KPIs to embed in all practice:

- ▪ A pupil can justify their choices using mathematical vocabulary and explain or prove how they reached an answer.
- ▪ A pupil can select a suitable strategy or method to check their answer.
- ▪ A pupil can make their own problems where they apply methods which have already been taught.

Greater depth KPIs (depth of learning) will look like:

- Applying mathematical skills in a range of contexts, across a range of subjects, making links with the wider world, being able to reason, justify and explain, proving using different representations and be able to articulate using mathematical language and thinking to others.
- Making generalisations by recognising and explaining patterns found.
- Included below are just some examples for each year group.

Maths KPI's Expected and Greater Depth

Year 1 Expected	Year 1 Greater Depth
- 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 - Count, read and write numbers to 20 in words - Count in multiples of twos, fives and tens - Read, write and interpret mathematical statements involving addition, plus, equals - Represent (including symbols) and use number bonds and related subtraction facts within 20 - Add and subtract one digit and 2 digit numbers to 20, including 0 - Begin using the language of equal to, more than, less than, most and least - Recognise, find and name a half as one of two equal parts of an object, shape or quantity - Begin to recognise. Find and name a quarter of one of four equal parts - Recognise and know the value of different denominations of coins and notes - Describe position, direction and movement including whole, half, quarter and 3 quarter turns Compare, describe and solve practical problems for: - Lengths and heights (long/short, double/half) - Mass/weight (heavy/light) - Capacity and volume (full/empty) - Time (quicker, slower, earlier, later, before, after, next, first, today, yesterday, tomorrow, morning, afternoon, 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 - Recognise and name common 2D and 3D shapes	- Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking - Can reason about addition using the correct mathematical language *A pupil can explain that when you add 0 to a number the number does not change.* *A pupil can explain if 2 numbers added together will total more or less than 10* - Children know and can **prove** that repeated addition is the same as multiplication. *(Eg, using an array or number line)* - Children recognise the pattern that: when counting in 10s from 0 the answer will always end in 0; when counting in 5s from 0, the number will end in 0 or 5; and, when they count in 2s from 0, the answer will always be even - A pupil can work out mental calculations such as: *2 numbers have a sum of 19 and a difference of 5 – what are they?* - A pupil can solve simple missing number box problems such as: *28 - __ = 11, 45 + __ = 57* - A pupil can recognise and explain when a group of objects can be shared equally and when it cannot - Pupils can solve word problems involving more than 1 step - A pupil can find a half of a shape number or quantity and explain that each part must be equal - A pupil can identify which of a selection of o'clock and half past times will occur next - A pupil can arrange 4 containers of different sizes according to mass, or capacity - Pupils can spot 2D shapes in the faces of 3D shapes.

Maths KPI's Expected and Greater Depth

Year 2 Expected	Year 2 Greater Depth
• Can partition two-digit numbers into different combinations of tens and ones. This may include using apparatus (e.g. 23 is the same as 2 tens and 3 ones which is the same as 1 ten and 13 ones) • Recall all number bonds to and within 10 and use these to reasons with and calculate bonds to and within 20. Know that is 7 + 3 = 10, then 17 + 3 = 20 • Can add and subtract 2 two-digit numbers within 100 (e.g. 48 + 35) and can demonstrate and explain their method using concrete apparatus or pictorial representations • Can recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables to solve simple problems, demonstrating an understanding of commutativity as necessary (e.g. knowing they can make 7 groups of 5 from 35 blocks and writing 35 ÷ 5 = 7; sharing 40 cherries between 10 people and writing 40 ÷ 10 = 4; stating the total value of six 5p coins) • Can identify 1/3, 1/4, 1/2, 2/4, 3/4 of a length, shape, set of objects or quantity and knows that all parts must be equal parts of the whole • Can use different coins to make the same amount (e.g. pupil uses coins to make 50p in different ways; pupil can work out how many £2 coins are needed to exchange for a £20 note) • Can read and draw hands on the time on the clock to the nearest 15 minutes • Can describe properties of 2-D and 3-D shapes (e.g. the pupil describes a triangle: it has 3 sides, 3 vertices and 1 line of symmetry; the pupil describes a pyramid: it has 8 edges, 5 faces, 4 of which are triangles and one is a square) • Read scales in divisions of ones, twos, fives and tens	• Can work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Can read scales in divisions of ones, twos, fives and tens in a practical situation where not all numbers on the scale are given and estimate points in between • Can use multiplication facts to make deductions outside known multiplication facts (e.g. a pupil knows that multiples of 5 have one digit of 0 or 5 and uses this to reason that 18 × 5 cannot be 92 as it is not a multiple of 5) • Use reasoning about numbers and relationships to solve more complex problems and explain their thinking. E.g. solve more complex missing number problems (e.g. 14 + − 3 = 17; 14 + Δ = 15 + 27) • Can solve unfamiliar word problems that involve more than one step (e.g. which has the most biscuits, 4 packets of biscuits with 5 in each packet or 3 packets of biscuits with 10 in each packet?) • Can read and draw on hands to show the time on the clock to the nearest 5 minutes • Can describe similarities and differences of shape properties (e.g. finds 2 different 2-D shapes that only have one line of symmetry; that a cube and a cuboid have the same number of edges, faces and vertices but can describe what is different about them)

Maths KPI's Expected and Greater Depth

Year 3 Expected	Year 3 Greater Depth
- Compare and order numbers up to 1000 - Read and write numbers up to 1000 in numerals and words - Count in multiples of 4, 8, 50 and 100 - Find 10 or 100 more or less than a given number - Recognise the place value of each digit in a three digit number (hundreds, tens, ones) - Solve number problems and practical problems involving place value - Add and subtract numbers mentally, including: a 3 digit number and ones, a 3 digit number and tens, a 3 digit number and hundreds - Add and subtract numbers with up to 3 digits using formal written methods of column addition and subtraction – see school calculation policy - Solve problems including missing number problems using number facts, place value and more complex addition and subtraction - Recall and use multiplication and division facts for the 3, 4 and 8 times 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 - 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	- Can work in a systematic, logical way to find patterns, generalise and justify mathematical thinking - Can reason and represent place value in different ways using mathematical language - Pupils can partition a 3-digit number and use that to work out its compliment to 1000, explaining their reasoning using the language of place value - Can calculate mentally using efficient strategies - Pupils can solve missing numbers problems such as 384 = 171 + ? - Can use formal methods to solve problems, including multi-step and apply skills to create own multi-step problems using mathematical language: - Pupils can solve problems such as 'A fish weighs 50g, another fish weighs 8 times as much, how much does the larger fish weigh?' *Pupils can solve problems such as, 'Dad drives a truck. Last week he drove 267 miles on Monday, 186 on Tuesday and 198 on Wednesday. This week Dad drove 282 miles in total. What is the difference in mileage between this week and last week.'* - Can recognise relationships between fractions and decimals and express them as equivalent quantities - Jimmy has 6 marbles. This is 0.4 or 2/5s of the total number. What is the total number of marbles - Can calculate using fractions and decimals - Calculate 2/4 + 3/4 = 5/4 and 5/4 – 3/4 = 2/4. They realise that 5/4 is greater than one and can suggest ways to record this - Can calculate with measures (time, capacity, length, mass) 6 toy cars balance 2 dolls. 4 dolls balance 1 toy robot. If the robot weighs 3 kg, what does each toy car weigh?

Maths KPI's Expected and Greater Depth

• 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 • Measure, compare, add and subtract: lengths (m/cm/mm): mass (kg/g) volume/capacity (l/ml) including measuring the perimeter of simple 2D shapes • 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 using Roman numerals from 1 to X11 and 12 hour and 24 hour clocks • Record and compare time in respect to seconds, minutes and hours • Know the number of days in a month, the number of months in a year and the number of days in a year – including a leap year • 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 • Interpret and present data using bar charts, pictograms and tables, including solving one step and 2 step questions using information presented in scales bar charts and pictograms and tables • Draw 2D shapes using mathematical language • Recognise 2D and 3D shapes in different positions and orientation and describe them	• Can use mathematical reasoning to compare angles • Can you draw a quadrilateral with: 1 right angle? 2 right angles? 5 right *angles? No right angles?* • Can you draw a triangle with 1 right angle? 2 Right angles? • Are some of these are impossible, can you explain why?

Maths KPI's Expected and Greater Depth

Year 4 Expected	Year 4 Greater Depth

Pupils will be able to…
 • Count in multiples of 6, 7, 9, 25 and 1000
    • Count backwards through zero to include negative numbers
    • Order and compare numbers beyond 1000, including up to 2 decimal places
    • Find a 100 more or less than a given number
    • Recognise the place value of each digit in a four digit whole number
    • Round any number to the nearest 10, 100 or 1000
    • Read roman numerals up to 100
    • Add and subtract numbers up to 4 digit using formal written methods – see school calculation policy
    • Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why
    • Recall multiplication and division facts of multiplication tables up to 12 x 12
    • Multiply 2 and 3 digit numbers by 1 digit number using a formal written layout – see school calculation policy
    • Recognise and show, using diagrams (e.g fraction walls), common equivalent fractions, including adding and subtracting fractions
    • Can find fractions of a given quantity
    • Count up and down in hundredths: recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten, including representing as a decimal
    • Round decimals with one decimal place to the nearest whole number
    • Solve simple measure and money problems involving fractions and decimals to two decimal places, including formal column method where appropriate
    • Convert between different units of measure (kilometre to metre: hour to minute)
	• Can work in a systematic, logical way to find patterns, generalise and justify mathematical thinking.
	 • Can reason about place value:
	 • *How many different ways can you write 5510. Pupils suggest ways such as 551 tens, 55 hundreds and 1 ten 5510 ones*
	 • *Arrange the digit cards 1 4 5 and 8 to make the number closest to 6000 and can justify their choice using the language of place value.*
	 • Can calculate mentally using efficient strategies
	 • *Write 3 calculations in which you would use mental calculation strategies and 3 where you would apply a column method and explain the decision you made with each calculation*
	 • *Can work out 345 x 6 mentally by calculating 300 x is 1800 40 x 6 is 240 and 5 x 6 is 30 to get 2070*
	 • Can apply formal methods to solve multi-step problems:
	 • *Sarah buys 5 pens at £1.25 each, 3 pencils at 38p each and a ruler for 85p. How much change does she get from £10?*
	 • Can recognise relationships between fractions and decimals and express them as equivalent quantities
	 • *Can you order these decimals and fractions on a number line? 0.35 3/4 0.5 1/5 4/9*
	 • Can calculate using fractions and decimals:
	 • *A soup recipe uses 3/4 as many onions as carrots. Jo is making the soup and has 8 carrots. How many onions does Jo use? Explain how you worked out the number of onions? Did you use the same method each time?*
	 • Can substitute values into a simple formula to solve problems
	 • *3 x a + 2 = 17 What is the value of a?*
	 • Can calculate with measures (time, capacity, length, mass)
	 • *Converting and ordering across a range of measures*

• Solve problems involving converting time between analogue and digit 12 and 24 hour clocks • Compare and classify geometric shapes, using the language of orientation, including quadrilaterals and triangles, based on their properties and sizes, including Identifying acute, obtuse angles and right angles • Measure and calculate the perimeter and area of rectilinear shapes – including squares in m and cm • Identify lines of symmetry in 2D shapes presented in different orientations • Plot specified points and draw sides to complete a given polygon • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs • Describe and plot positions on 2D grids as co-ordinates, including describing movements as translation	• Can use mathematical reasoning to compare and order angles • *Can compare angles in order to decide whether a polygon is regular*

Year 5 Expected	Year 5 Greater Depth
Pupils will be able to… • Read, write, order and compare numbers to at least 1000000 and determine the value of each digit, including up to 3 decimal places • Round any number up to 1000000 to the nearest 10, 100, 100, 10,000 and 100,000, including rounding to the nearest whole number and one decimal place • Interpret negative numbers in context • Count forwards and backwards with positive and negative whole numbers, including through zero • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) – solve multi-step problems • Add and subtract whole numbers with more than 4 digits mentally • Solve problems involving multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Including prime numbers, composite numbers, squares and cubes • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates (See calculation policy) • Multiple and divide whole numbers and those involving decimals by 10, 100 and 1000 • Compare and order fractions whose denominators are all multiples of the same number • Read and write decimal numbers as fractions • Recognise fractions and decimal equivalents of percent • Read, write, order and compare numbers with up to three decimal places • Solve problems which require knowing percentage and decimal equivalents of a half, quarter, a fifth, two fifths and four fifths and those fractions with a denominator of a multiple of 10 or 25	• Can work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Can reason and represent place value in different ways using mathematical language • *Pupils can work the connection between finding the difference between negative numbers and subtracting them* • Can calculate mentally using efficient strategies • *Pupils can write a variety of calculations derived from 15 + 63 = 78 and generalize to describe further calculations 20x 7 x 5 = 20 x 5 x 7 = 100 x 7 = 700* • Can use formal methods to solve problems, including multi-step • *Sam and Tom have £67.80 between them. If Sam has £6.20 more than Tom, how much does Tom have?* Fill in the missing numbers: $\square \div 120 = 117 \div 13 = 10800 \div \square = 234 \div \square$ • Can solve problems between fractions and decimals and percentages and express them as equivalent quantities • Jack and Jill each go out shopping. Jack spends ¼ of his money. Jill spends 20% of her money. Frank says Jack spent more because ¼ is greater than 20%. Alice says you cannot tell who spent more. Who do you agree with, Frank or Alice? Explain why? • Using the numbers 3 4 5 and 6 makes this sum have the smallest possible answer: $$\frac{\square}{\square} + \frac{\square}{\square} =$$ • I spent 3/5s of my money and had £1.40 left to buy lunch. How much money did I have to begin with? • Can substitute values into a simple formula to solve problems

- Recognise mixed numbers and improper fractions and convert them from one form to the other
- Add and subtract fractions with the same denominators and with denominators with the same multiples
- Multiply proper fractions and mixed numbers by whole numbers
- Convert between different units of metric measure (k/m) (cm/ml) (g/kg) (l/ml)
- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- Calculate and compare the area of rectangles (including squares) and including using standard units, square cm and square m and estimate the area of irregular shapes
- Estimate and identify the volume
- Draw given angles and measure them in degrees
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles, including finding missing lengths and angles
- Identify angles at a point, straight line and a quarter turn
- Identify and describe and represent the position of shapes after reflection and translation
- Identify 3D shapes from 2D representations
- Complete, read and interpret information in tables, including timetables and line graphs – identifying patterns and trends

- Find the perimeter of a rectangle or the area of a triangle
- A rectangle has a perimeter of 20. What is the largest possible area it could have?
- Can calculate with measures (time, capacity, length, mass)
- True or false? 1.5kg + 600 g = 2.1kg + 300g
  32 cm + 1.05m = 150 cm – 0.13 m
  3/4 L + 0.05 L = half of 1.6 L
  Explain your reasoning
- Can apply angle properties in different contexts
- The pupil can construct a triangle with angles of 48 degrees 60 degrees and 72 degrees and draw any rectilinear shape, with given dimensions, to the nearest millimetre

Year 6 Expected	Year 6 Greater Depth
- Can demonstrate an understanding of place value, including large numbers and decimals (e.g. what is the value of the '7' in 276,541?; find the difference between the largest and smallest whole numbers that can be made from using three digits; 8.09 = 8 + 9 ?; 28.13 = 28 + + 0.03) - Rounding any whole numbers to a given degree of accuracy - Use negative numbers in context including calculating intervals across zero - Perform mental calculations including mixed operations and large numbers, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation (e.g. 53 – 82 + 47 = 53 + 47 – 82 = 100 – 82 = 18; 20 × 7 × 5 = 20 × 5 × 7 = 100 × 7 = 700; 53 ÷ 7 + 3 ÷ 7 = (53 +3) ÷ 7 = 56 ÷ 7 = 8) - Can use formal methods to solve multi-step problems (e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?) Follow calculation policy - Use knowledge of the order of operations to carry out calculation using the four operations (BODMAS) - Can recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as 1 5 or 0.2 or 20% of the whole cake) - Express a remainder as a decimal or fraction - Add and subtract fractions with different denominations and mixed numbers - Multiply pairs of proper fractions and divide fractions by whole numbers - Use common factors to simplify fractions, compare and order fractions including fractions greater than one	- Can work in a systematic, logical way to find patterns, generalise and justify mathematical thinking - Have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems, using mathematical language

- Can calculate using fractions, decimals or percentages (e.g. knowing that 7 divided by 21 is the same as 7 21 and that this is equal to 1 3; 15% of 60; 11 2 + 3 4; 7 9 of 108; 0.8 x 70).
- Can substitute values into a simple formula to solve problems (e.g. perimeter of a rectangle or area of a triangle).
- Generate and describe linear number sequences
- Express missing number problems algebraically
- Find pairs of numbers that satisfies an equations with 2 unknown
- Enumerate possibilities of combinations of 2 variables
- Can calculate with measures (e.g. calculate length of a bus journey given start and end times; convert 0.05km into m and then into cm).
- Convert between miles and km
- Calculate and compare volumes of cubes and cuboids
- Solve problems involving ratio and scale factor
- Can reason why shapes with the same area can have different perimeters (and vice versa)
- Calculate areas of parallelograms and triangles
- Can use mathematical reasoning to find missing angles (e.g. the missing angle in an isosceles triangle when one of the angles is given; the missing angle in a more complex diagram using knowledge about angles at a point and vertically opposite angles)
- Draw 2D shapes using given angles and dimensions
- Illustrate and name parts of the circle including radius, diameter and circumference
- Interpret, construct and solve problems involving pie charts and line graphs
- Calculate the means as the average
- Draw, translate and reflect points and shapes on a 4 quadrant grid including 2 step questions