

Sheep Dip Lane Academy

Scheme of Learning for Mathematics

What our children say about Mathematics

Children at Sheep Dip Lane Primary Academy say they enjoy Mathematics because they like being able to do sums that help them when working out problems. They enjoy arithmetic lessons because they have to think quickly and recall facts they know, they especially love times table raps/songs.

Sheep Dip essentials for this subject:

- Our children leave School as numerate children equipped with the ability to persevere, take on challenges and communicate mathematically.
- Pupils are prepared for real life and are used to using mathematics across a range of situations and subjects.
- Daily mental maths and arithmetic practise allows pupils to become fluent in the fundamentals of mathematics.
- Children are regularly presented with problem solving activities which challenge their thinking and allow them to use and apply their skills.
- The children use and hear accurate and appropriate mathematical language in a range of situations

How Mathematics is taught in our school

In foundation Stage we follow the Early Years Foundation Stage Profile. On entry into both Foundation 1 and 2, we baseline the pupils so that we can create personalized learning programmes for all our pupils. We assess pupils each term to ensure that they are making progress and then implement any intervention that is required on levels for all pupils in order to ensure that they make rapid progress.

In Key Stage 1 and Key Stage 2 Mathematics is taught on a daily basis. We pre-assess pupils before we teach each unit of learning in order to ensure that we pitch learning at the right level for each pupil. We set success criteria (individual targets) based on the pre-assess so that we can ensure all pupils are making progress within the lessons and over the unit of learning.

In line with the National Curriculum, we teach pupils arithmetic and rapid recall skills on a weekly basis using Big Maths CLIC and beat that. In lessons each year group has Age-related Objectives which we assess the pupils against these on an on-going basis. Each term, we implement summative assessment to ensure pupils are using and applying their learning. We also have Mastery Level Statements for pupils who have independently achieved the Age related Objectives.

In all our lessons, we try to promote concrete mathematics, using resources to explore the concepts we are teaching. This allows for greater depth of learning as pupils are able to manipulate different resources to explain the concept.

Year 1

Rapid Recall & Arithmetic Skills

Counting	Calculation Skills	Shape, Space and Measure
<p>Recognition</p> <ul style="list-style-type: none"> I can say number names up to 100 I can say odd number to 20 I can say even numbers to 20 I can recognize patterns in numbers (0,5,10,15) I can estimate up to 20 objects <p>Counting</p> <ul style="list-style-type: none"> I can count forwards in 1s to 100 I can count backwards in 1s from 100 I can forwards in 2s to 20 I can count backwards in 2s from 20 I can count forwards in 5s to 50 I can count forwards in 5s to 50 	<p>Addition</p> <ul style="list-style-type: none"> I know adding means a bigger total I know when to add I recognize the + sign I can read and interpret a number sentence I can add 2 numbers to make 5 ($1+4=5$ $2+3=6$) I can add 2 numbers to make 6 ($1+5=6$ $2+4=6$) I know that $5+5=10$ I can add 2 numbers to make 10 ($8+2=10$) I can add 2 1 digit numbers ($3+4=7$) I can add a 1 digit to a 'teen number' ($12+1=13$) I can add double numbers up 10 ($1+1$ $2+2$) I can add a multiple of 10 to any number ($22+10$) ($22+20$) I can put the largest number first when adding I can partition 10s and 1s ($17=10+7$) I can solve and addition number sentence <p>Subtraction</p> <ul style="list-style-type: none"> I know subtraction means a smaller total I know when to subtract I recognize the – sign I can read and interpret a number sentence I can subtract 2 single digit numbers ($8-3=5$) I can subtract 1 digit from 2 digits ($12-1=11$) I can solve a subtraction number sentence <p>Multiplication</p> <ul style="list-style-type: none"> I know multiply means 'lots of' I can group objects into 'lots' I can count to find the total <p>Division</p> <ul style="list-style-type: none"> I know dividing means 'sharing' I can 'share' and even number of objects I can count to find the total I can halve even numbers up to 10 	<p>End of Year Outcomes</p> <p>Shape</p> <ul style="list-style-type: none"> I can name 2D shapes (circle,rectangle,square,triangle) I can name 3D shapes (cube, cuboid, sphere, pyramid) I can identify 2D/3D shapes in the environment I can re-call 3D shape properties (sides,faces) <p>Space</p> <ul style="list-style-type: none"> I know which way is left I know which way I right I can follow position instructions (in front, behind, next to, behind) I can turn half a turn I can turn a full turn <p>Measure</p> <ul style="list-style-type: none"> I can describe lengths as longer/shorter longest/shortest I can describe weight as heavy/light heaviest/lightest I can describe full, half full, empty, half empty, nearly empty, nearly full

	40-60+ MONTHS EYFS STATEMENTS	Statutory Requirements YEAR ONE	Statutory Requirements Year Two
NUMBER AND PLACE VALUE	<p>Recognise some numerals of personal significance.</p> <ul style="list-style-type: none"> • Recognises numerals 1 to 5. • Counts up to three or four objects by saying one number name for each item. • Counts actions or objects which cannot be moved. • Counts objects to 10, and beginning to count beyond 10. • Counts out up to six objects from a larger group. • Selects the correct numeral 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. • Finds the total number of items in two groups by counting all of them. • 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. • Records, using marks that they can interpret and explain. • Begins to identify own mathematical problems based on own interests and fascinations. • In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. 	<ul style="list-style-type: none"> a) count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number b) count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens c) given a number, identify one more and one less d) 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 e) read and write numbers from 1 to 20 in numerals and words 	<ul style="list-style-type: none"> a) count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward b) recognise the place value of each digit in a two-digit or/and 3-digit number (hundreds, tens, ones) c) identify, represent and estimate numbers using different representations, including the number line d) compare and order numbers from 0 up to 100; use <, > and = signs e) read and write numbers to at least 100 in numerals and in words f) use place value and number facts to solve problems.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">ADDITION AND SUBTRACTION</p>		<p>a) read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs</p> <p>b) represent and use number bonds and related subtraction facts within 20</p> <p>c) add and subtract one-digit and two-digit numbers to 20, including zero</p> <p>d) solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.</p>	<p>a) solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> • using concrete objects and pictorial representations, including those involving • numbers, quantities and measures • applying their increasing knowledge of mental and written methods <p>b) recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>c) add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> • 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
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">MULTIPLICATION AND DIVISION</p>		<p>a) 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.</p>	<p>a) recall and use multiplication and division facts for the 2, 5, 10 and 3 multiplication tables, including recognising odd and even numbers</p> <p>b) calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs</p> <p>c) show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p> <p>d) solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</p> <p>e) <i>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</i></p>

Fractions

A) recognise, find and name a half as one of two equal parts of an object, shape or quantity

B) recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

- Recognise, find and name fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a length, shape, set of objects or quantity
- Write simple fractions for example $\frac{1}{2}$ of 6 = 3

	40-60+ MONTHS EYFS STATEMENTS	Statutory Requirements YEAR ONE	Statutory Requirements Year Two
MEASUREMENT	<ul style="list-style-type: none"> • Orders two or three items by length or height. • Orders two items by weight or capacity • Uses everyday language related to time. • Beginning to use everyday language related to money. • Orders and sequences familiar events. • Measures short periods of time in simple ways. 	<p>a) compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> • lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] • 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] • time [for example, quicker, slower, earlier, later] <p>b) Measure and begin to record the following:</p> <ul style="list-style-type: none"> • lengths and heights • mass/weight • capacity and volume • time (hours, minutes, seconds) <p>c) Recognise and know the value of different denominations of coins and notes</p> <p>d) sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p> <p>e) recognise and use language relating to dates, including days of the week, weeks, months & years</p> <p>f) tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</p>	<p>a) choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels</p> <p>b) compare and order lengths, mass, volume/capacity and record the results using >, < and =</p> <p>c) recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</p> <p>d) find different combinations of coins that equal the same amounts of money</p> <p>e) solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p> <p>f) compare and sequence intervals of time</p> <p>g) 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</p> <p>h) know the number of minutes in an hour and the number of hours in a day.</p>

	40-60+ MONTHS EYFS STATEMENTS	Statutory Requirements YEAR ONE	Statutory Requirements Year Two
PROPERTIES OF SHAPES	<ul style="list-style-type: none"> Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2-D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Uses familiar objects and common shapes to create and recreate patterns and build models. 	<p>a) Recognise and name common 2-D and 3-D shapes, including:</p> <ul style="list-style-type: none"> 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. <p>b) identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p> <ul style="list-style-type: none"> 	<p>a) identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p> <p>b) identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</p> <p>c) identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</p> <p>d) compare and sort common 2-D and 3-D shapes</p>
POSITION AND DIRECTION	<ul style="list-style-type: none"> Can describe their relative position such as 'behind' or 'next to'. 	<p>a) describe position, direction and movement, including whole, half, quarter and three-quarter turns</p>	<p>a) order and arrange combinations of mathematical objects in patterns and sequences</p> <p>b) 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</p>
STATISTICS		<p><i>a) interpret simple pictograms, tally charts, block diagrams and simple tables</i></p>	<p>b) interpret and construct simple pictograms, tally charts, block diagrams and simple tables</p> <p>c) ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>d) ask and answer questions about totalling and comparing categorical data.</p>

Assessment: At the National Standard: Year 1

Year 1 Expectations: Number	Year 1 Expectations: Measurement and Geometry
• Count reliably to 100	• Recognise all coins: £1; 50p; 20p; 10p; and 1p
• Count on and back in 1s, 2s, 5s, and 10s from any given number to 100	• Recognise and name the 2D shapes: circle; triangle; square and oblong
• Write all numbers in words to 20	• Recognise and name the 3D shapes: cube; sphere; cuboid
• Say the number that is one more or one less than a number to 100	• Name the days of the week and months of the year
• Recall all pairs of additions and subtractions number bonds to 20	• Tell the time to 'o'clock' and half past the hour
• Add and subtract 1-digit and 2-digit numbers to 20, including zero	
• Know the signs (+); (-) and (=)	•
• Solve a missing number problem, such as: $5 = 8 -$	•
• Solve a one-step problem involving an addition and subtraction, using concrete objects, pictorial representations and arrays	•
• Solve a one-step problem involving a multiplication and division, using concrete objects, pictorial representations and arrays	•

Mastery of the National Standard: Year 1

Year 1 Exceeding Expectations:

•Count reliably well beyond 100

•Count on and back in 3s from any given number to beyond 100

•Say the number that is 10 more or 10 less than a number to 100

•Know the signs (+); (-); (=); (<); (>)

•Apply knowledge of number to solve a one-step problem involving a addition, subtraction and simple multiplication and division

•Add and subtract 1-digit and 2-digit numbers to 50, including zero

•Recognise all coins and notes and know their value

•Use coins to pay for items bought up to £1

•Use knowledge of time to know when key periods of the day happen, for example, lunchtime, home time, etc.

•Recognise different 2D and 3D shapes in the environment

Year 2

Rapid Recall & Arithmetic Skills

Counting	Calculation Skills	Shape, Space and Measure
<p>Recognition</p> <ul style="list-style-type: none"> I can say number names up to 100 I can say odd number to 100 I can say even numbers to 100 I can recognize patterns in numbers (0,5,10,15) I can estimate an amount objects <p>Counting</p> <ul style="list-style-type: none"> I can count forwards in 1s to 100 I can count beyond 100 I can count forward in 10s and 1s I can count backwards in 10s and 1s I can count without numbers there I can count backwards in 1s from 100 I can forwards in 2s I can count backwards in 2s I can count forwards in 5s I can count forwards in 5s I can count forwards in 3s I can count backwards in 3s 	<p>Addition</p> <ul style="list-style-type: none"> I can add 2 numbers to make 10 ($8+2=10$) I can add 2 numbers to make 20 ($18+2=20$) I can add multiples of 10 to make 100 ($70+30$) I can add 10 to any 10s number ($20+10=30$) I can add 10 to any number ($33+10=43$) I can add double numbers up to 20 ($11+11$ $12+12$) I can find a missing number for multiples of 20 ($70+_=100$) I know what must be added to any number to find the next multiple ($52+_=60$) I can bridge through 10 when adding ($8+5=$) I can bridge through 10 when adding multiples ($16+9$) I can put the largest number first when adding I can partition 10s and 1s ($17=10+7$) I can combine multiples of 10s and 1s I can add a multiple of 10 and adjust by 1 ($+9 +11$) I can solve an addition number sentence <p>Subtraction</p> <ul style="list-style-type: none"> I can read and interpret a number sentence I can subtract 1 digit numbers ($8-3=5$) I can subtract 1 digit from 2 digits ($12-1=11$) I can solve a subtraction number sentence <p>Multiplication</p> <ul style="list-style-type: none"> I can solve a multiplication number sentence I know my 2 x table I know my 5 x table I know my 10 x table Find the total of a group of objects organized into 2 Find the total of a group of objects organized into 5 Find the total of a group of objects organized into 10 I know that doubling is the same as multiplying by 2 I can double 2 digit numbers by doubling the 10s then the 1s 	<p>Year 1 objectives</p> <p>Shape</p> <ul style="list-style-type: none"> I can name 2D shapes (circle, rectangle, square, triangle) I can name 3D shapes (cube, cuboid, sphere, pyramid) I can identify 2D/3D shapes in the environment I can re-call 3D shape properties (sides, faces) <p>Space</p> <ul style="list-style-type: none"> I know which way is left I know which way I right I can follow position instructions (in front, behind, next to, behind) I can turn half a turn I can turn a full turn <p>Measure</p> <ul style="list-style-type: none"> I can describe lengths as longer/shorter longest/shortest I can describe weight as heavy/light heaviest/lightest I can describe full, half full, empty, half empty, nearly empty, nearly full <p>Year 2 Objectives (End of Year Outcomes)</p> <ul style="list-style-type: none"> I can identify appropriate units of time to measure a durations (minutes, hours, days, weeks, months, years.) I know the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line I know the properties of 3-D shapes, including the number of edges, vertices and faces I can compare and sort common 2-D and 3-D shapes and everyday objects.

	<p>Division</p> <ul style="list-style-type: none"> • I can solve a division number sentence • I can share by 2 • I know division facts for time tables 2,5,10 • I can find half of even numbers to 40 • I know Halving is the inverse of doubling 	
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	Statutory Requirements Year One	Statutory Requirements YEAR TWO	Statutory Requirements Year Three
NUMBER AND PLACE VALUE	<ul style="list-style-type: none"> a) count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number b) count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens c) given a number, identify one more and one less d) 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 e) read and write numbers from 1 to 20 in numerals and words 	<ul style="list-style-type: none"> a) count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward b) recognise the place value of each digit in a two-digit or/and 3-digit number (hundreds, tens, ones) c) identify, represent and estimate numbers using different representations, including the number line d) compare and order numbers from 0 up to 100; use <, > and = signs e) read and write numbers to at least 100 in numerals and in words f) use place value and number facts to solve problems. 	<ul style="list-style-type: none"> a) count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number b) recognise the place value of each digit in a three-digit number (hundreds, tens, ones) c) compare and order numbers up to 1000 d) identify, represent and estimate numbers using different representations e) read and write numbers up to 1000 in numerals and in words f) solve number problems and practical problems involving these ideas. g) round any number to the nearest 10

ADDITION AND SUBTRACTION

- a) read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- b) represent and use number bonds and related subtraction facts within 20
- c) add and subtract one-digit and two-digit numbers to 20, including zero
- d) solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.

- a) **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**
- b) **recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100**
- c) **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**
- d) **recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.**

- a) 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
- b) estimate the answer to a calculation and use inverse operations to check answers
- c) solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

MULTIPLICATION AND DIVISION	<p>a) 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.</p>	<p>a) recall and use multiplication and division facts for the 2, 5, 10 and 3 multiplication tables, including recognising odd and even numbers</p> <p>b) calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs</p> <p>c) show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p> <p>d) solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</p> <p>e) <i>write and calculate mathematical statements for multiplication and division using the</i></p>	<p>a) recall and use multiplication and division facts for the 4, 6 and 8 multiplication tables, beginning to recognise factor pairs</p> <p>b) write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods</p> <p>c) 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.</p>
FRACTIONS	<p>a) recognise, find and name a half as one of two equal parts of an object, shape or quantity</p> <p>b) recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</p>	<p>a) 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</p> <p>b) write simple fractions for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$</p>	<p>a) count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10</p> <p>b) recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</p> <p>c) recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</p> <p>d) recognise and show, using diagrams, equivalent fractions with small denominators</p> <p>e) add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]</p> <p>f) compare and order unit fractions, and fractions with the same denominators</p> <p>g) solve problems that involve all of the above</p> <p>h) <i>find the effect of dividing a one- or two-digit number by 10</i></p>

	Statutory Requirements Year One	Statutory Requirements YEAR TWO	Statutory Requirements Year Three
MEASUREMENT	<p>a) compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] 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] time [for example, quicker, slower, earlier, later] <p>b) Measure and begin to record the following:</p> <ul style="list-style-type: none"> lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) <p>c) Recognise and know the value of different denominations of coins and notes</p> <p>d) sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p> <p>e) recognise and use language relating to dates, including days of the week, weeks, months & years</p>	<p>a) choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels</p> <p>b) compare and order lengths, mass, volume/capacity and record the results using >, < and =</p> <p>c) recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</p> <p>d) find different combinations of coins that equal the same amounts of money</p> <p>e) solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p> <p>f) compare and sequence intervals of time</p> <p>g) 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</p> <p>h) know the number of minutes in an hour and the number of hours in a day.</p> <p><i>i) know the number of seconds in a minute and the number of days in each month, year and leap year</i></p>	<p>a) measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p> <p>b) measure the perimeter of simple 2-D shapes</p> <p>c) add and subtract amounts of money to give change, using both £ and p in practical contexts</p> <p>d) tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12- hour and 24-hour clocks</p> <p>e) 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</p> <p>f) know the number of seconds in a minute and the number of days in each month, year and leap year</p> <p>g) compare durations of events [for example to calculate the time taken by particular events or tasks]</p> <p>i) <i>Convert between different units of measure [for example, kilometre to metre; hour to minute]</i></p>

	Statutory Requirements Year One	Statutory Requirements YEAR TWO	Statutory Requirements Year Three
PROPERTIES OF SHAPES	<p>b) Recognise and name common 2-D and 3-D shapes, including:</p> <ul style="list-style-type: none"> • 2-D shapes [for example, rectangles (including squares), circles and triangles] • 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. <p>b) identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p>	<p>a) identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p> <p>b) identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</p> <p>c) draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</p> <p>d) identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</p> <p>e) compare and sort common 2-D and 3-D shapes and everyday objects.</p>	<p>a) draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</p> <p>b) recognise angles as a property of shape or a description of a turn</p> <p>c) 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</p> <p>d) identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</p> <p>e) <i>identify acute and obtuse angles</i></p>
POSITION AND DIRECTION	<p>a) describe position, direction and movement, including whole, half, quarter and three- quarter turns</p>	<p>a) order and arrange combinations of mathematical objects in patterns and sequences</p> <p>b) 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)</p>	<p>a) <i>describe positions on a 2-D grid as coordinates in the first quadrant</i></p>
STATISTICS	<p>a) <i>interpret simple pictograms, tally charts, block diagrams and simple tables</i></p>	<p>c) interpret and construct simple pictograms, tally charts, block diagrams and simple tables</p> <p>d) ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>e) ask and answer questions about totalling and comparing categorical data.</p>	<p>a) interpret and present data using bar charts, pictograms and tables</p> <p>b) 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.</p>

Assessment

At the National Standard: Year 2

Year 2 Expectations: Number	Year 2 Expectations: Measurement, Geometry and Statistics
• Read and write numbers to at least 100 in numerals and words	• Choose and use appropriate standard units to estimate length/ height/ temperature and capacity
• Recognise odd and even numbers to 100	• Tell and write the time to 5 minute intervals
• Count in steps of 2, 3 and 5 from 0	• Recognise and use the symbols £ and p when solving problems involving addition and subtraction of money
• Recognise place value of each digit in 2-digit numbers	• Describe the properties of 2D and 3D shapes to include: edges, vertices and faces
• Compare and order numbers from 0 to 100 using the >; <; and = signs	• Interpret and construct pictograms, tally charts, block diagrams and simple tables
• Name the fractions $\frac{1}{3}$; $\frac{1}{4}$; $\frac{1}{2}$ and $\frac{3}{4}$ and find fractional values of shapes; lengths and numbers	•
• Recall and use multiplication and division facts for the 2, 5 and 10x multiplication tables	•
• Add and subtract: two 1-digit; 2-digit and a 1 digit; 2-digit and 10s; two 2-digit and three 1-digit numbers	•
• Solve problems with addition and subtraction	•
• Understand commutativity in relation to addition, subtraction, multiplication and division	•

Mastery of the National Standard: Year 2

Year 2 Exceeding Expectations:

•Count reliably up to 1000 in 2s, 5s and 10s

•Count on and back in multiples of 4, 8, 25, 50 and 100 from any given number to beyond 1000

•Add and subtract fractions with a common denominator

•Apply knowledge of number up to 100 to solve a one-step problem involving a addition, subtraction and simple multiplication and division

•Apply knowledge of addition and subtraction to pay for items, up to £10, within a problem solving context

•Add and subtract two 2-digit and numbers to 100

•Use an appropriate strategy to add and subtract numbers that move between and through 100, for example, $97 + 7$; $103 - 8$

•Know about right angles and where they can be seen in the environment

•Tell time to 5 minute intervals in both analogue and digital and relate one to the other

•Measure, compare, add and subtract using common metric measures

Interim Assessment Framework KS1

Working Towards the Expected Standard

- The pupil can demonstrate an understanding of place value, though may still need to use apparatus to support them (e.g. by stating the difference in the tens and ones between 2 numbers i.e. 77 and 33 has a difference of 40 for the tens and a difference of 4 for the ones;
by writing number statements such as $35 < 53$ and $42 > 36$).
- The pupil can count in twos, fives and tens from 0 and use counting strategies to solve problems (e.g. count the number of chairs in a diagram when the chairs are organised in 7 rows of 5 by counting in fives).
- The pupil can read and write numbers correctly in numerals up to 100 (e.g. can write the numbers 14 and 41 correctly).
- The pupil can use number bonds and related subtraction facts within 20 (e.g. $18 = 9 + ?$; $15 = 6 + ?$).
- The pupil can add and subtract a two-digit number and ones and a two-digit number and tens where no regrouping is required (e.g. $23 + 5$; $46 + 20$), they can demonstrate their method using concrete apparatus or pictorial representations.
- The pupil can recall doubles and halves to 20 (e.g. pupil knows that double 2 is 4, double 5 is 10 and half of 18 is 9).

The pupil can recognise and name triangles, rectangles, squares, circles, cuboids, cubes, pyramids and spheres from a group of shapes or from pictures of the shapes.

Working at the Expected Standard

- The pupil 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).
- The pupil can add 2 two-digit numbers within 100 (e.g. $48 + 35$) and can demonstrate their method using concrete apparatus or pictorial representations.
- The pupil can use estimation to check that their answers to a calculation are reasonable (e.g. knowing that $48 + 35$ will be less than 100).
- The pupil can subtract mentally a two-digit number from another two-digit number when there is no regrouping required (e.g. $74 - 33$).
- The pupil can recognise the inverse relationships between addition and subtraction and use this to check calculations and work out missing number problems (e.g. $\Delta - 14 = 28$).
- The pupil 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 $35 \div 5 = 7$; sharing 40 cherries between 10 people and writing $40 \div 10 = 4$; stating the total value of six 5p coins).
- The pupil can identify $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{4}$ and knows that all parts must be equal parts of the whole.
- The pupil 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).
- The pupil can read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given (e.g. pupil reads the temperature on a thermometer or measures capacities using a measuring jug).
- The pupil can read the time on the clock to the nearest 15 minutes.
- The pupil 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).

Working at Greater Depth

- The pupil can reason about addition (e.g. pupil can reason that the sum of 3 odd numbers will always be odd).
- The pupil 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).
- The pupil can work out mental calculations where regrouping is required (e.g. $52 - 27$; $91 - 73$).
- The pupil can solve more complex missing number problems (e.g. $14 + \square - 3 = 17$; $14 + \Delta = 15 + 27$).
- The pupil can determine remainders given known facts (e.g. given $15 \div 5 = 3$ and has a remainder of 0, pupil recognises that $16 \div 5$ will have a remainder of 1; knowing that $2 \times 7 = 14$ and $2 \times 8 = 16$, pupil explains that making pairs of socks from 15 identical socks will give 7 pairs and one sock will be left).
- The pupil can solve 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?).
- The pupil can recognise the relationships between addition and subtraction and can rewrite addition statements as simplified multiplication statements (e.g. $10 + 10 + 10 + 5 + 5 = 3 \times 10 + 2 \times 5 = 4 \times 10$).
- The pupil can find and compare fractions of amounts (e.g. $\frac{1}{4}$ of £20 = £5 and $\frac{1}{2}$ of £8 = £4 so $\frac{1}{4}$ of £20 is greater than $\frac{1}{2}$ of £8).
- The pupil can read the time on the clock to the nearest 5 minutes.
- The pupil can read scales in divisions of ones, twos, fives and tens in a practical situation where not all numbers on the scale are given.
- The pupil 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).

Year 3

Rapid Recall & Arithmetic Skills

Counting	Calculation Skills	Written Methods	Shape, Space and Measure Rapid Recall of known facts/ vocabulary
<ul style="list-style-type: none"> I can count forwards and backwards from 0 in multiples of 4, 8, 50 and 100 I can read numbers up to 1000 and write in digits and words 	<p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> I can solve missing number statements with multiplication and division I know multiplication facts for 3, 4 and 8 times tables and corresponding division facts. I can multiply three single-digit numbers I know that the digits move one or two places to the left when multiplying by 10 or 100 and a zero is used as a place holder. <p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> I can add and subtract a single digit number or a multiple of 10 from a 3-digit number I can add and subtract a multiple of 100 from a 3-digit number I can add and subtract fractions with the same denominator, within 1 I can add and subtract two two-digit numbers where the answer is greater than 100 I can add several 	<ul style="list-style-type: none"> I can use formal written method for short multiplication I can use formal written method for short division I can use formal written method for column addition and subtraction (Y2 skill) 	<p><u>Year 2 Objectives</u></p> <ul style="list-style-type: none"> I can identify appropriate units of time to measure a durations (minutes, hours, days, weeks, months, years.) I know the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line I know the properties of 3-D shapes, including the number of edges, vertices and faces I can compare and sort common 2-D and 3-D shapes and everyday objects. <p><u>Year 3 Objectives (End of Year Outcomes)</u></p> <ul style="list-style-type: none"> I know the relationship between days, weeks, months, years and leap years. Know the number of seconds in a minute, minutes in an hour, hours in a day and days in a weeks. I can convert between different units of measure [for example, kilometre to metre; hour to minute] I can name horizontal and vertical lines and pairs of perpendicular and parallel lines. I can name acute and obtuse angles

	Statutory Requirements Year Two	Statutory Requirements YEAR THREE	Statutory Requirements Year Four
NUMBER AND PLACE VALUE	<p>a) count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward</p> <p>b) recognise the place value of each digit in a two-digit or/and 3-digit number (hundreds, tens, ones)</p> <p>c) identify, represent and estimate numbers using different representations, including the number line</p> <p>d) compare and order numbers from 0 up to 100; use <, > and = signs</p> <p>e) read and write numbers to at least 100 in numerals and in words</p> <p>f) use place value and number facts to solve problems.</p>	<p>h) count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</p> <p>i) recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</p> <p>j) compare and order numbers up to 1000</p> <p>k) identify, represent and estimate numbers using different representations</p> <p>l) read and write numbers up to 1000 in numerals and in words</p> <p>m) solve number problems and practical problems involving these ideas.</p> <p>n) round any number to the nearest 10</p>	<p>a) count in multiples of 7, 9, 25 and 1000</p> <p>b) find 1000 more or less than a given number</p> <p>c) count backwards through zero to include negative numbers</p> <p>d) recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</p> <p>e) order and compare numbers beyond 1000</p> <p>f) identify, represent and estimate numbers using different representations</p> <p>g) round any number to the nearest 10, 100 or 1000</p> <p>h) solve number and practical problems that involve all of the above and with</p> <p>i) increasingly large positive numbers</p>
ADDITION AND SUBTRACTION	<p>a) solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods <p>b) recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>c) add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> • 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 <p>d) recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number</p>	<p>d) add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> • 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 <p>e) estimate the answer to a calculation and use inverse operations to check answers</p> <p>f) solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</p>	<p>a) add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p> <p>b) estimate and use inverse operations to check answers to a calculation</p> <p>c) solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p>

MULTIPLICATION AND DIVISION

- a) recall and use multiplication and division facts for the 2, 5, 10 and 3 multiplication tables, including recognising odd and even numbers
- b) calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs
- c) show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- d) solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
- e) *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*

- a) **recall and use multiplication and division facts for the 4, 6 and 8 multiplication tables, beginning to recognise factor pairs**
- b) **write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods**
- c) **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.**

- a) recall multiplication and division facts for 7, 9, 11 and 12 multiplication tables
- b) 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
- c) recognise and use factor pairs and commutativity in mental calculations
- d) multiply two-digit and three-digit numbers by a one- digit number using formal written layout
- e) 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.
- f) *know and use the vocabulary of prime numbers, prime factors and composite (non-*

- a) 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
- b) write simple fractions for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

- a) **count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10**
- b) **recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators**
- c) **recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators**
- d) **recognise and show, using diagrams, equivalent fractions with small denominators**
- e) **add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]**
- f) **compare and order unit fractions, and fractions with the same denominators**
- g) **solve problems that involve all of the above**
- h) ***find the effect of dividing a one- or two-digit number by 10***

- a) recognise and show, using diagrams, families of common equivalent fractions
- b) count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- c) 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
- d) add and subtract fractions with the same denominator
- e) recognise and write decimal equivalents of any number of tenths or hundredths
- f) recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
- g) 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
- h) round decimals with one decimal place to the nearest whole number
- i) compare numbers with the same number of decimal places up to two decimal places.
- j) Solve simple measures and money problems involving fractions and decimals up to two decimal places.

	Statutory Requirements Year Two	Statutory Requirements YEAR THREE	Statutory Requirements Year Four
MEASUREMENT	<p>a) choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels</p> <p>b) compare and order lengths, mass, volume/capacity and record the results using >, < and =</p> <p>c) recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</p> <p>d) find different combinations of coins that equal the same amounts of money</p> <p>e) solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p> <p>f) compare and sequence intervals of time</p> <p>g) 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</p> <p>h) know the number of minutes in an hour and the number of hours in a day. <i>Know the number of seconds in a minute and the number of days in each month, year and leap year</i></p>	<p>a) measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p> <p>b) measure the perimeter of simple 2-D shapes</p> <p>c) add and subtract amounts of money to give change, using both £ and p in practical contexts</p> <p>d) tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks</p> <p>e) 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</p> <p>f) know the number of seconds in a minute and the number of days in each month, year and leap year</p> <p>g) compare durations of events [for example to calculate the time taken by particular events or tasks]</p> <p>i) <i>Convert between different units of measure [for example, kilometre to metre; hour to minute]</i></p>	<p>a) Convert between different units of measure [for example, kilometre to metre; hour to minute]</p> <p>b) measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>c) find the area of rectilinear shapes by counting squares</p> <p>d) estimate, compare and calculate different measures, including money in pounds and pence</p> <p>e) read, write and convert time between analogue and digital 12- and 24-hour clocks</p> <p>j) solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p>

	Statutory Requirements Year Two	Statutory Requirements YEAR THREE	Statutory Requirements Year Four
PROPERTIES OF SHAPES	<ul style="list-style-type: none"> a) identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line b) identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces c) <i>draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</i> d) identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] e) compare and sort common 2-D and 3-D shapes 	<ul style="list-style-type: none"> a) draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them b) recognise angles as a property of shape or a description of a turn c) 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 d) identify horizontal and vertical lines and pairs of perpendicular and parallel lines. e) <i>identify acute and obtuse angles</i> f) <i>complete a simple symmetric figure with respect to a specific line of symmetry</i> 	<ul style="list-style-type: none"> a) compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes b) identify acute and obtuse angles and compare and order angles up to two right angles by size c) identify lines of symmetry in 2-D shapes presented in different orientations d) complete a simple symmetric figure with respect to a specific line of symmetry. e) <i>know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</i> f) <i>begin to draw given angles, and</i>
POSITION AND DIRECTION	<ul style="list-style-type: none"> a) order and arrange combinations of mathematical objects in patterns and sequences b) 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 	<ul style="list-style-type: none"> a) <i>describe positions on a 2-D grid as coordinates in the first quadrant</i> 	<ul style="list-style-type: none"> a) describe positions on a 2-D grid as coordinates in all four quadrants b) describe movements between positions as translations of a given unit to the left/right and up/down c) plot specified points and draw sides to complete a given polygon
STATISTICS	<ul style="list-style-type: none"> a) interpret and construct simple pictograms, tally charts, block diagrams and simple tables b) ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity c) ask and answer questions about totalling and comparing categorical data. 	<ul style="list-style-type: none"> a) interpret and present data using bar charts, pictograms and tables b) 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. 	<ul style="list-style-type: none"> a) interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. b) solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Assessment at National Standard: Year 3

Year 3 Expectations: Number	Year 3 Expectations: Measurement, Geometry and Statistics
<ul style="list-style-type: none"> • Compare and order numbers to 1000 and read and write numbers to 1000 in numerals and words 	<ul style="list-style-type: none"> • Identify right angles; compare other angles to being greater or smaller than a right angle
<ul style="list-style-type: none"> • Count from 0 in multiples of 4, 8, 50 and 100 	<ul style="list-style-type: none"> • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
<ul style="list-style-type: none"> • Recognise the value of each digit in a 3-digit number 	<ul style="list-style-type: none"> • Tell time to nearest minute and use specific vocabulary: seconds, am and pm
<ul style="list-style-type: none"> • Understand and count in tenths, and find the fractional value of a given set 	<ul style="list-style-type: none"> • Measure, compare, add and subtract using common metric measures
<ul style="list-style-type: none"> • Add and subtract fractions with a common denominator 	<ul style="list-style-type: none"> • Solve one-step and two step problems using information presented in scaled bar charts, pictograms and tables
<ul style="list-style-type: none"> • Derive and recall multiplication facts for 3, 4 and 8x multiplication tables 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Add and subtract mentally combinations of 1-digit and 2-digit numbers 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Add and subtract numbers with up to 3-digits using formal written methods 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Write and calculate mathematical statements for multiplication and division; including 2-digit number with a 1-digit number (from multiplication tables they know, ie, 2, 3, 4, 5, 8 and 10) 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Solve number problems using one and two step operations 	<ul style="list-style-type: none"> •

Mastery of the National Standard: Year 3

Year 3 Exceeding Expectations

•Recognise the value of each digit in a 4-digit number and the value of a tenth

•Know all multiplication facts up to 10×10 and be able to instantaneously answer questions such as, how many 7s in 42?

•Add and subtract numbers with any number of digits using formal written methods

•Begin to have an understanding about negative numbers recognising they are smaller than zero

•Multiply and divide any 2-digit number by a single digit number and have an understanding of 'remainder'

•Can find fractional values (from $\frac{1}{2}$ to $\frac{1}{10}$) of amounts up to 1000

•Use knowledge of number to solve problems related to money, time and measures

•Know that the total internal angles of a triangle measure 180° and can measure each

•Can relate knowledge of time to problems related to timetables

•Measure, compare, add and subtract more complex problems using common metric measures set out in Kg,gms; Kl,litres; Km and metres, etc.

Year 4

Rapid Recall & Arithmetic Skills

Counting	Calculation	Written Methods	Shape, Space and Measure
<ul style="list-style-type: none"> I can count in multiples of 7, 9, 25 and 1000 I can count backwards through zero to include negative numbers 	<p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> I can add two numbers with up to 4-digits I can subtract two numbers with up to 4-digits I can add and subtract fractions with the same denominator <p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> I can multiply by 0 I can multiply and divide by 1 I know multiplication facts and corresponding division facts for the 6, 7, 9, 11 and 12 times tables. I can multiply 3-digit numbers by a single-digit number I can multiply three numbers (including 2-digit numbers) I can divide 2-digit numbers by 10 and 100 I can derive multiples of 100 using known multiplication tables. 	<p><u>Year 3 Objectives</u></p> <ul style="list-style-type: none"> I can use formal written method for short multiplication I can use formal written method for short division <p><u>Year 4 Objectives</u></p> <ul style="list-style-type: none"> Formal written method for subtraction with zeros I can use long multiplication involving numbers up to four-digits by a two-digit number 	<p><u>Year 3 Objectives</u></p> <ul style="list-style-type: none"> I know the relationship between days, weeks, months, years and leap years. Know the number of seconds in a minute, minutes in an hour, hours in a day and days in a weeks. I can name horizontal and vertical lines and pairs of perpendicular and parallel lines. I can name acute and obtuse angles <i>I can convert between different units of measure [for example, kilometre to metre; hour to minute]</i> <p><u>Year 4 Objectives (End of Year Outcomes)</u></p> <ul style="list-style-type: none"> I can convert between different units of measure [for example, kilometre to metre] I can convert from hours to minutes; minutes to seconds; years to months; weeks to days. I can identify different geometric shapes, including

			quadrilaterals and triangles, based on their properties and sizes. <ul style="list-style-type: none"> • I can identify acute, reflex and obtuse angles and order based on their size. • I can identify lines of symmetry in a shape or object.
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	Statutory Requirements Year Three	Statutory Requirements YEAR FOUR	Statutory Requirements Year Five
NUMBER AND PLACE VALUE	a) count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number b) recognise the place value of each digit in a three-digit number (hundreds, tens, ones) c) compare and order numbers up to 1000 d) identify, represent and estimate numbers using different representations e) read and write numbers up to 1000 in numerals and in words f) solve number problems and practical problems involving these ideas. g) round any number to the nearest 10	a) count in multiples of 7, 9, 25 and 1000 b) find 1000 more or less than a given number c) count backwards through zero to include negative numbers d) recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) e) order and compare numbers beyond 1000 f) identify, represent and estimate numbers using different representations g) round any number to the nearest 10, 100 or 1000 h) solve number and practical problems that involve all of the above and with i) increasingly large positive numbers j) 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.	a) read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit b) count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 c) interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero d) round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 e) solve number problems and practical problems that involve all of the above f) read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

ADDITION AND SUBTRACTION

- a) 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
- b) 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.

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

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

- a) recall and use multiplication and division facts for the 4, 6 and 8 multiplication tables, beginning to recognise factor pairs
- b) write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- c) 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.

- a) recall multiplication and division facts for 7, 9, 11 and 12 multiplication tables**
- b) 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**
- c) recognise and use factor pairs and commutativity in mental calculations**
- d) multiply two-digit and three-digit numbers by a one-digit number using formal written layout**
- e) 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.**
- f) know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers**
- g) establish whether a number up to 100 is prime and recall prime numbers up to 19**

- a) identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- b) know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- c) establish whether a number up to 100 is prime and recall prime numbers up to 19
- d) 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
- e) multiply and divide numbers mentally drawing upon known facts
- f) 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
- g) multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- h) recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- i) solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- j) solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- k) solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

- a) count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- b) recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- c) recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- d) recognise and show, using diagrams, equivalent fractions with small denominators
- e) add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]
- f) compare and order unit fractions, and fractions with the same denominators
- g) solve problems that involve all of the above
- c) *find the effect of dividing a one- or two-digit number by 10*

- a) **recognise and show, using diagrams, families of common equivalent fractions**
- b) **count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.**
- c) **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**
- d) **add and subtract fractions with the same denominator**
- e) **recognise and write decimal equivalents of any number of tenths or hundredths**
- f) **recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$**
- g) **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**
- h) **round decimals with one decimal place to the nearest whole number**
- i) **compare numbers with the same number of decimal places up to two decimal places**
- j) **solve simple measure and money problems involving fractions and decimals to two decimal places.**

- a) compare and order fractions whose denominators are all multiples of the same number
- b) identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- c) recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$]
- e) add and subtract fractions with the same denominator and denominators that are multiples of the same number
- f) multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- g) read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]
- h) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- i) round decimals with two decimal places to the nearest whole number and to one decimal place
- j) read, write, order and compare numbers with up to three decimal places
- k) solve problems involving number up to three decimal places
- l) 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
- m) solve problems which require knowing percentage

RATIO AND PROPORTION			<p>a) solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>b) begin to solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>c) begin to solve problems involving unequal sharing</p>
Algebra			<p>a) use simple formulae (e.g. length x width, or $A=lw$ etc.)</p>

	Statutory Requirements Year Three	Statutory Requirements YEAR FOUR	Statutory Requirements Year Five
MEASUREMENT	<p>a) measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p> <p>b) measure the perimeter of simple 2-D shapes</p> <p>c) add and subtract amounts of money to give change, using both £ and p in practical contexts</p> <p>d) tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks</p> <p>e) 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</p> <p>f) know the number of seconds in a minute and the number of days in each month, year and leap year</p> <p>g) compare durations of events [for example to calculate the time taken by particular events or tasks]</p>	<p>a) Convert between different units of measure [for example, kilometre to metre; hour to minute]</p> <p>b) measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>c) find the area of rectilinear shapes by counting squares</p> <p>d) estimate, compare and calculate different measures, including money in pounds and pence</p> <p>e) read, write and convert time between analogue and digital 12- and 24-hour clocks</p> <p>f) solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p>	<p>a) convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)</p> <p>b) understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</p> <p>c) measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</p> <p>d) 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</p> <p>e) estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]</p> <p>f) solve problems involving converting between units of time</p> <p>k) use all four operations to solve problems involving measure [for example, length, mass, volume,</p>

	Statutory Requirements Year Three	Statutory Requirements YEAR FOUR	Statutory Requirements Year Five
PROPERTIES OF SHAPES	<p>a) draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</p> <p>b) recognise angles as a property of shape or a description of a turn</p> <p>c) 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</p> <p>d) identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</p> <p>e) <i>identify acute and obtuse angles</i></p> <p>f) <i>complete a simple symmetric figure with respect to a specific line of symmetry</i></p>	<p>a) compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</p> <p>b) identify acute and obtuse angles and compare and order angles up to two right angles by size</p> <p>c) identify lines of symmetry in 2-D shapes presented in different orientations</p> <p>d) complete a simple symmetric figure with respect to a specific line of symmetry.</p> <p>e) <i>know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</i></p> <p>f) <i>begin to draw given angles, and measure them in degrees (°)</i></p>	<p>a) identify 3-D shapes, including cubes and other cuboids, from 2-D representations</p> <p>b) know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</p> <p>c) draw given angles, and measure them in degrees (°)</p> <p>d) identify:</p> <ul style="list-style-type: none"> • angles at a point and one whole turn (total 360°) • angles at a point on a straight line and ½ a turn (total 180°) • other multiples of 90° • (Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing
POSITION AND	<p><i>a) describe positions on a 2-D grid as coordinates in the first quadrant</i></p>	<p>a) describe positions on a 2-D grid as coordinates in all four quadrants</p> <p>b) describe movements between positions as translations of a given unit to the left/right and up/down</p> <p>c) plot specified points and draw sides to complete a given polygon</p>	<p>a) 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</p> <p><i>b) describe positions on the full coordinate grid (all four quadrants)</i></p>
STATISTICS	<p>a) interpret and present data using bar charts, pictograms and tables</p> <p>b) 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.</p>	<p>a) interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</p> <p>b) solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</p>	<p>a) solve comparison, sum and difference problems using information presented in a line graph</p> <p>b) complete, read and interpret information in tables, including timetables</p>

Assessment at National Standard Year 4

Year 4 Expectations: Number	Year 4 Expectations: Measurement, Geometry and Statistics
<ul style="list-style-type: none"> Recall all multiplication facts to 12 x 12 	<ul style="list-style-type: none"> Compare and classify geometrical shapes, including quadrilaterals and triangles, based on their properties and sizes
<ul style="list-style-type: none"> Round any number to the nearest 10, 100 1000 and decimals with one decimal place to the nearest whole number 	<ul style="list-style-type: none"> Know that angles are measured in degrees and identify acute and obtuse angles and compare and order angles up to two right angles by size
<ul style="list-style-type: none"> Count backwards through zero to include negative numbers 	<ul style="list-style-type: none"> Measure and calculate the perimeter of a rectilinear figure in centimetres and metres
<ul style="list-style-type: none"> Compare numbers with the same number of decimal places up to 2 decimal places 	<ul style="list-style-type: none"> Read, write and convert between analogue and digital 12 and 24 hour clocks
<ul style="list-style-type: none"> Recognise and write decimal equivalents of any number of tenths or hundredths 	<ul style="list-style-type: none"> Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
<ul style="list-style-type: none"> Add and subtract with up to 4 decimal places using formal written methods of columnar addition and subtraction 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Divide a 1 or 2-digit number by 10 or 100 identifying the value of the digits in the answer as units, tenths and hundredths 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Multiply 2-digit and 3-digit numbers by a 1-digit number using formal written layout 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Solve addition and subtraction two-step problems in context and solve problems involving multiplication and division 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Solve simple measures and money problems involving fractions and decimals to 2 decimal places 	<ul style="list-style-type: none">

Mastery of the National Standard: Year 4

Year 5

Rapid Recall
Arithmetic

&
Skills

Year 4 Exceeding Expectations:	
•Use tenths, hundredths and thousandths when comparing values and solving addition and subtraction problems	
•Round any number to 100,000 to the nearest 10, 100, 1,000 or 10,000	
•Relate tenths and hundredths to fractional values	
•Rapidly recall answer when multiplying and dividing a whole or decimal number by 10	
•Solve multi-step problems involving more than one of the operations	
•Work out simple percentage values of whole numbers as is related to on-going learning in science, history and geography	
•Compare and add fractions whose denominators are all multiples of the same number	
•Use a 24-hour timetable to find out times for a journey between various places	
•Use knowledge of perimeter to work out perimeter of large areas around school using metres and centimetres	
•Collect own data on given project and present information in graphical formats of their choosing	

Counting	Calculation	Written	Shape, Space and Measure
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<ul style="list-style-type: none"> count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 	<ul style="list-style-type: none"> I can solve balanced calculations <p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> I can add and subtract whole numbers with more than four digits (and different numbers of digits) I can add and subtract fractions with multiples of the same denominator I can add and subtract whole numbers and mixed decimals <p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> I can find fractions of amounts I can multiply and divide whole numbers and decimals by 10, 100 and 1000 I can multiply up 4-digit numbers by single-digit numbers I can divide a 4-digit number by a single digit number I can divide with remainders I know how to square numbers I know how to cube numbers 	<ul style="list-style-type: none"> Formal written method for subtraction with zeros I can use long multiplication involving numbers up to four-digits by a two-digit number 	<p><u>Year 4 Objectives</u></p> <ul style="list-style-type: none"> I can convert between different units of measure [for example, kilometre to metre] I can convert from hours to minutes; minutes to seconds; years to months; weeks to days. I can identify different geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. I can identify acute, reflex and obtuse angles and order based on their size. I can identify lines of symmetry in a shape or object. I can recognize irregular shapes <p><u>Year 5 (End of Year Outcomes)</u></p> <ul style="list-style-type: none"> I know the approximate equivalences between metric and imperial units <p>Vocabulary I know and can use the vocabulary perpendicular; parallel; perimeter; area; volume; reflex; acute; obtuse</p>
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NUMBER AND PLACE VALUE	<ul style="list-style-type: none"> a) count in multiples of 7, 9, 25 and 1000 b) find 1000 more or less than a given number c) count backwards through zero to include negative numbers d) recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) e) order and compare numbers beyond 1000 f) identify, represent and estimate numbers using different representations g) round any number to the nearest 10, 100 or 1000 h) solve number and practical problems that involve all of the above and with i) increasingly large positive numbers j) 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. 	<ul style="list-style-type: none"> a) read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit b) count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 c) interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero d) round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 e) solve number problems and practical problems that involve all of the above f) read Roman numerals to 1000 (M) and recognise years written in Roman numerals. 	<ul style="list-style-type: none"> a) read, write, order and compare numbers up to 10 000 000 and determine the value of each digit b) round any whole number to a required degree of accuracy c) use negative numbers in context, and calculate intervals across zero, add and subtract positive and negative numbers d) solve number and practical problems that involve all of the above.
ADDITION AND SUBTRACTION	<ul style="list-style-type: none"> a) add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate b) estimate and use inverse operations to check answers to a calculation c) solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. 	<ul style="list-style-type: none"> a) add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) b) add and subtract numbers mentally with increasingly large numbers c) use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy d) solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why 	<ul style="list-style-type: none"> a) perform mental calculations, including with mixed operations and large numbers b) use their knowledge of the order of operations to carry out calculations involving the four operations c) solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why d) solve problems involving addition, subtraction, multiplication and division e) use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

- a) recall multiplication and division facts for 7, 9, 11 and 12 multiplication tables
- b) 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
- c) recognise and use factor pairs and commutativity in mental calculations
- d) multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- e) 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.
- f) *know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers*
- g) *establish whether a number up to 100 is prime and recall prime numbers up to 19*

- a) **identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers**
- b) **know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers**
- c) **establish whether a number up to 100 is prime and recall prime numbers up to 19**
- d) **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**
- e) **multiply and divide numbers mentally drawing upon known facts**
- f) **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**
- g) **multiply and divide whole numbers and those involving decimals by 10, 100 and 1000**
- h) **recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)**
- i) **solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes**
- j) **solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign**
- k) **solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates**

- a) multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- b) divide numbers up to 4 digits by a two-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
- c) 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
- d) perform mental calculations, including with mixed operations and large numbers
- e) identify common factors, common multiples and prime numbers
- f) use their knowledge of the order of operations to carry out calculations involving the four operations
- g) solve problems involving addition, subtraction, multiplication and division
- h) use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

FRACTIONS and Decimals

- a) recognise and show, using diagrams, families of common equivalent fractions
- b) count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- c) 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
- d) add and subtract fractions with the same denominator
- e) recognise and write decimal equivalents of any number of tenths or hundredths
- f) recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
- g) 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
- h) round decimals with one decimal place to the nearest whole number
- i) compare numbers with the same number of decimal places up to two decimal places
- h) solve simple measure and money problems involving fractions and decimals to two decimal places.

- a) compare and order fractions whose denominators are all multiples of the same number**
- b) identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths**
- c) recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$]**
- e) add and subtract fractions with the same denominator and denominators that are multiples of the same number**
- f) multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams**
- g) read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]**
- h) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents**
- i) round decimals with two decimal places to the nearest whole number and to one decimal place**
- j) read, write, order and compare numbers with up to three decimal places**
- k) solve problems involving number up to three decimal places**
- l) 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**
- m) solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.**

- a) use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- b) compare and order fractions, including fractions > 1
- c) add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- d) multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- e) divide proper fractions by whole numbers [for example, $\frac{1}{3}$ divided by 2 = $\frac{1}{6}$]
- f) associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
- g) identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- h) multiply one-digit numbers with up to two decimal places by whole numbers
- i) use written division methods in cases where the answer has up to two decimal places
- j) solve problems which require answers to be rounded to specified degrees of accuracy
- k) recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Ratio and Proportion		<p>a) solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>b) begin to solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>c) begin to solve problems involving unequal sharing (ratio) and grouping using knowledge of fractions and multiples.</p>	<p>a) solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>b) solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>c) solve problems involving similar shapes where the scale factor is known or can be found</p> <p>d) solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>
Algebra		<p>a) use simple formulae (e.g. length x width, or $A=lw$ etc.)</p>	<p>a) use simple formulae</p> <p>b) generate and describe simple number sequences</p> <p>c) express missing number problems algebraically</p> <p>d) Find pairs of numbers which satisfy an equation with two unknowns</p> <p>e) Enumerate possibilities of combinations with two variables.</p>

	Statutory Requirements Year Four	Statutory Requirements YEAR FIVE	Statutory Requirements Year Six
MEASUREMENT	<ul style="list-style-type: none"> a) Convert between different units of measure [for example, kilometre to metre; hour to minute] b) measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres c) find the area of rectilinear shapes by counting squares d) estimate, compare and calculate different measures, including money in pounds and pence e) read, write and convert time between analogue and digital 12- and 24-hour clocks f) solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. 	<ul style="list-style-type: none"> a) convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) b) understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints c) measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres d) 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 e) estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] f) solve problems involving converting between units of time g) use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. 	<ul style="list-style-type: none"> a) solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate b) use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places c) convert between miles and kilometres d) recognise that shapes with the same areas can have different perimeters and vice versa e) recognise when it is possible to use formulae for area and volume of shapes f) calculate the area of parallelograms and triangles g) calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic

	Statutory Requirements Year Four	Statutory Requirements YEAR FIVE	Statutory Requirements Year Six
PROPERTIES OF SHAPES	<p>a) compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</p> <p>b) identify acute and obtuse angles and compare and order angles up to two right angles by size</p> <p>c) identify lines of symmetry in 2-D shapes presented in different orientations</p> <p>d) complete a simple symmetric figure with respect to a specific line of symmetry.</p> <p>e) <i>know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</i></p> <p>f) <i>begin to draw given angles, and measure them in degrees ($^{\circ}$)</i></p>	<p>a) identify 3-D shapes, including cubes and other cuboids, from 2-D representations</p> <p>b) know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</p> <p>c) draw given angles, and measure them in degrees ($^{\circ}$)</p> <p>d) identify:</p> <ul style="list-style-type: none"> • angles at a point and one whole turn (total 360°) • angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) • other multiples of 90° • (Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.) <p>e) use the properties of rectangles to deduce related facts and find missing lengths and angles</p> <p>g) distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</p>	<p>a) draw 2-D shapes using given dimensions and angles</p> <p>b) recognise, describe and build simple 3-D shapes, including making nets</p> <p>c) compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons</p> <p>d) illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</p> <p>e) recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</p>
POSITION AND	<p>a) describe positions on a 2-D grid as coordinates in all four quadrants</p> <p>b) describe movements between positions as translations of a given unit to the left/right and up/down</p> <p>c) plot specified points and draw sides to complete a given polygon</p>	<p>a) 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</p> <p>b) <i>describe positions on the full coordinate grid (all four quadrants)</i></p>	<p>a) revisit describing positions on the full coordinate grid (all four quadrants)</p> <p>b) draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>
STATISTICS	<p>a) interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</p> <p>b) solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</p>	<p>a) solve comparison, sum and difference problems using information presented in a line graph</p> <p>b) complete, read and interpret information in tables, including timetables</p>	<p>a) interpret and construct pie charts and line graphs and use these to solve problems</p> <p>b) calculate and interpret the mean as an average.</p>

Assessment at National Standard Year 5

Year 5 Expectations: Number	Year 5 Expectations: Measurement, Geometry and Statistics
• Count forwards and backwards in steps of power 10 for any given number up to 1,000,000	• Know angles are measured in degrees: estimate and compare acute; obtuse and reflex angles
• Recognise and use thousandths and relate them to tenths, hundreds and decimal equivalents	• Draw given angles and measure them in degrees (°)
• Recognise mixed numbers and improper fractions and convert from one to the other	• Convert between different units of metric measures and estimate volume and capacity
• Read and write decimal numbers as fractions, for example, $0.47 = \frac{47}{100}$	• Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
• Recognise the per cent symbol (%) and understand per cent relates to number of parts per hundred	• Calculate and compare the area of squares and rectangles including using standard units (cm^2 and m^2)
• Write percentages as a fraction with denominator hundred, and as a decimal fraction	• Solve comparison, sum and difference problems using information presented in a line graph
• Compare and add fractions whose denominators are all multiples of the same number	
• Multiply and divide numbers mentally drawing upon known facts up to 12×12	•
• Round any number to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	•
• Round decimals with 2dp to the nearest whole number and to 1 decimal place	•
• Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3)	•
• Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	•
• Multiply number up to 4-digit by a 1 or 2-digit number using formal written methods, including long multiplication for 2-digit numbers	•
• Divide numbers up to 4-digits by 1-digit numbers	•
• Solve problems involving multiplication and division where large numbers are used by decomposing them into factors	•
• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why; solve problems involving 3 decimal places and problems which require knowledge of percentages and decimal equivalents	•

Mastery of the National Standard: Year 5

Year 5 Exceeding Expectations: Number

•Have a concept of numbers well beyond 1,000,000 and their relative association to distances to planets; historical data and geographical aspects

•Divide whole numbers (up to 4 digits) by 2-digit numbers, using preferred method

•Use rounding as a strategy for quickly assessing what approximate answers ought to be before calculating

•Link working across zero for positive and negative numbers to work time between BC and AD in history

•Recognise the symbol for square root ($\sqrt{\quad}$) and work out square roots for numbers up to 100

•Calculate number problems algebraically, for example, $2x - 3 = 5$

•Use knowledge of measurement to create plans of areas around school, such as classroom, field, outside play area, etc.

•Relate imperial measures still used regularly in our society to their metric equivalents, for example, miles to Km and lbs to Kg

•Use a range of timetables to work out journey times on a fictional journey around the world, for example, 'How long would it take to reach the rainforests in the Amazon?'

•Collect own data on personal project and present information in formats of their choosing, charts, graphs and tables

Year 6

Rapid Recall & Arithmetic Skills

Counting	Calculation	Written Methods	Shape, Space and Measure
<ul style="list-style-type: none"> I can count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 I can count forwards and backwards into negative integers through zero. 	<ul style="list-style-type: none"> I can solve calculations involving brackets I can order operations using BIDMAS <p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> I can add and subtract fractions with different denominators I can add and subtract fractions and mixed numbers <p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> I can multiply a one-digit number with up to two decimal places by a whole number I can multiply pairs of simple fractions I can multiply and divide decimals to three decimal places by 10, 100 or 1000 I can find percentages of amounts I can divide, giving an answer to two decimal places I can divide proper fractions by a whole number 	<p><u>Year 5 Objectives</u></p> <ul style="list-style-type: none"> Formal written method for subtraction with zeros I can use long multiplication involving numbers up to four-digits by a two-digit number <p><u>Year 6 Objectives</u></p> <ul style="list-style-type: none"> Formal written method for long division of four-digit numbers by two-digit numbers Long multiplication of up to four digits by a two-digit number 	<p>I know and can use the vocabulary perpendicular; parallel; perimeter; area; volume; circumference; diameter; radius; reflex; acute; obtuse</p>

	Statutory Requirements Year Five	Statutory Requirements YEAR SIX	Statutory Requirements KS3
NUMBER AND PLACE VALUE	<ul style="list-style-type: none"> a) read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit b) count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 c) interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero d) round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 e) solve number problems and practical problems that involve all of the above f) read Roman numerals to 1000 (M) and recognise years written in Roman numerals. 	<ul style="list-style-type: none"> a) read, write, order and compare numbers up to 10 000 000 and determine the value of each digit b) round any whole number to a required degree of accuracy c) use negative numbers in context, and calculate intervals across zero, add and subtract positive and negative numbers d) solve number and practical problems that involve all of the above. 	<ul style="list-style-type: none"> a) understand and use place value for decimals, measures and integers of any size b) order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ c) use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property d) use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations e) round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] f) interpret and compare numbers in standard form $A \times 10^n$ $1 \leq A < 10$, where n is a positive or negative integer or zero g) appreciate the infinite nature of the sets of integers, real and rational numbers h) use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a < x \leq b$
ADDITION AND SUBTRACTION	<ul style="list-style-type: none"> a) add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) b) add and subtract numbers mentally with increasingly large numbers c) use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy d) solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why 	<ul style="list-style-type: none"> a) perform mental calculations, including with mixed operations and large numbers b) use their knowledge of the order of operations to carry out calculations involving the four operations c) solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why d) solve problems involving addition, subtraction, multiplication and division e) use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy 	<ul style="list-style-type: none"> a) use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative b) use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals c) recognise and use relationships between operations including inverse operations

- a) identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- b) know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- c) establish whether a number up to 100 is prime and recall prime numbers up to 19
- d) 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
- e) multiply and divide numbers mentally drawing upon known facts
- f) 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
- g) multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- h) recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- i) solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- j) solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- k) solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

- a) multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication**
- b) divide numbers up to 4 digits by a two-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**
- c) 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**
- d) perform mental calculations, including with mixed operations and large numbers**
- e) identify common factors, common multiples and prime numbers**
- f) use their knowledge of the order of operations to carry out calculations involving the four operations**
- g) solve problems involving addition, subtraction, multiplication and division**
- h) use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy**

- a) use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- b) use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals
- c) recognise and use relationships between operations including inverse operations

- a) compare and order fractions whose denominators are all multiples of the same number
- b) identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- c) recognise mixed numbers and improper fractions and convert from one form to the
- d) other and write mathematical statements > 1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1\ 1/5$]
- e) add and subtract fractions with the same denominator and denominators that are multiples of the same number
- f) multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- g) read and write decimal numbers as fractions [for example, $0.71 = 71/100$]
- h) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- i) round decimals with two decimal places to the nearest whole number and to one decimal place
- j) read, write, order and compare numbers with up to three decimal places
- k) solve problems involving number up to three decimal places
- l) 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
- m) solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those fractions with a denominator of a multiple of 10 or 25.

- a) use common factors to simplify fractions; use common multiples to express fractions in the same denomination**
- b) compare and order fractions, including fractions > 1**
- c) add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions**
- d) multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $1/4 \times 1/2 = 1/8$]**
- e) divide proper fractions by whole numbers [for example, $1/3$ divided by $2 = 1/6$]**
- f) associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $3/8$]**
- g) identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places**
- h) multiply one-digit numbers with up to two decimal places by whole numbers**
- i) use written division methods in cases where the answer has up to two decimal places**
- j) solve problems which require answers to be rounded to specified degrees of accuracy**
- k) recall and use equivalences between simple fractions, decimals and percentages, including in different contexts**

- a) work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $2/7$ or 0.375 and $3/8$)
- b) interpret fractions and percentages as operators

Ratio and Proportion	<p>a) <i>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></p> <p>b) <i>begin to solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</i></p> <p>c) <i>begin to solve problems involving unequal sharing (ratio) and grouping using knowledge of fractions and multiples.</i></p>	<p>a) solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>b) solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>c) solve problems involving similar shapes where the scale factor is known or can be found</p> <p>d) solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>	<p>a) define percentage as ‘number of parts per hundred’, interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%</p> <p>b) change freely between related standard units [for example time, length, area, volume/capacity, mass]</p> <p>c) use scale factors, scale diagrams and maps</p> <p>d) express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1</p> <p>e) use ratio notation, including reduction to simplest form</p> <p>f) divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio</p> <p>g) understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction</p> <p>h) relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions</p> <p>i) solve problems involving percentage change, including: percentage increase, decrease</p> <p>j) and original value problems and simple interest in financial mathematics</p> <p>k) solve problems involving direct and inverse proportion, including graphical and algebraic representations</p> <p>l) use compound units such as speed, unit pricing and density to solve problems.</p>
Algebra	<p>a) use simple formulae (e.g. length x width, or $A=lw$ etc.)</p>	<p>a) use simple formulae</p> <p>b) generate and describe linear number sequences</p> <p>c) express missing number problems algebraically</p> <p>d) find pairs of numbers that satisfy an equation with two unknowns</p> <p>e) enumerate possibilities of combinations of two variables</p>	<p>See separate table below for KS3 Algebra requirements. It is not anticipated that all of these will be addressed, but does enable next steps to be set for more able children.</p>

Algebra at Key Stage Three

- a) use and interpret algebraic notation, including:
 - ab in place of $a \times b$
 - $3y$ in place of $y + y + y$ and $3 \times y$
 - a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$
 - a/b in place of $a \div b$
 - coefficients written as fractions rather than as decimals
 - brackets
- b) substitute numerical values into formulae and expressions, including scientific formulae
- c) understand and use the concepts and vocabulary of expressions, equations,
- d) inequalities, terms and factors
- e) simplify and manipulate algebraic expressions to maintain equivalence by:
 - collecting like terms
 - multiplying a single term over a bracket
 - taking out common factors
 - expanding products of two or more binomials
- f) understand and use standard mathematical formulae; rearrange formulae to change the subject model situations or procedures by translating them into algebraic expressions or formulae and by using graphs
- g) use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)
- h) work with coordinates in all four quadrants
- i) recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane
- j) interpret mathematical relationships both algebraically and reduce a given linear equation in two variables to the standard form $y = mx + c$;
- k) calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically
- l) use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations
- m) find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs
- n) generate terms of a sequence from either a term-to-term or a position-to-term rule
- o) recognise arithmetic sequences and find the n th term recognise geometric sequences and appreciate other sequences that arise.

	Statutory Requirements Year Five	Statutory Requirements YEAR SIX	Statutory Requirements KS3
MEASUREMENT	<ul style="list-style-type: none"> a) convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) b) understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints c) measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres d) 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 e) estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] f) solve problems involving converting between units of time g) use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. 	<ul style="list-style-type: none"> a) solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate b) use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places c) convert between miles and kilometres d) recognise that shapes with the same areas can have different perimeters and vice versa e) recognise when it is possible to use formulae for area and volume of shapes f) calculate the area of parallelograms and triangles g) calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]. 	<ul style="list-style-type: none"> a) use standard units of mass, length, time, money and other measures, including with decimal quantities b) derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) c) derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line <p>Objectives for Measurement and Geometry at KS3 are not exhaustive but give an indication of next steps.</p>

	Statutory Requirements Year Five	Statutory Requirements YEAR SIX	Statutory Requirements KS3
PROPERTIES OF SHAPES	<p>a) identify 3-D shapes, including cubes and other cuboids, from 2-D representations</p> <p>b) know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</p> <p>c) draw given angles, and measure them in degrees ($^{\circ}$)</p> <p>d) identify:</p> <ul style="list-style-type: none"> • angles at a point and one whole turn (total 360°) • angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) • other multiples of 90° • (Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.) <p>e) use the properties of rectangles to deduce related facts and find missing lengths and angles</p> <p>h) distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</p>	<p>a) draw 2-D shapes using given dimensions and angles</p> <p>b) recognise, describe and build simple 3-D shapes, including making nets</p> <p>c) compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons</p> <p>d) illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</p> <p>e) recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</p>	<p>a) calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes</p> <p>b) draw and measure line segments and angles in geometric figures, including</p> <p>c) interpreting scale drawings</p> <p>d) describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric</p> <p>e) use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles</p> <p>f) derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies</p> <p>g) use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D</p>
POSITION AND	<p>a) 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</p> <p>b) <i>describe positions on the full coordinate grid (all four quadrants)</i></p>	<p>a) revisit describing positions on the full coordinate grid (all four quadrants)</p> <p>b) draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>	
STATISTICS	<p>a) solve comparison, sum and difference problems using information presented in a line graph</p> <p>b) complete, read and interpret information in tables, including timetables</p>	<p>a) interpret and construct pie charts and line graphs and use these to solve problems</p> <p>b) calculate and interpret the mean as an average.</p>	<p>a) describe, interpret and compare observed distributions of a single variable through:</p> <p>b) appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)</p> <p>c) construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data</p> <p>d) describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs</p>

Probability

- record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes,
- using appropriate language and the 0-1 probability scale
- understand that the probabilities of all possible outcomes sum to 1
- enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams
- generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.

Assessment at the National Standard: Year 6

Year 6 Expectations: Number	Year 6 Expectations: Measurement, Geometry and Statistics
• Use negative numbers in context, and calculate intervals across zero	• Recognise, describe and build simple 3D shapes, including making nets
• Round any whole number to a required degree of accuracy and solve problems which require answers to be rounded to a specific degree of accuracy	• Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangle, quadrilateral and regular polygons
• Solve problems involving the relative sizes of two quantities where the missing values can be found by using integer multiplication and division facts	• Illustrate and name parts of circles, including radius, diameter and circumference and know that the radius is half the diameter
• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	• 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 3 decimal places
• Solve problems involving the calculation of percentages, (for example, of measures) such as 20% of 440 and the use of percentages for comparison	• Calculate the area of a parallelogram and triangles and calculate, estimate and compare volume of cubes and cuboids using standard units
• Multiply 1-digit numbers with up to two decimal places by whole numbers	• Interpret and construct pie charts and line graphs and use these to solve problems
• Perform mental calculations, including with mixed operations with large numbers	•
• Divide numbers up to 4-digits by a 2-digit whole number using formal written methods of long division and interpret remainder in various ways	•
• Use knowledge of order of operations to carry out calculations involving all four operations	•
• Add and subtract fractions with different denominators 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 ($\frac{1}{8} \div 2 = \frac{1}{16}$)	•
• Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375 for $\frac{3}{8}$)	•
• Express missing number problems algebraically	•
• Find pairs of numbers that satisfy number sentences involving two unknowns	•

Mastery of the National Standard: Year 6

Year 6 Exceeding Expectations: Number

• Compare, order and convert between fractions, decimals and percentages in contexts related to science, history or geography learning

• Move beyond squared and cubed numbers to calculate problems such as $X \times 10^n$ where n is positive

• Use $=$, \neq , $<$, $>$, \leq , \geq correctly

• Multiply all integers, (using efficient written methods) including mixed numbers and negative numbers

• Recognise an arithmetic progression and find the n th term

• Use formula for measuring area of shape, such as cuboid and triangle to work out area of irregular shape in the school environment

• Use four operations with mass, length, time, money and other measures, including with decimal quantities

• Create a scaled model of an historical or geographical structure showing an acceptable degree of accuracy using known measurements

• Calculate costs and time involved to visit a destination in another part of the world relating to on-going learning in history or geography

• Collect own data on personal project and present information in formats of their choosing, charts, graphs and tables and answer specific questions related to their research

KS2

Interim teacher assessment framework at the end of key stage 2: mathematics

Working at the expected standard

- The pupil 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; $8.09 = 8 + \frac{9}{100}$; $28.13 = 28 + 0.03$).
- The pupil can calculate mentally, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation (e.g. $53 - 82 + 47 = 53 + 47 - 82 = 100 - 82 = 18$; $20 \times 7 \times 5 = 20 \times 5 \times 7 = 100 \times 7 = 700$; $53 \div 7 + 3 \div 7 = (53 + 3) \div 7 = 56 \div 7 = 8$).
- The pupil 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?).
- The pupil 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 $\frac{1}{5}$ or 0.2 or 20% of the whole cake).
- The pupil can calculate using fractions, decimals or percentages (e.g. knowing that 7 divided by 21 is the same as $\frac{7}{21}$ and that this is equal to $\frac{1}{3}$; 15% of 60; $1\frac{1}{2} + \frac{3}{4}$; $\frac{7}{9}$ of 108; 0.8×70).
- The pupil can substitute values into a simple formula to solve problems (e.g. perimeter of a rectangle or area of a triangle).
- The pupil 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).
- The pupil 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).