Mathematics at Holy Trinity CE Primary

"It's not that I'm so smart, I just stay with problems longer." *Albert Einstein*

Our curriculum **intent for mathematics** is that every child will:

- Develop a sense of enjoyment and curiosity about mathematics
- Become fluent in the basics of mathematics
- Develop the ability to recall and apply knowledge quickly and accurately
- Reason mathematically using mathematical language
- Apply their mathematics to solve problems

At Holy Trinity, we aim not only develop the mathematical skills and understanding required for later life, but also an enthusiasm, enjoyment and fascination about mathematics itself. We have high expectations that every child will enjoy and be successful in mathematics. We aim to increase confidence in mathematics so pupils are able to express themselves and their ideas using mathematical language. We recognise the importance of creating a supportive environment where children are given the opportunities to respond to high levels of expectation and challenge as well as developing their independence.

Implementation of the mathematics Curriculum at Holy Trinity
We use the White Rose scheme of work.
We recognise the importance of developing a balance of:

- Number fluency
- Reasoning
- Problem solving

We continually aim to embed these three main areas into every lesson and give pupils opportunities to make links between mathematical ideas. Pupils regularly practise fluency skills in a range of different ways.

EYFS Pupils use:

- Rhymes, songs and chanting
- Games
- Create and represent number patterns using mathematical equipment, models and images and natural resources from forest school
- Mathletics and hit the button

KS1 pupils use:

- Rhymes, songs and chanting
- Games
- Create and represent number patterns using mathematical equipment, models and images and natural resources from forest school
- Mathletics and hit the button
- Times tables rock stars
- Step maths
- Arithmetic practice

KS2 pupils use:

- Songs, raps and chanting
- Games
- Create and represent number patterns using mathematical equipment, models and images and natural resources from forest school
- Mathletics and hit the button
- Times tables rock stars
- Step maths
- Weekly arithmetic practice

Pupils' achievements in mathematics are recognised through certificates and badges in assembly.

At Holy Trinity, we believe that no ceiling should ever be put on a pupil's learning potential, therefore we differentiate lessons using our whole school approach 'Going for Gold'. Pupils are encouraged to choose their own level which encourages independence and resilience.

We aim to develop meaningful and creative links across other curriculum subjects and for pupils to be able to apply and practice their mathematical skills in a range of different ways.

For homework, pupils use Mathletics and Times Tables Rock Stars.

Pupils regularly take part in Math's competitions, building their confidence and raising the status of mathematics within the school.

The **Impact** of the Mathematics Curriculum at Holy Trinity

- Enthusiasm and enjoyment of the mathematics curriculum promotes confidence and achievement
- Pupils will be resilient and will have the skills to learn from their mistakes
- Pupils will leave Holy Trinity confident in their maths skills and the ability to apply this to reason and solve problems
- Pupils will be fluent in all basic skills
- Challenge, interventions and time taken ensures a higher level of pupils attaining greater depth

How does Mathematics fit into our School Vision?

Mathematics links/actions:
• Reward pupils in assemblies for achievements in mathematics • Going for gold approach encourages independence and self- confidence • Offer calculation workshops to all parents • Provide parents with calculation videos and links to resources
• Provide CPD for staff in mathematics • Provide and point staff towards high quality resources • Explore further teaching resources to reduce workload
• Ensure pupils have access to high quality resources • Ensure resources are suitable for age/ needs of pupils • Be aware of new mathematical resources that would engage and inspire pupils • Research apps to install to support learning •
• Continue link with local cluster for moderating/ training etc • Continue to enter Math's competitions (Maidenhead Rotary Club and The Marist etc) • Continue link with Ascot Race- course for mathematics days • Link with Charters to enquire about resources/ specialised teaching • Forge links with other mathematics subject leaders across the local cluster

Holy Trinity CE Primary Mathematics overview

	Autumn	Spring	Summer
EYFS	**Number and Place Value** **Numbers to 5** • Subitising • Comparing groups within 5 • Comparing quantities of identical objects/ non-identical objects **Addition and Subtraction** • Change within 5 • One more/one less **Number and Place Value** • Numbers 4,5,6,7,8 • Subitising and early doubling **Time** • First/Then/Now **Spatial Thinking and Shape** • 2D/3D shape • Creating patterns	**Number and Place Value** **Numbers 6,7,8** • Making Pairs • Combining different groups **Numbers 9,10** • Building 9 and 10 • Early Doubling • Subitising **Shape** • 2D/3D **Numbers 7,8,9,10** • Halving • Doubling • Sharing • Subitising	**To 20 and Beyond** • Building numbers beyond 10 • 10-15 • Counting patterns beyond 10 **Patterns** • Making more complex patterns • Find my pattern **Numbers** • 15,16,17,18,19.20 • Halving, doubling, sharing • Subitising **Measure** • Length • Weight • Capacity

Year 1

Number- Place Value (Within 10)

- **I can count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number**
- **I can count, read and write numbers to 100 in numerals**
- **I can count in multiples of twos, fives and tens**
- **I can identify one more and one less**
- I can identify and represent numbers using objects and pictorial representations
- I can read and write numbers from 1 to 10 in numerals and words.

Number- Addition and Subtraction (Within 10)

- **I can read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs**
- **I can represent and use number bonds and related subtraction facts within 20**
- I can add and subtract one-digit and two-digit numbers to 20, including zero
- I can solve one-step problems that involve addition and subtraction, using concrete objects

Geometry- Shape

- **I can 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].

Number- Place Value (Within 20)

- I can count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number

Number- Addition and Subtraction (Within 20)

- **I can read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs**
- I can represent and use number bonds and related subtraction facts within 20
- I can add and subtract one-digit and two-digit numbers to 20, including zero
- I can solve one-step problems that involve addition and subtraction, using concrete objects

Number- Place Value (Within 50)

- I can count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- I can count, read and write numbers to 100 in numerals
- I can count in multiples of twos, fives and tens
- I can identify one more and one less
- I can identify and represent numbers using objects and pictorial representations
- I can read and write numbers from 1 to 10 in numerals and words.

Measurement- Length and Height

- **I can compare, describe and solve practical problems for: lengths and heights** [for example, long/short, longer/shorter, tall/short, double/half]
- I can measure and begin to record the following:
  - lengths and heights

Measurement- Weight and Volume

- **I can 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]
- I can measure and begin to record the following:
  - mass/weight

Number- Multiplication and Division

- **I can 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

- **I can recognise, find and name a half as one of two equal parts of an object, shape or quantity**
- **I can recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.**

Geometry- Position and Direction

- **I can describe position, direction and movement, including whole, half, quarter and three-quarter turns.**

Number- Place Value (Within 100)

- I can count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- I can count, read and write numbers to 100 in numerals
- I can count in multiples of twos, fives and tens
- I can identify one more and one less
- I can identify and represent numbers using objects and pictorial representations
- I can read and write numbers from 1 to 10 in numerals and words.

Measurement- Money

- **I can recognise and know the value of different denominations of coins and notes**

Measurement- Time

	• I can count, read and write numbers to 100 in numerals • **I can count in multiples of twos, fives and tens** • I can identify one more and one less • I can identify and represent numbers using objects and pictorial representations • **I can read and write numbers from 1 to 20 in numerals and words.** **Cross Curricular Links/outcomes:**	➢ capacity and volume **Cross Curricular Links/outcomes:**	• I can compare, describe and solve practical problems for: time [for example, quicker, slower, earlier, later] • I can measure and begin to record the following: time (hours, minutes, seconds) • **I can sequence events in chronological order** using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening • **I can recognise and use language relating to dates, including days of the week, weeks, months and years** • **I can tell the time to the hour and half past the hour and draw the hands on a clock face to show these times** **Cross Curricular Links/outcomes:**

Year 2

Number- Place Value

- I can count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- I can recognise the place value of each digit in a two-digit number (tens, ones)
- I can identify, represent and estimate numbers using different representations, including the number line
- I can compare and order numbers from 0 up to 100; use <, > and = signs
- I can read and write numbers to at least 100 in numerals and in words
- I can use place value and number facts to solve problems.

Number- Addition and Subtraction

- I can solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- I can apply my increasing knowledge of mental and written methods
- I can recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- I can 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 addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- I can 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

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

Statistics

- I can interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- I can ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- I can ask and answer questions about totalling and comparing categorical data.

Geometry- Properties of Shape

- I can identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- I can identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- I can identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
- I can compare and sort common 2-D and 3-D shapes and everyday objects

Geometry- Position and Direction

- I can order and arrange combinations of mathematical objects in patterns and sequences
- I can 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 anticlockwise).

Problem Solving

- I can solve problems with addition and subtraction
- I can solve problems including multiplication and division
- I can use place value and number facts to solve problems

Measurement- Time

- I can compare and sequence intervals of time
- I can 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
- I know the number of minutes in an hour and the number of hours in a day.

Measurement- Mass, Capacity and Temperature

- I can choose and use appropriate standard units to estimate and measure mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using scales, thermometers and measuring vessels
- I can compare and order lengths, mass, volume/capacity and record the results using >, < and =

Cross Curricular Links/outcomes:

Measurement- Money

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

Number- Multiplication and Division

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

Cross Curricular Links/outcomes:

Number- Fractions

- I can recognise, find, name and write fractions: 1/3 , ¼ and 2/4 and ¾ of a length, shape, set of objects or quantity
- I can write simple fractions for example,
- ½ of 6 = 3 and recognise the equivalence of 2/4 and ½

Measurement- Length and Height

- I can choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers,
- I can compare and order lengths using >, < and =

Cross Curricular Links/outcomes:

Year 3

Number- Place Value

- I can count from 0 in multiples of 4, 8, 50 and 100
- I can find 10 or 100 more or less than a given number
- I can recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
- I can compare and order numbers up to 1000
- I can identify, represent and estimate numbers using different representations
- I can read and write numbers up to 1000 in numerals and in words
- I can solve number problems and practical problems involving these ideas.

Number- Addition and Subtraction

- I can add and subtract numbers mentally, including:
  - a three-digit number and ones
  - a three-digit number and tens
  - a three-digit number and hundreds
- I can add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- I can estimate the answer to a calculation and use inverse operations to check answers
- I can solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Number- Multiplication and Division

- I can recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- I can write and calculate mathematical statements for multiplication and division using the multiplication tables that I know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Number- Multiplication and Division

- I can recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- I can write and calculate mathematical statements for multiplication and division using the multiplication tables that I know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- I can 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.

Measurement- Money

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

Statistics

- I can interpret and present data using bar charts, pictograms and tables
- I can 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.

Measurement- Length and Perimeter

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

Number- Fractions

Number- Fractions

- I can count up and down in tenths; recognise that tenths arise from dividing an object into10 equal parts and in dividing one-digit numbers or quantities by 10
- I can recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- I can recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- I can recognise and show, using diagrams, equivalent fractions with small denominators
- I can add and subtract fractions with the same denominator within one whole
- I can compare and order unit fractions, and fractions with the same denominators
- I can solve problems that involve all of the above.

Measurement- Time

- I can tell and write the time from:
  - an analogue clock,
  - including using Roman numerals from I to XII
  - 12-hour and 24-hour clocks
- I can 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
- I know the number of seconds in a minute and the number of days in each month, year and leap year
- I can compare durations of events [for example to calculate the time taken by particular events or tasks].

Geometry- Properties of Shape

	• I can 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 **Cross Curricular Links/outcomes:**	• I can count up and down in tenths; recognise that tenths arise from dividing an object into10 equal parts and in dividing one-digit numbers or quantities by 10 • I can recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • I can recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • I can recognise and show, using diagrams, equivalent fractions with small denominators • I can add and subtract fractions with the same denominator within one whole • I can compare and order unit fractions, and fractions with the same denominators • I can solve problems that involve all of the above. **Cross Curricular Links/outcomes:**	• I can draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • I can recognise angles as a property of shape or a description of a turn • I can 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 • I can identify horizontal and vertical lines and pairs of perpendicular and parallel lines. **<u>Measurement- Mass and Capacity</u>** • I can measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g);volume/capacity (l/ml) **Cross Curricular Links/outcomes:**

Year 4

Number- Place Value

- I can count in multiples of 6, 7, 9, 25 and 1000
- I can find 1000 more or less than a given number
- I can count backwards through zero to include negative numbers
- I can recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
- I can order and compare numbers beyond 1000
- I can identify, represent and estimate numbers using different representations
- I can round any number to the nearest 10, 100 or 1000
- I can solve number and practical problems that involve all of the above and with increasingly large positive numbers
- I can 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

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

Measurement- Length and Perimeter

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

Number- Multiplication and Division

- I can recall multiplication and division facts for multiplication tables up to 12 × 12
- I can 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
- I can recognise and use factor pairs and commutativity in mental calculations
- I can multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- I can 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.

Measurement- Area

- I can find the area of rectilinear shapes by counting squares

Number- Fractions

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

Decimals

- I can recognise and write decimal equivalents of any number of tenths or hundredths

Decimals

- I can recognise and write decimal equivalents of any number of tenths or hundredths
- I can recognise and write decimal equivalents to ¼,1/2 and 3/4
- I can 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
- I can round decimals with one decimal place to the nearest whole number
- I can compare numbers with the same number of decimal places up to two decimal places
- I can solve simple measure and money problems involving fractions and decimals to two decimal places.

Measurement- Money

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

Measurement- Time

- I can read, write and convert time between analogue and digital 12- and 24-hour clocks
- I can solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

Statistics

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

Geometry-Properties of Shape

	Number- Multiplication and Division • I can recall multiplication and division facts for multiplication tables up to 12 × 12 • I can 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 • I can recognise and use factor pairs and commutativity in mental calculations • I can multiply two-digit and three-digit numbers by a one-digit number using formal written layout • I can 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. **Cross Curricular Links/outcomes:**	• I can recognise and write decimal equivalents to ¼,1/2 and 3/4 • I can 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 • I can round decimals with one decimal place to the nearest whole number • I can compare numbers with the same number of decimal places up to two decimal places • I can solve simple measure and money problems involving fractions and decimals to two decimal places. **Cross Curricular Links/outcomes:**	• I can compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • I can identify acute and obtuse angles and compare and order angles up to two right angles by size • I can identify lines of symmetry in 2-D shapes presented in different orientations • I can complete a simple symmetric figure with respect to a specific line of symmetry. **Geometry-Position and Direction** • I can describe positions on a 2-D grid as coordinates in the first quadrant • I can describe movements between positions as translations of a given unit to the left/right and up/down • I can plot specified points and draw sides to complete a given polygon. **Cross Curricular Links/outcomes:**

Year 5

Number- Place Value

- I can read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- I can count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- I can interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- I can round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- I can solve number problems and practical problems that involve all of the above
- I can read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Number- Addition and Subtraction

- I can add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- I can add and subtract numbers mentally with increasingly large numbers
- I can use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Statistics

- I can solve comparison, sum and difference problems using information presented in a line graph
- I can complete, read and interpret information in tables, including timetables.

Number- Multiplication and Division

Number- Multiplication and Division

- I can 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
- I can multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- I can recognise and use square numbers and cube numbers, and the notation for squared
- I can solve problems involving multiplication and division including using their knowledge
- of factors and multiples, squares and cubes
- I can solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- I can solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Fractions

- I can compare and order fractions whose denominators are all multiples of the same number
- I can identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- I can recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number
- I can add and subtract fractions with the same denominator and denominators that are multiples of the same number
- I can multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

Decimals and Percentages

Number- Decimals

- I can read and write decimal numbers as fractions
- I can recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- I can round decimals with two decimal places to the nearest whole number and to one decimal place
- I can read, write, order and compare numbers with up to three decimal places
- I can solve problems involving number up to three decimal places
- I can solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25

Geometry- Properties of Shape

- I can identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- I know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- I can draw given angles, and measure them in degrees
- I can identify:
  - angles at a point and one whole turn (total 360°)
  - angles at a point on a straight line and 2
  - 1 a turn (total 180°)
  - other multiples of 90°
- I can use the properties of rectangles to deduce related facts and find missing lengths and angles
- I can distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Geometry- Position and direction

- I can identify, describe and represent the position of a shape following a reflection or translation,

	• I can identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • I know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers • I can establish whether a number up to 100 is prime and recall prime numbers up to 19 • I can multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • I can multiply and divide numbers mentally drawing upon known facts **Cross Curricular Links/outcomes:**	• I can read and write decimal numbers as fractions • I can recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • I can round decimals with two decimal places to the nearest whole number and to one decimal place • I can read, write, order and compare numbers with up to three decimal places • I can solve problems involving number up to three decimal places • I can 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 • I can solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25 **Cross Curricular Links/outcomes:**	using the appropriate language, and know that the shape has not changed. **<u>Measurement- Converting units and volume</u>** • I can convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • I understand and can use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • I can measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • I can calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes • I can estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)and capacity [for example, using water] • I can solve problems involving converting between units of time • I can use all four operations to solve problems involving measure [for example, length, • mass, volume, money] using decimal notation, including scaling. **Cross Curricular Links/outcomes:**

Year 6

Number and Place value

- I can read, write, order and compare numbers up to 10,000,000 and determine the value of each digit
- I can round any whole number to a required degree of accuracy
- I can use negative numbers in context, and calculate intervals across 0
- I can solve number and practical problems that involve all of the above

Number: Addition, Subtraction, Multiplication and Division

- I can multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- I can divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division
- I can divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- I can perform mental calculations, including with mixed operations and large numbers
- I can identify common factors, common multiples and prime numbers
- I can use my knowledge of the order of operations to carry out calculations involving the 4 operations
- I can solve addition and subtraction multi-step problems in context
- I can solve problems involving addition, subtraction, multiplication and division
- I can use estimation to check answers to calculations and determine, in the context of a problem

Geometry - Properties of Shapes

Decimals and Percentages

- I can associate a fraction with division and calculate decimal fraction equivalents
- I can identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places
- I can multiply one-digit numbers with up to 2 decimal places by whole numbers
- I can use written division methods in cases where the answer has up to 2 decimal places
- I can solve problems which require answers to be rounded to specified degrees of accuracy
- I can recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
- I can solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison

Algebra

- I can use simple formulae
- I can generate and describe linear number sequences
- I can express missing number problems algebraically
- I can find pairs of numbers that satisfy an equation with 2 unknowns
- I can enumerate possibilities of combinations of 2 variables

Measurement- Converting Units

- I can solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
- I can use, read, write and convert between standard units, converting measurements of

Geometry- Properties of Shape
(Link to scratch- computing)

- I can draw 2-D shapes using given dimensions and angles
- I can recognise, describe and build simple 3-D shapes, including making nets
- I can compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- I can illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- I can recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

Problem Solving

- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- 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
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Statistics

Link to spreadsheets- computing

- I can interpret and construct pie charts and line graphs and use these to solve problems

	• I can illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • (Link to making code wheels- DT) **Fractions** • I can use common factors to simplify fractions • I can use common multiples to express fractions in the same denomination • I can compare and order fractions, including fractions >1 • I can add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • I can multiply simple pairs of proper fractions, writing the answer in its simplest form • I can divide proper fractions by whole numbers • I can associate a fraction with division and calculate decimal fraction equivalents Week 9/10- Assessments **Geometry - Position and Direction** • I can describe positions on the full coordinate grid (all 4 quadrants) • I can draw and translate simple shapes on the coordinate plane, and reflect them in the axes (Link to Christmas coordinates and cross stitch- DT) **Cross Curricular Links/outcomes:**	length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places • I can convert between miles and kilometres **Measurement- Perimeter, Area and Volume** • I can recognise that shapes with the same areas can have different perimeters and vice versa • I can recognise when it is possible to use formulae for area and volume of shapes • I can calculate the area of parallelograms and triangles • I can calculate, estimate and compare volume of cubes and cuboids using standard units **Ratio and Proportion** Link to scale maps or cooking- DT • I can solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts • I can solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison • I can solve problems involving similar shapes where the scale factor is known or can be found • I can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	• I can calculate and interpret the mean as an average

National Curriculum: Mathematics

Purpose of study

Mathematics is a **creative** and **highly interconnected** discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is **essential to everyday life**, critical to **science**, **technology** and **engineering**, and necessary for **financial literacy** and most forms of employment. A high-quality mathematics education therefore provides a **foundation for understanding the world**, the **ability to reason** mathematically, an appreciation of the **beauty and power of mathematics**, and a sense of enjoyment and curiosity about the subject.

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop **conceptual understanding** and the ability to **recall and apply knowledge rapidly and accurately**
- **reason** mathematically by **following a line of enquiry**, conjecturing relationships and generalisations, and developing an argument, justification or proof using **mathematical language**
- can **solve problems** by **applying** their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Subject Content

Key Stage 1

Pupils should be taught to:

- Use mental fluency with whole numbers, counting and place value.
- Work with numerals, words and the four operations
- Use practical resources [for example, concrete objects and measuring tools].
- Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary
- Use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- Know the number bonds to 20 and be precise in using and understanding place value

Lower Key Stage 2

Pupils should be taught to:

- Develop fluency with whole numbers and the four operations (including number facts and the concept of place value).
- Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Solve a range of problems, including with simple fractions and decimal place value.
- Draw shapes with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- Use measuring instruments with accuracy and make connections between measure and number.
- Memorise their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling

Upper Key Stage 2

Pupils should be taught to:

- Extend their understanding of the number system and place value to include larger integers.
- Make connections between multiplication and division with fractions, decimals, percentages and ratio.
- Solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.
- Learn the language of algebra as a means for solving a variety of problems
- consolidate and extend knowledge developed in number
- classify shapes with increasingly complex geometric properties and learn the vocabulary they need to describe them.
- Be fluent in written methods for all four operations, including long multiplication and division and in working with fractions, decimals and percentages.
- Read, spell and pronounce mathematical vocabulary correctly.