

To work mathematically - Curriculum

Numbers & Number System	Foundation	Year 1	Year 2	Year 3
Counting	<ul style="list-style-type: none"> Count reliably with numbers from 1 to 20 Sequence numbers to 20 Say which number is one more or one less than a given number. 	<ul style="list-style-type: none"> Recite numbers in order (forwards from 1 to 100, backwards from 20 to 0); Read & write numerals from 0 to 20 Count objects up to 20. Count on in tens from 0 or a single-digit number to 100 or just over. Count on in twos, beginning to recognise odd/even numbers to 20. Within the range 0 to 30, say the number that is 1 or 10 more or less than any given number. 	<ul style="list-style-type: none"> Count to & across 100 forwards and backwards, beginning with 0 or 1 or from any given number; Count, read & write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s; Identify 1 more and 1 less Count in steps of 2,3,5 and 10 from 0 or 1 & in tens from any number, forward & backward. Use grouping in 2s, 5s and 10s to count larger groups of objects. Understand odd and even numbers & recognise these up to at least 20. 	<ul style="list-style-type: none"> Recite numbers 100 to 200 & beyond. Count on & back in ones, tens and hundreds from two and three digit numbers. Count on & back in steps of 2,3,4 and 5 to at least 50 Find 1,10, 100 more/less than two and three digit numbers.
Representing	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Give a sensible estimate of some objects that can be checked by counting eg to 30. 	<ul style="list-style-type: none"> Identify, represent & estimate numbers using different representations, inc the number line; Read & write numbers from 1 to 100 in numerals & in words. 	<ul style="list-style-type: none"> Read & write numbers to at least 1000. Place a three-digit number on a number line marked off in multiples of 100 and 10. Give a sensible estimate of a number as a range eg 30 to 50 by grouping in tens.
Comparing	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Use more or less to compare two numbers, & give a number which lies between them. Order numbers to at least 20, positioning on a number track; use ordinal numbers. Use the = sign to represent equality. 	<ul style="list-style-type: none"> Use the language of equal to, more than, less than (fewer), most & least; Compare & order numbers from 0 up to 100, use <, > and = signs. Round two-digit numbers to the nearest multiple of ten. Place a two-digit number on a number line marked off in multiples of ten. 	<ul style="list-style-type: none"> Round two-digit numbers to the nearest 10 & round three-digit numbers to the nearest 100. Compare three-digit numbers, use < and > signs and find a number in between. Order two and three-digit numbers.
Place value		<ul style="list-style-type: none"> Begin partitioning two-digit numbers into tens and ones and reverse. 	<ul style="list-style-type: none"> Recognise the place value of each digit in a two-digit number (tens & ones). 	<ul style="list-style-type: none"> Understand what each digit represents in three-digit numbers & partition into hundreds, tens and units. Multiply two-digit numbers by 10 & understand the effect.
Solving problems			<ul style="list-style-type: none"> Use place value & number facts to solve problems. 	<ul style="list-style-type: none"> Find half of odd and even numbers to 40, using notation such as $13 \frac{1}{2}$.

Numbers & Number System	Year 4	Year 5	Year 6
Counting	<ul style="list-style-type: none"> Count in multiples of 2 to 9, 25, 50, 100 & 1000. Count on & back in ones, tens, hundreds & thousands from four-digit numbers. Find 1000 more or less than a given number. Count backwards through zero to include negative numbers. Find multiples of 10, 100, 1000 more/less than numbers of up to four digits eg $3407 + 20$ 	<ul style="list-style-type: none"> Count on & back in steps of constant size, extending beyond zero. Know what each digit represents in five and six-digit numbers. Recognise & extend number sequences. Recognise odd and even numbers & multiples of 5, 10, 25, 50 and 100 up to 1000. Make general statements about sums, differences & multiples of odd & even numbers. 	<ul style="list-style-type: none"> Read numbers up to 10,000,000. Use negative numbers in context & calculate intervals across zero. Count on & back in fractions & decimals & repeated steps of whole numbers & through zero. Recognise & extend number sequences.
Representing	<ul style="list-style-type: none"> Identify, represent & estimate numbers up to 10,000. Read Roman numerals to 100 & know that over time, the numeral system changed to include the concept of zero & place value. Use decimal notation for tenths & hundredths in context eg length. Use decimal notation & place value for tenths & hundredths in context eg order amounts of money; convert a sum of money such as £13.25 to pence or a length such as 125cm to metres; round a sum of money to the nearest pound. Position accurately numbers up to 1000 on an empty number line or line marked off in multiples of 10 or 100. Estimate where three and four-digit numbers lie on empty 0-1000 or 0-10,000 lines. 	<ul style="list-style-type: none"> Use decimal notation for tenths & hundredths & understand what each digit represents. 	<ul style="list-style-type: none"> Write numbers up to 10,000,000. Read Roman numerals to 1000 & recognise years written in Roman numerals. Make & justify estimates & approximations of large numbers. Estimate where four-digit numbers lie on an empty 0-10,000 line. Order numbers with up to two decimal places. Recognise & use decimals with up to three places in the context of measurement. Recognise prime numbers up to 20 & find all prime numbers less than 100.
Comparing	<ul style="list-style-type: none"> Order & compare numbers beyond 1000. Recognise multiples of 5, 10 and 100 up to 1000. Round three- and four-digit numbers to the nearest 10 or 100. Compare pairs of three-digit or four-digit numbers, using the < and > signs, & find a number in between each pair. 	<ul style="list-style-type: none"> Round four-digit numbers up to the nearest 10, 100 or 1000. Round a number with one or two decimal places to the nearest whole number. Round a number with one or two decimal places to the nearest whole number. Order & compare numbers up to 1,000,000 using the < and > signs. Order & compare negative & positive numbers on a number line & temp scale. Order numbers with one or two decimal places & compare using the < and > signs. 	<ul style="list-style-type: none"> Order & compare numbers up to 10,000,000. Round whole numbers to the nearest 10, 100 or 1000. Round a number with two decimal places to the nearest tenth or to the nearest whole number. Order & compare positive numbers to one million & negative integers to an appropriate level. Use the <, > and = signs correctly.
Place value	<ul style="list-style-type: none"> Recognise the place value of each digit in a four-digit number. Round any number to the nearest 10, 100 or 1000. Multiply & divide three-digit numbers by 10 (whole number answers) & understand the effect; begin to multiply numbers by 100 & perform related divisions. 	<ul style="list-style-type: none"> Partition any number up to 1,000,000 into thousands, hundreds, tens & units. Multiply & divide any number from 1 to 10,000 by 10 or 100 and understand the effect. 	<ul style="list-style-type: none"> Round any whole number to a required degree of accuracy. Determine the value of each digit in any number, up to 1 million. Know what each digit represents in one- and two-place decimal numbers.

			<ul style="list-style-type: none"> • Multiply & divide any whole number from 1 to 10,000 by 10, 100 or 1000 and explain the effect. • Multiply & divide any whole number from 1 to 10,00 by 10, 100 or 1000 & explain the effect. • Multiply & divide decimals by 10 or 100 (answers up to two decimal places for division)
Solving problems	<ul style="list-style-type: none"> • Solve number & practical problems with increasingly large positive numbers. • Recognise odd & even numbers, making general statements about the sums & differences of odd & even numbers. 		<ul style="list-style-type: none"> • Solve number & practical problems. • Find factors of two-digit numbers. • Find some common multiples eg for 4 and 5 • Solve simple problems involving ratio & direct proportion.

Adding & Subtracting	Foundation	Year 1	Year 2	Year 3
Complexity	<ul style="list-style-type: none"> Using quantities and objects, add and subtract two single-digit numbers and count on or back to find the answer. 	<ul style="list-style-type: none"> Understand addition as counting on and combining two sets; record related addition sentences. Understand subtraction as counting back and 'take away'; record related subtraction sentences. Understand difference as 'how many more to make?' Relate counting on & back in tens to finding 10 more/less than a number (<100). Understand that changing the order of addition does not change the total. Recognise the use of a sign such as \square to represent an unknown eg $6 + \square = 10$. Begin to add single & two-digit numbers. 	<ul style="list-style-type: none"> Solve one-step problems with addition & subtraction. Using concrete objects & pictorial representations, including those involving numbers, quantities & measures. Use the addition, subtraction and = signs. Relate counting on/back in tens to finding 10 more/less than any two-digit number & then to adding & subtracting other multiples of 10 eg 75-30. 	<ul style="list-style-type: none"> Recognise two and three-digit multiples of 2,5 and 10.
Methods		<ul style="list-style-type: none"> Find two more or less than a number to 20, recording the jumps on a number line. Add/subtract a single-digit number by counting on/back. Begin to use the +, - and = signs to record calculations in number sentences. Add a pair of numbers by putting the larger number first & counting on. 	<ul style="list-style-type: none"> Add & subtract numbers using concrete objects, pictorial representations & mentally, including: <ul style="list-style-type: none"> One-digit & two-digit numbers to 20, inc zero; A two-digit number & ones. A two-digit number & tens. Two two-digit numbers. Adding three one-digit numbers. (Add 4 or 5 small numbers) Show that addition of two numbers can be done in any order and subtraction of one number from another, cannot. Use the = sign to represent equality eg $16+4=17+3$. Recognise the use of a symbol such as \square to represent an unknown (as stage 1) 	<ul style="list-style-type: none"> Add & subtract 10 & multiples of 10 to and from two and three digit numbers. Add 100 & multiples of 100 to three-digit numbers. Use the = sign to represent equality eg $75+25=95+5$. Add several small numbers. Find complements to 100, solving number equations such as $78 + \square = 100$. Add & subtract pairs of two-digit numbers. Add three-digit & two-digit numbers, using notes to support. Re-order an addition to help with the calculation eg $41+54$, by adding 40 to 54 then 1. Add/subtract single-digit numbers to/from three-digit numbers. Find 20,30,...90, 100, 200, 300 more/less than three-digit numbers.
Checking		<ul style="list-style-type: none"> Check the answer to an addition by adding the numbers in a different order. Check the answer to a subtraction by adding the answer to the smaller number in the question. Make a sensible estimate of a calculation & consider whether an answer is reasonable. 	<ul style="list-style-type: none"> Recognise & use the inverse relationship between addition & subtraction & use this to check calculations & solve missing number problems. 	<ul style="list-style-type: none"> Check the answer to an addition by adding the numbers in a different order or by using a different strategy eg $35+19$ by adding 20 to 35 and subtracting 1 and by adding $30+10$ and $5+9$. Check a subtraction by adding the answer to the smaller number in the original subtraction. Make a sensible estimate for the answer to a calculation. Consider whether an answer is reasonable.
Using number facts		<ul style="list-style-type: none"> Know all number pairs to 10 & record the related addition/subtraction facts. 	<ul style="list-style-type: none"> Represent & use number bonds & related subtraction facts within 20. 	<ul style="list-style-type: none"> Know addition & subtraction facts for all numbers to 20.

	<ul style="list-style-type: none"> • Begin to know number pairs to 6,7,8,9 and 10. • Add more than two small numbers, spotting pairs to 10, eg $4+3+6 = 10+3$. • Begin using pairs to 10 to bridge 10 when adding/subtracting eg $8+3$, add 2 then 1. 	<ul style="list-style-type: none"> • Recall & use addition & subtraction facts to 20 fluently, & derive & use related facts up to 100. • Find all pairs of multiples of 10 with a total of 100 & record the related addition & subtraction facts. 	<ul style="list-style-type: none"> • Know multiples of 100 with a total of 1000 • Know multiples of 5 with a total of 100. •
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Adding & Subtracting	Year 4	Year 5	Year 6
Complexity	<ul style="list-style-type: none"> • Solve two-step addition & subtraction problems in contexts, deciding which operations & methods to use & why. 	<ul style="list-style-type: none"> • Use appropriate strategies to add or subtract pairs of two- and three-digit numbers & numbers with one decimal place, using jotting where necessary. 	<ul style="list-style-type: none"> • Solve multi-step addition & subtraction problems in contexts, deciding which operations & methods to use & why.
Methods	<ul style="list-style-type: none"> • Add & subtract numbers with up to 4 digits using the formal written methods of column addition & subtraction where appropriate. • Add & subtract numbers mentally, including: <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 three two-digit multiples of 10 eg $40+70+50$. • Add and subtract near multiples of 10 or 100 to or from three-digit numbers eg $367-198$ or $278+49$. • Find a difference between near multiples of 100 eg $304-296$. • Subtract a small number crossing 100 eg $304-8$ • Add pairs of three-digit numbers. • Subtract a two-digit number from a three-digit number. • Subtract pairs of three-digit numbers. 	<ul style="list-style-type: none"> • Find the total of more than three two or three-digit numbers using a written method. • Add or subtract any pair of three and/or four-digit numbers, with the same number of decimal places, including amounts of money. • Add or subtract near multiples of 10 or 100 eg $4387-299$. • Calculate differences between near multiples of 1000 eg $5026-4998$ or near multiples of 1 eg $3.2-2.6$. 	<ul style="list-style-type: none"> • Add & subtract whole numbers with more than 4 digits, inc using formal written methods. • Add & subtract numbers mentally with increasingly large numbers. • Derive quickly pairs of one-place decimals totalling 1 eg $0.78 + 0.22$. • Use place value & number facts to add or subtract two-digit whole numbers & to add or subtract three-digit multiples of 10 & pairs of decimals. • Add/subtract near multiples of one when adding numbers with one decimal place eg $5.6+2.9$. • Add/subtract a near multiple of 10, 100 or 1000 or a near whole unit of money and adjust eg $3127+4998$. • Find the difference between a positive & negative integer.
Checking	<ul style="list-style-type: none"> • Estimate & use inverse operations to check answers to a calculation. 	<ul style="list-style-type: none"> • Estimate & use inverse operations to check answers to a calculation. 	<ul style="list-style-type: none"> • Use rounding to check answers to calculations & determine, in the context of a problem, levels of accuracy.
Using number facts	<ul style="list-style-type: none"> • Solve problems, inc missing number problems, using number facts, place value & more complex addition & subtraction. 	<ul style="list-style-type: none"> • Know by heart pairs of one-place decimals with a total of 1 eg $0.8+0.2$ • Derive quickly pairs of decimals with a total of 10 and with a total of 1. • 	<ul style="list-style-type: none"> • Add & subtract negative integers. • Recall addition & subtraction facts for numbers to 20 & pairs of one-place decimals with a total of 1 eg $0.4+0.6$.

Multiplication & Division	Foundation	Year 1	Year 2	Year 3
Complexity	<ul style="list-style-type: none"> Solve problems, including doubling, halving and sharing. 	<ul style="list-style-type: none"> Double any single-digit number. Find halves of even numbers of objects up to 10. Try to share numbers to 10 to find which are even & which are odd. Share objects into two equal groups in a context. 	<ul style="list-style-type: none"> Solve one-step problems involving multiplication & division by calculating the answer using concrete objects, pictorial representations & arrays with the support of the teacher. Use different coins to make the same amount. 	<ul style="list-style-type: none"> Recognise two and three-digit multiples of 2, 5 and 10. Understand the relationship between halving & doubling. Understand the effect of multiplying two-digit numbers by 10. Understand that division can leave a remainder (initially as some left over). Understand the relationship between multiplication & division & write connected facts.
Methods			<ul style="list-style-type: none"> Calculate mathematical statements for multiplication & division within the multiplication tables & write them using the multiplication, division and equals signs. Show that multiplication of two numbers can be done in any order and division of one number by another cannot. Solve problems involving multiplication & division using mental methods. 	<ul style="list-style-type: none"> Work out quickly the doubles of multiples of 5 (<100) and derive the related halves. Work out quickly the doubles of multiples of 50 to 500. Multiply single-digit numbers & divide two-digit numbers by 2, 3, 4, 5, 6, 9 and 10. Multiply teens numbers by 3 and 5. Begin to divide two-digit numbers just beyond 10x tables, eg 60 divided by 5, 33 divided by 3.
Checking		<ul style="list-style-type: none"> Check multiplication by addition. (<i>only repeated addition</i>) 	<ul style="list-style-type: none"> Use known multiplication facts to check the accuracy of calculations. 	<ul style="list-style-type: none">
Using number facts		<ul style="list-style-type: none"> Know doubles to at least double 5. Find near doubles, using doubles already known eg 5+6. Begin to recognise multiples of 2 & 10. 	<ul style="list-style-type: none"> Recall & use multiplication & division facts for the 2, 5 and 10 multiplication tables. Use multiplication & division facts to solve problems. Find & learn doubles for all numbers up to 10 and also 15, 20, 25 and 50. 	<ul style="list-style-type: none"> Know multiplication/division facts for 2x, 3x, 5x & 10x tables. Begin to know 4x table.

Multiplication & Division	Year 4	Year 5	Year 6
Complexity	<ul style="list-style-type: none"> Solve problems involving multiplying & adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems & harder correspondence problems. Begin to understand simple ideas of ratio & proportion eg a picture is one fifth the size of the real dog. It is 25cm long in the picture so it is 5x25cm long in real life. Decide whether to round up or down after division to given an answer to a problem. 	<ul style="list-style-type: none"> Decide whether to round an answer up or down after division, depending on the context. 	<ul style="list-style-type: none"> Solve problems involving addition, subtraction, multiplication & division & a combination of these, inc understanding the meaning of the equals sign. Solve problems involving multiplication & division, inc scaling by simple fractions & problems involving simple rates. Use knowledge of the order of operations to carry out calculations involving the four operations.
Methods	<ul style="list-style-type: none"> Multiply two-digit & three-digit numbers by a one-digit number using formal written layout. Use place value, known & derived facts to multiply & divide mentally, including: multiplying by 0 & 1; dividing by 1; multiplying together three numbers. Recognise & use factor pairs & commutativity in mental calculations. Understand the effect of multiplying & dividing three-digit numbers by 10. Derive quickly doubles of all whole numbers to 50, doubles of multiples of 10 to 500, doubles of multiples of 100 to 5000 and corresponding halves. Multiply any pair of single-digit numbers together. Double any two-digit number. Divide two-digit numbers by single digit-numbers (answers no greater than 20). 	<ul style="list-style-type: none"> Find factors of two-digit numbers. Multiply multiples of 10 to 90 & multiples of 100 to 900 by a single-digit number. Multiply by 19 or 21 by multiplying by 20 & adjusting. Multiply by 25 by multiplying by 100 & dividing by 4. Use factors to multiply eg multiply by 3, then double to multiply by 6. Double any number up to 100 & halve even numbers to 200 & use this to double and halve numbers with one or two decimal places eg double 3.4 and half of 8.6. Double multiples of 10 to 1000 & multiples of 100 to 10,000, eg double 360 or double 3600 & derive the corresponding halves. Multiply or divide three-digit numbers by single-digit numbers. Multiply two-digit numbers by two-digit numbers. Multiply two-digit numbers with one decimal place by single-digit numbers eg 3.6x7. Divide three-digit numbers by single-digit numbers including those with a remainder. Begin to express remainders as a fraction of the divisor when dividing two-digit numbers by single-digit numbers. Decide whether to group or to share to solve divisions. Begin to use brackets to order operations & understand the relationship between the four operations & how the laws of arithmetic apply to multiplication. 	<ul style="list-style-type: none"> Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. Divide numbers up to 4 digits by a two-digit whole number using remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. 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. Perform mental calculations, inc with mixed operations & large numbers. Know & apply tests of divisibility by 2,4,5,10,25 and 100. Use place value & multiplication facts to multiply/divide mentally eg 0.8 x 7; 4.8 x 6. Multiply pairs of multiples of 10 eg 30 x 40 or multiples of 10 and 100 eg 600 x 40. Double quickly any two-digit number eg 78, 7.8, 0.78 and derive the corresponding halves. Divide two-digit numbers by single-digit numbers, including leaving a remainder. Multiply near multiples of 10 by multiplying by the multiple of 10 and adjusting. Multiply by halving one number and doubling the other eg calculate 35x16 with 70 x 8. Use number facts to generate new multiplication facts eg the 17x table from 10x + 7 x tables.
Checking	<ul style="list-style-type: none"> Recognise & use the inverse relationship between multiplication & division & use this to check calculations & solve missing number problems. 	<ul style="list-style-type: none"> Recognise & use the inverse relationship between multiplication & division & use this to check calculations & solve missing number problems. 	<ul style="list-style-type: none"> Estimate & use inverse operations & rounding to check answers to a calculation.

Using number facts	<ul style="list-style-type: none"> Recall multiplication & division facts for multiplication tables up to 12 x 12. 	<ul style="list-style-type: none"> Know multiplication & division facts for the 2x to 10x tables. Know & apply tests of divisibility by 2,5,10 and 100. Recognise multiples of 6,7,8,9 up the 10th multiple. Know squares of all numbers to 10x10. 	<ul style="list-style-type: none"> Identify common factors, common multiples & prime numbers. Establish whether a number up to 100 is prime & recall prime numbers up to 19. Multiply & divide whole numbers & those involving decimals by 10, 100 & 1000. Recognise & use square numbers & cube numbers, & the notation for square (2) and cubed (3). Solve problems involving multiplication & division inc using knowledge of factors & multiples, squares & cubes.
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Fractions (inc decimals, percentages, ratio & proportion)	Foundation	Year 1	Year 2	Year 3
Recognising fractions	<ul style="list-style-type: none"> Solve problems, including doubling, halving and sharing. 	<ul style="list-style-type: none"> Find halves of small numbers and shapes by folding and recognise which shapes are halved. 	<ul style="list-style-type: none"> Recognise, find & name a half as one of two equal parts of an object, shape or quantity Recognise, find & name a quarter as one of four equal parts of an object, shape or quantity Recognise, find, name & write fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects of quantity. 	<ul style="list-style-type: none"> Understand & use fraction notation, recognising that fractions are several parts of one whole. Recognise simple mixed fractions eg $1\frac{1}{2}$ and $2\frac{1}{4}$ Begin to relate finding fractions to division.
Equivalence			<ul style="list-style-type: none"> Recognise the equivalence of $\frac{2}{4}$ & $\frac{1}{2}$. Recognise simple equivalent fractions. 	<ul style="list-style-type: none"> Recognise equivalence between simple fractions.
Solving problems			<ul style="list-style-type: none"> Write simple fractions eg $\frac{1}{2}$ of 6=3. 	<ul style="list-style-type: none"> Find halves, thirds, quarters & tenths of shapes and numbers (whole number answers).

Fractions (inc decimals, percentages, ratio & proportion)	Year 4	Year 5	Year 6
Recognising fractions	<ul style="list-style-type: none"> Recognise, find & write fractions of a discrete set of objects: unit fractions & non-unit fractions with small denominators. Recognise & use fractions as numbers: unit fractions & non-unit fractions with small denominators. Round decimals with one decimal place to the nearest whole number. Compare numbers with the same number of decimal places up to 2 decimal places. Count up & down in tenths; recognise that tenths arise from dividing an object into 10 equal parts & in dividing one-digit numbers of quantities by 10. Count up & down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. Compare & order unit fractions & fractions with the same denominators. Recognise mixed numbers eg $5\frac{3}{4}$ & order these on a number line. Relate finding fractions to division. Find halves, quarters, thirds, fifths, eighths & tenths of shapes & numbers. 	<ul style="list-style-type: none"> Change an improper fraction to a mixed number eg $\frac{7}{4}$ to $1\frac{3}{4}$; order mixed numbers & place between whole numbers on a number line. Relate finding fractions to division & use to find simple fractions of quantities. Understand percentage as the number of parts in every 100 & find simple percentages of quantities. Express halves, tenths & hundredths as percentages. Use fractions to describe & estimate a simple proportion, eg $\frac{1}{5}$ of the beads are yellow. Use ratio to solve problems eg to adapt a recipe for 6 people to one for 3 or 12 people. 	<ul style="list-style-type: none"> Compare & order fractions whose denominators are all multiples of the same number. Compare & order fractions, including fractions >1. Recognise mixed numbers & improper fractions & convert from one form to the other & write mathematical statements >1 as a mixed number. Round decimals with two decimal places to the nearest whole number & to one decimal place. Read, write, order & compare numbers with up to three decimal places. Identify the value of each digit in numbers given to three decimal places. Solve problems involving number up to three decimal places. Compare fractions with the same denominator & related denominators eg $\frac{3}{4}$ with $\frac{7}{8}$. Order mixed numbers & place between whole numbers on a number line. Change an improper fraction to a mixed number eg $\frac{17}{8}$ to $2\frac{1}{8}$. Reduce fractions to their simplest form, where this is $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ or a number of fifths or tenths. Begin to convert a vulgar fraction to a decimal fraction using division. Understand percentage as parts in every 100 and express $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{10}$, $\frac{1}{100}$ as percentages. Find simple percentages of shapes & whole numbers.
Equivalence	<ul style="list-style-type: none"> Recognise & show, using diagrams, families of common equivalent fractions. Recognise & write decimal equivalents of any number of tenths or hundredths. Recognise & write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$. Recognise equivalence between more complex fractions and <u>be able to order them</u>. Understand the equivalence between one-place decimals & fractions in tenths. Understand that $\frac{1}{2}$ is equivalent to 0.5 and also to $\frac{5}{10}$. Recognise the equivalence between the decimal fraction & vulgar forms of halves, quarters, tenths & hundredths. 	<ul style="list-style-type: none"> Recognise equivalence between fractions. Recognise equivalence between the decimal & fraction forms of halves, tenths & hundredths & use this to help order fractions eg 0.6 is more than 50% and less than $\frac{7}{10}$. 	<ul style="list-style-type: none"> Identify, name & write equivalent fractions of a given fraction, represented visually, including tenths & hundredths. Read & write decimal numbers as fractions. Recognise & use thousandths & relate them to tenths, hundredths & decimal equivalents. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Associate a fraction with division & calculate decimal fraction equivalents.

			<ul style="list-style-type: none"> Recall & use equivalences between simple fractions, decimals & percentages, including in different contexts. Recognise equivalence between fractions eg between $\frac{1}{100}$s, $\frac{1}{10}$s and $\frac{1}{2}$s. Recognise & use the equivalence between decimal & fraction forms.
Solving problems	<ul style="list-style-type: none"> Add & subtract fractions with the same denominator within one whole. Solve problems involving increasingly harder fractions. Calculate quantities & fractions to divide quantities (including non-unit fractions where the answer is a whole number). Add & subtract fractions with the same denominator. 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 & hundredths. Solve simple measure & money problems involving fractions & decimals to two decimal places. 		<ul style="list-style-type: none"> Add & subtract fractions with the same denominator & denominators that are multiples of the same number. Add & subtract fractions with different denominators & mixed numbers, using the concept of equivalent fractions. Multiply proper fractions & mixed numbers by whole numbers, supported by materials & diagrams. Multiply simple pairs of proper fractions, writing the answer in its simplest form. Solve problems which require knowing percentage & 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. Divide proper fractions by whole numbers. Multiply & divide numbers by 10, 100 & 1000 giving answers up to three decimal places. <p>Ratio & Proportion</p> <ul style="list-style-type: none"> Solve problems involving the relative size of two quantities where missing values can be found by using integer multiplication & division facts. Solve problems involving the calculation of percentages & the use of percentages for comparison. Solve problems involving similar shapes where the scale factor is known or can be found. Solve problems involving unequal sharing & grouping using knowledge of fractions & multiples.

Space, Shape & Measure - Chris Quigley -National Curriculum	Foundation	Year 1	Year 2	Year 3	(Year 4)
Shape		<ul style="list-style-type: none"> Recognise and name common 2D and 3D shapes. 	<ul style="list-style-type: none"> Identify and describe the properties of 2D shapes, including, sides and lines of symmetry. Identify and describe the properties of 3D shapes, including faces, vertices and faces. Identify 2D shapes on the surface of 3D shapes. Compare and sort 2D and 3D shapes and everyday objects. 	<ul style="list-style-type: none"> Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. Recognise angles as a property of shape or a description of a turn Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	<ul style="list-style-type: none"> Compare and classify geometric shapes, including different triangle. Identify lines of symmetry in 2D shapes presented in different locations. Complete a simple symmetric figure with respect to a specific line of symmetry. Identify acute and obtuse and compare and order angles up to two right angles by size.
Position, direction and movement.		<ul style="list-style-type: none"> Describe position, direction and movement, including whole, half, quarter and three-quarter turns. 	<ul style="list-style-type: none"> Order and arrange combinations of mathematical objects in patterns and sequences. Use mathematical vocab to describe position, direction and movement including straight lines, quarter, and three-quarters (clockwise and anti-clockwise). 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Recognise angles as a property of shape and as an amount of rotation. Identify angles that are greater than a right angle. Describe position on a 2D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to left/ right and up/down. Plot specified point and draw sides to complete a given polygon.
Measure		<ul style="list-style-type: none"> Compare, describe and solve practical problems for: 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] 	<ul style="list-style-type: none"> Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}$C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels Compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$ Recognise and use symbols for pounds (£) and pence (p); combine 	<ul style="list-style-type: none"> Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) Measure the perimeter of simple 2-D shapes Add and subtract amounts of money to give change, using both £ and p in practical contexts Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight Know the number of seconds in a minute and the number of days in each month, year and leap year 	<ul style="list-style-type: none"> Convert between different units of measure [for example, kilometre to metre; hour to minute]. Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Find the area of rectilinear shapes by counting squares. Estimate, compare and calculate different measures, including money in pounds and pence. Read, write and convert time between analogue and digital 12- and 24- hour clocks. Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

		<ul style="list-style-type: none"> Measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) Recognise and know the value of different denominations of coins and notes Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] Recognise and use language relating to dates, including days of the week, weeks, months and years Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. 	<p>amounts to make a particular value</p> <ul style="list-style-type: none"> Find different combinations of coins that equal the same amounts of money Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change Compare and sequence intervals of time Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times Know the number of minutes in an hour and the number of hours in a day. 	<ul style="list-style-type: none"> Compare durations of events [for example to calculate the time taken by particular events or tasks]. 	
Data Handling			<ul style="list-style-type: none"> Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quality. Ask and answer questions about totalling and comparing categorical data. 	<ul style="list-style-type: none"> Interpret and present data using bar charts, pictograms and tables Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. 	<ul style="list-style-type: none"> Interpret and present data using bar charts, pictograms and tables. Solve one-step and two-step questions, for example, how many more? How many fewer? Using information presented in scale bar charts. Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other

					graphs. Solve one-step and two-step questions, for example, how many more? How many fewer? Using information presented in scale bar charts, pictograms and tables.
Algebra			<ul style="list-style-type: none"> Solve addition and subtraction problems involving missing numbers. 	<ul style="list-style-type: none"> Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. 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. 	<ul style="list-style-type: none"> Solve addition, subtraction, multiplication and division problems involving missing numbers.

Space, Shape & Measure	Year 5	Year 6
Shape	<ul style="list-style-type: none"> identify 3-D shapes, including cubes and other cuboids, from 2-D representations know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees (°) identify: <ul style="list-style-type: none"> angles at a point and 1 whole turn (total 360°) angles at a point on a straight line and half a turn (total 180°) other multiples of 90° use the properties of rectangles to deduce related facts and find missing lengths and angles distinguish between regular and irregular polygons based on reasoning about equal sides and angles 	<ul style="list-style-type: none"> draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Position, direction and movement.	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> describe positions on the full coordinate grid (all 4 quadrants) draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Measure	<ul style="list-style-type: none"> convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre] understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres 	<ul style="list-style-type: none"> solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places convert between miles and kilometres recognise that shapes with the same areas can have different perimeters and vice versa

	<ul style="list-style-type: none"> calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] solve problems involving converting between units of time 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"> recognise when it is possible to use formulae for area and volume of shapes calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]
Data Handling	<ul style="list-style-type: none"> solve comparison, sum and difference problems using information presented in a line graph complete, read and interpret information in tables, including timetables 	<ul style="list-style-type: none"> interpret and construct pie charts and line graphs and use these to solve problems calculate and interpret the mean as an average
Algebra	<ul style="list-style-type: none"> Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example $13 + 24 = 12 + 25$; $33 = 5 \times ?$). Missing measures questions such as these can be expressed algebraically, for example $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm. 	<ul style="list-style-type: none"> use simple formulae generate and describe linear number sequences express missing number problems algebraically find pairs of numbers that satisfy an equation with 2 unknowns enumerate possibilities of combinations of 2 variables