/7 + 1/7 = 6/7)

Year Two

- Recognise, find, name and write fractions ¼, ¾, 2/4 , 1/3 of a length, shape, set of objects or quantity.
- Recognise the equivalence of 2/4 and 1/2
- Write simple fractions eg. ½ of 6 =3

Year One

- 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.

EYFS

- ELG: Solve problems including doubling, halving and sharing.

Step by Step Learning	Maths	Decimals

When all components are taught, practised, processed and transferred to long term memory, our children will be able to:

Write and compare

Year Four

- Recognise and write decimal equivalent of any number of tenths or hundredths
- Recognise and write decimal equivalents to ¼, ½, ¾
- Round decimals with one decimal place to the nearest whole number
- Compare numbers with the same number of decimal places up to two decimal places
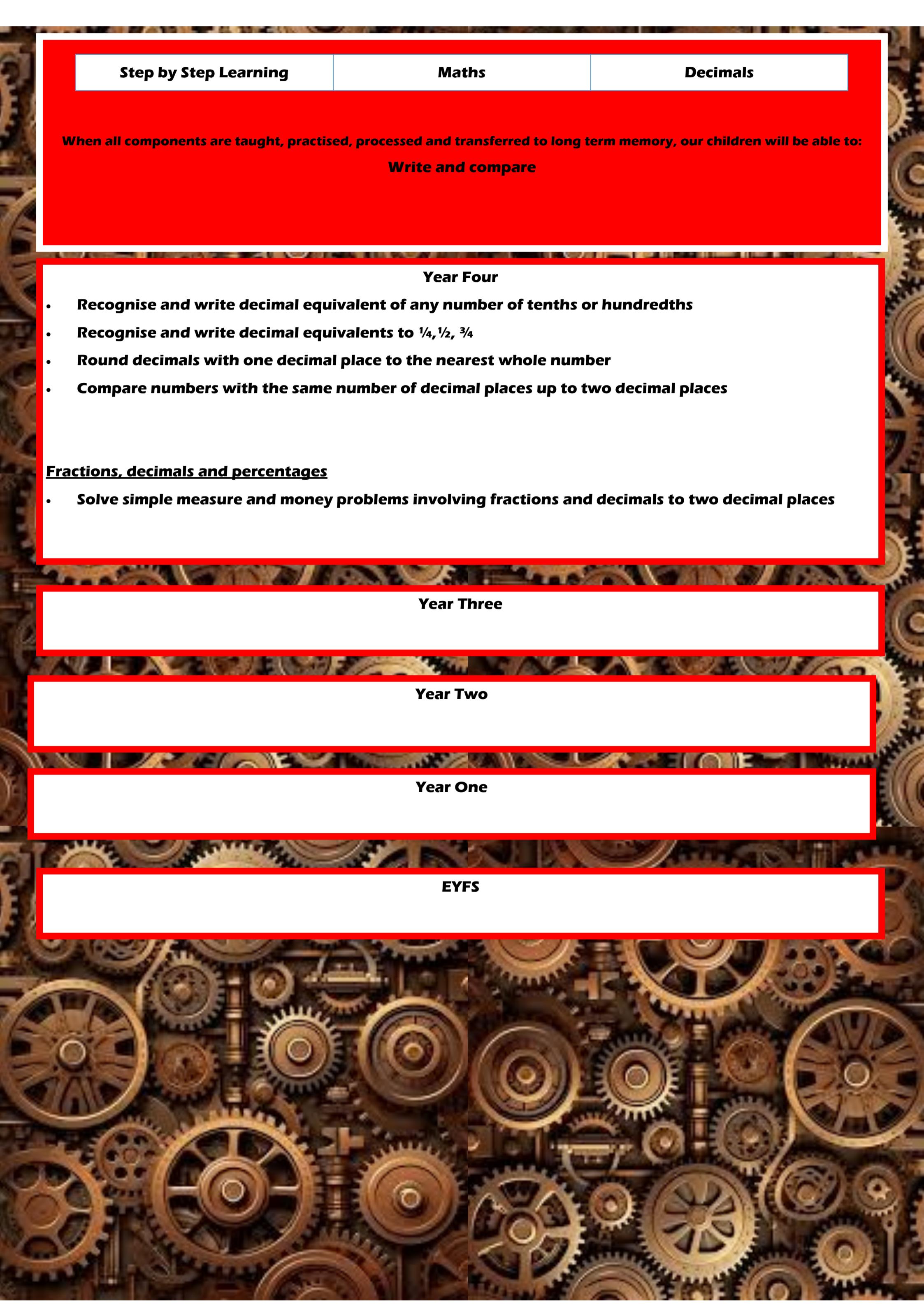
<u>Fractions, decimals and percentages</u>

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

Year Three

Year Two

Year One

EYFS

Step by Step Learning	Maths	Algebra

When all components are taught, practised, processed and transferred to long term memory, our children will be able to:

Year Four

Year Three

- Solve problems including missing number problems.

Year Two

- Recognise and use the inverse relationship between addition and subtraction and use this to check calculation and solve missing numbers.

Year One

- Solve one step problems that involve addition and subtraction using concrete objects and pictorial representations and missing number problems such as 7= ☐ -9

EYFS

Although fornmal algebraic notations are not introduced until Year 6, algebraic thinking starts much earlier as exemplified by the missing number objectives from Y1,2and 3

Step by Step Learning	Maths	Measurement

Using measures Money, Time, perimeter, area and volume

Year Four

- Convert between different units of measurement (eg. Kilometre to metre, hour to minute)
- Estimate, compare and calculate different measures
- Estimate, compare and calculate measures including money in pounds and pence
- Read, write and convert time between analogue and digital 12– and 24– hour clocks
- Solve problems including converting from hours to minutes, minutes to seconds, years to months, weeks to days.
- Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.
- Find the area of rectilinear shapes by counting squares.

Year Three

- Measure, compare, add and subtract lengths (m, cm, mm), mass (kg,g), volume and capacity (l,ml)
- Add and subtract amounts of money to give change, using both £ and p in practical contexts
- Tell and write the time from an analogue clock including roman numerals from I to X111 and 12– hour and 24-hour clocks.
- Estimate and read time increasing accuracy to the nearest minute, record and compare time in terms of seconds, minutes and hours. Use vocabulary such as o'clock, am, pm, 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 eg. Calculate the time taken by particular events or tasks.
- Measure the perimeter of simple 2D shapes.

Year Two

- Choose and use appropriate standard units to estimate and measure length/height in any direction (m,cm), mass (kg/g) temperature (degrees centigrade),capacity (l.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 =
- 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 amount of money
- Solve problems in a practical context involving addition and subtraction of money of the same unit including giving change
- Compare and sequence intervals of time
- Tell and write the time to 5 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.

Step by Step Learning	Maths	Measurement

Using measures Money, Time

Year One

- Compare, describe and solve practical problems for :
- Lengths and heights
- Mass/weight
- Capacity and volume
- Time
- Measure and begin to record the following:
- Lengths and heights
- Mass/weight
- Capacity and volume
- Time (hours, minutes and seconds)
- Recognise and know the value of different denominations of coins and notes.
- Sequence events in chronological order using language eg. Before/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 hands on a clock face to show these times.

EYFS

- Order two or three items by length or height.
- Order two items by weight or capacity.
- Use familiar objects and common shapes to create and recreate patterns and build models
- Use everyday language related to time.
- Orders and sequences familiar events.
- Measures short periods of time in simple ways.
- Beginning to use everyday language related to money.
- ELG: Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.
- Recognise, create and describe patterns.

Step by Step Learning	Maths	Geometry

2D shapes 3D shapes, Angles and lines, position and direction

Year Four

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

Year Three

- **Draw 2D shapes**
- Make 3D shapes using modelling materials, recognise 3D 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 half a turn, three make three quarter 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.

Year Two

- Identify and describe the properties of 2D shapes including te number of sides and lines of symmetry in a vertical line.
- Identify 2D shapes on the surface of 3D shapes eg. A circle on a cylinder and a triangle on a pyramid.
- Compare and sort common 2D shapes and everyday objects.
- Recognise and name common 3D shapes-eg. Cuboid, including cubes, pyramids and spheres
- Compare and sort common 3D shapes and everyday objects.
- Order and arrange combinations of mathematical objects in patterns and sequences.
- 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.

Step by Step Learning	Maths	Geometry

2D shapes 3D shapes

Year One

- Recognise and name 2D shapes eg. Rectangles, including squares, circles and triangles.
- Recognise and name common 3D shapes-eg. Cuboid, including cubes, pyramids and spheres
- Describe position, direction and movement including whole, half, quarter and three quarter turns

EYFS

- Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes and mathematical terms to describe shapes.
- Selects a particular named shape.
- Describe their relative position such as 'behind' or 'next to'

Step by Step Learning	Maths	Statistics

Present and interpret data, solve statistical problems

Year Four
- 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.

Year Three
- Interpret and present data using bar charts, pictograms and tables
- Solve one—step and two— step questions eg. How many more?, and How many fewer? Using information presented in scaled bar charts and pictograms and tables.

Year Two
- 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 simple questions about totalling and comparing categorical data

Year One

EYFS