Calculation Policy 2019



Bishop Road Primary School

<u>Rationale</u>

Children are introduced to the processes of calculation through practical, oral and mental activities. As children begin to understand the underlying ideas they develop ways of recording to support their thinking and calculation methods, use particular methods that apply to special cases, and learn to interpret and use the signs and signals involved. Over time children learn how to use models and images, such as number lines to support mental math calculations. For those calculations that cannot be easily completed mentally, written methods need to be deployed which become more efficient and succinct as the children move through the school. By the end of Year 5, children are equipped with mental and written methods that children understand and can use confidently and check their work accurately. By the end of Year 6 the children are able to know which method(s) to deploy within a range of different mathematical scenarios. Whatever stage of learning, all methods need to be underpinned by knowledge of number facts that can be rapidly re-called with accuracy.

The overall aims for children at Bishop Road are that they leave the school being able to:-

- 1. Have a secure knowledge of number facts and at least a good knowledge and understanding of all four number operations.
- 2. Use their knowledge and understanding to carry out calculations mentally and to apply general strategies to different scenarios. 'Use what you know to work out what you don't know'.
- 3. Use efficient, reliable and compact written methods of calculation for each operation that can be applied confidently.
- 4. Check calculations accurately by both repeating the method and 'approximate' checking by thinking 'does it look correct?'

Golden Rules that apply to each operation

- 1. One digit = one square.
- 2. Line up the columns correctly.
- 3. Rewrite incorrect digits. Do not write over the top of an incorrect answer.

- 4. Form digits carefully.
- 5. 'Carried' digits are written smaller and go 'on the door step' or in the case of division 'on the shoulder'.

Year 1 Add with numbers up to 20 Use numbered number lines to add, by counting on in ones, 7 encouraging children to begin with larger number and count on. 6+3=9Children should: have access to a range of equipment e.g. number lines, counting apparatus, 100 squares, bead strings etc. be shown numbers in a range of contexts read and write number sentences using the + and = signs • interpret number sentences including missing number problems e.g 3 + [] = 8 Bead strings or bead bars can be used to illustrate addition including bridging throug ten by counting on 2 then counting on 3. 8 + 5

Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line

- Read and write numbers to 100 in numerals (1 20 in words)
- Count to, back and across 100
- Recall bonds to 10 and 20, and addition facts within 20 ('story of' 5, 67, 8, 9 and 10)
- Count on in ones from a given 2-digit number
- Add two single-digit numbers by counting on
- Add three single-digit numbers spotting doubles or pairs to 10
- Count on in tens from any given 2-digit number
- Add 10 to any given 2-digit number
- Use number facts to add single-digit numbers to two-digit numbers, e.g. use 4 + 3 to work out 24 +3, 34 + 3...
- Add by putting the larger number first
- Recognise doubles to double 6

Year 2 Add numbers with 2-digits. Develop mental fluency with place value and addition using 2-digit numbers, then move to formal 7 methods Add 2-digit numbers and tens, 2-digits and units, two 2-digit numbers, first practically using equipment (Dienes Base 10, MultiLink, 100 Squares) then using: Add 2-digit numbers and units: Add 2-digit numbers and tens: Use empty number lines, 16 + 727 + 30+3 concrete equipment, hundred +10 +10 +10 squares etc. to build confidence and fluency in 37 47 16 20 23 mental addition skills 57 Children move to more 25 + 47 formal recording using 20 + 540 + 7partitioning method, setting 20 + 40 = 60out as follows: 5+7 =12 This needs to be modelled using Dienes apparatus.

Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary

- Locate any 2-digit number on a landmarked line and use this to compare numbers; record comparisons < and >, e.g. 56 > 39.
- Identify any number on the 1 -100 number grid; understand that each number is a multiple of ten and some ones, e.g. 54 is 50 and 4 more.
- Add two single digit numbers (8+7) by counting up; add 2-digit numbers which total less than 100 by counting on in tens and ones, e.g. 54 + 37 as 54 + 30 + 7.
- Know securely number pairs for all the numbers up to and including 12
- Count in steps of 2, 5 and 10 from 0.
- Know different unit patterns when not crossing a ten, e.g. 4 + 3 = 7, 14 + 3 = 17, 24 + 3 = 27
- Begin to recognise unit patterns when crossing a ten, e.g. 5 + 6 = 11
- Know pairs with a total of 20 and multiples of 10 and 100
- Count on in ones and tens from any given 2-digit number
- Add two or three single-digit numbers
- Add a single-digit number to any 2-digit number using number facts, including bridging multiples of 10. Add 10 and small multiples of 10 to any given 2-digit number
- Add any pair of 2-digit numbers
- Know that adding can be done in any order
- Solve problems with addition using concrete objects, pictorial representations, involving numbers, quantities and measures, applying written and mental methods



Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, increase, vertical, 'carry', expanded, compact

- Know pairs which total 20.
- Know pairs of multiples of 10 with a total of 100.
- Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning.
- Add multiples and near multiples of 10 and 100.
- Add 1,10 or 100 to 3-digit numbers.
- Understand place value in 3-digit numbers.
- Perform place value additions without a struggle. (E.g. 300 + 8 + 50 = 358)
- Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number. (E.g. 104
- + 56 is 160 since 104+50=154 and 6+4=10 and 676 + 8 is 684 since 8=4+4 and 76+4+4=84)
- Add pairs of 'friendly' 3-digit numbers mentally e.g. 320 + 450
- Begin to add amounts of money using partitioning.
- Solve problems with addition using number facts, place value or missing numbers.

7

Year 4 Add numbers with up to 4 digits

Continue to use the compact column method, adding units first and carrying underneath the calculation. Also include money and measures contexts.



Children use and apply this method to money and measures.

Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse

- Select appropriate method (mental, jottings, written) and explain why.
- Add any two 2-digit numbers by partitioning or counting on.
- Know by heart/quickly derive number bonds to 100 (eg 32 + 68) and to £1 (64p + 36p)
- Add to the next hundred, pound and whole number. (E.g. 234 + 66 = 300, 3.4 + 0.6 = 4)
- Perform place value additions without a struggle. (E.g. 300 + 8 + 50 + 4000 = 4358)
- Add multiples and near multiples of 10, 100 and 1000.
- Add £1, 10p, 1p to amounts of money.
- Use place value and number facts to add 1-, 2-, 3-and 4-digit numbers where a mental calculation is appropriate'. (E.g. 4004 + 156 by knowing that 6+4=10 and that 4004+150= 4154 so total is 4160)
- Perform inverse operations to check answers.
- Solve 2-step problems in context.
- Continue to practise a wide range of mental addition strategies.

Year 5 Add numbers with more than 4 digits

including money, measure and decimals with different numbers of decimal places.



Use column addition to add two or three whole numbers.

Use column addition to add any pair of two-place decimal numbers including amounts of money.

Say 6 tenths and 7 tenths to reinforce place value.



Empty decimal places can be filled with a zero to show the place value of each column.

Children should:

Understand the place value of tenths and hundredths and use this to align numbers with differing numbers of decimal places.

Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths.

Key Skills for addition at Year 5

- Locate 5 and 6 digit numbers on a landmarked line; use this to compare/order numbers.
- Round to a ten, a hundred, a thousand or a ten thousand.
- Use rounding to check accuracy.
- Understand a one-place decimal number as a number of tenths and a two-place decimal number as a number of hundredths.

• Add or subtract 0.1 or 0.01 to/from any decimal number with confidence, e.g. 5.83 + 0.01 or 4.83 - 0.1.

• Add and subtract mentally with confidence where the numbers are less than 100 or the calculation relies upon simple addition and place value.

• Confidently add numbers with more than 4-digits using a secure written method, including adding 'piles' of numbers.

• Use inverse calculations to check answers.

Year 6 Add several numbers of increasing complexity



2

Tenths, hundredths and thousandths should be correctly aligned, with the decimal point

aligned vertically, including in the answer.

Empty decimal places can be filled with zeros to show the place value of each column.

Pupils should apply their knowledge of a range of mental strategies, mental recall skills, informal and formal written methods when selecting the appropriate method to work out addition problems. Opportunities to discuss the appropriateness of methods need to be planned for.

Use compact column method to add in context of money and measures. including decimal numbers with different amounts of decimal places.



Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths.

Key Skills for addition at Year 6

• Add mentally with confidence using larger numbers and calculations of increasing complexity.

- Add several large numbers using written addition.
- Add several large or decimal numbers using written addition.
- Perform mental calculations, including with mixed operations and large numbers, using a range of strategies.
- Solve multi-step problems.
- Use estimation and inverse calculations to check the validity of an answer.

SUBTRACTION

Year 1 Subtract from numbers up to 20

Children consolidate understanding of subtraction practically using bead strings, cubes etc. and in real life contexts. They are introduced to more formal recording using number lines, then using empty lines.



Model subtraction practically and using number lines and 100 squares.

Find the difference between - this is to be done practically using the language 'find the difference between' and 'how many more than?'

This will be introduced practically with the	7	'Seven is 3 more than four'
language 'find 1	4	
distance between and	· · · ·	'T am 2 years older than my
now many more? in a		2 and 2 years order manning

Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is...

Key Skills for subtraction at Year 1

- Give a number, say one less
- Count back in ones to and from 100 and from any single-digit or 2-digit number.
- Count back in tens from an 2-digit number
- Locate any number on a 1-100 grid or a beaded line 0-100
- Know number bonds to 10, also know what is left if objects are taken from 10, e.g. 10 fingers, fold down 4, leaves 6 standing.
- Solve one-step problems involving subtraction, using concrete objects (bead strings, objects, cubes) and pictures, and missing number problems.
- Recognise the and = signs, and use these to read and write simple subtractions.

Year 2 Subtract with 2-digit numbers

Use practical equipment such as Dienes to model subtraction

Subtract first on a number line, then on an empty number line, by counting back, aiming to develop mental subtraction skills.



Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is..., difference, count on, strategy, partition, tens units

Key Skills for subtraction at Year 2

- Recognise the addition and subtraction are inverse operations and understand that 10 4
- = 6 as well as 6 + 4 = 10.

SUBTRACTION

- Count back in ones or tens to take away, e.g. 27 3 = or 54 20 =.
- Begin to count up to find a difference between two numbers with a small gap (42 38). Know when to count on and when to count back.
- Recall and use subtraction facts to 20 fluently.
- And derive and use related facts to 100.
- Subtract using concrete objects, pictorial representations, 100 squares, Dienes and mentally, including 2-digit number and ones, a 2-digit number and tens, and two 2-digit numbers.
- Use inverse to check calculations.



Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is..., difference, count on, strategy, partition, tens units, take, exchange, digit, value, hundreds

Key Skills for subtraction at Year 3

• Understand place value in 3-digit numbers; add and subtract 1s, 10s or 100s without difficulty; use this to add and subtract multiples of 1, 10, 100 to/from 3-digit numbers.

• Mentally subtract any pair of 2 digit numbers, e.g. 75 - 58

• Recognise that there are two ways of completing subtractions using an empty number line: either by counting up or by counting back.

• Subtract mentally using place value and number bonds eg. 347-5, 347-40, 347-100).



Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is..., difference, count on, strategy, partition, tens units, take and make, exchange, digit, value, hundreds, inverse

Key Skills for subtraction at Year 4

- Mentally subtract any pair of two digit numbers.
- Subtract 3 digit numbers from 3 digit numbers using column subtraction.
- Practise mental subtraction strategies, eg. Round and adjust (37—9), using place value.

• Use counting on in the context of money and also when subtracting from numbers ending in zeros eg 4000-372

• Count backwards through zero, using negative numbers.



<u>Key vocabulary</u> equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is..., difference, count on, strategy, partition, tens units, take and make, exchange, digit, value, hundreds, inverse, tenths, hundredths, decimal point, decimal

Key Skills for subtraction at Year 5

[] Count backwards through zero, using negative numbers.

 $\hfill Add$ or subtract 0.1 or 0.01 to/from any decimal number with confidence, e.g. 5.83 + 0.01 or 4.83 - 0.1

Children need to utilise and consider a range of subtraction strategies, jottings and written methods before choosing how to calculate.

- Subtract larger numbers using column subtraction or by counting up.
- Begin to subtract decimal numbers using counting up: 6.2 3.5
- Decide which mental methods to use and explain why.

SUBTRACTION

Year 6 Subtracting with increasingly large and more complex numbers and decimal values.

including money, measure and decimals with different numbers of decimal places.

8

3



·V 10

6

Empty decimal places can be

filled with zero to show the

place value of each column.

Use the compact column method to subtract more complex integers.

Use the compact column method to subtract in the context of money and measures, including decimal numbers with different numbers of decimal places.

Pupils should apply their knowledge of a range of mental strategies, mental recall skills, informal and formal written methods when selecting the **appropriate method** to work out subtraction problems. Opportunities to discuss the appropriateness of methods need to be planned for.

Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is..., difference, count on, strategy, partition, tens, units, exchange, digit, value, hundreds, inverse, tenths, hundredths, decimal point, decimal

Key Skills for subtraction at Year 6

• Subtract mentally with confidence where the numbers are less than 100 or where the calculation relies upon simple subtraction and place value. Examples include: 6,723 - 400, 72 - 46, 100 - 64

- Subtract large numbers using column subtraction or counting up, e.g. 1323 758
- Subtract decimal numbers using column subtraction or counting up
- Use negative numbers in context and calculate intervals across zero
- Children need to utilise and consider a range of mental subtraction strategies,
- jottings and written methods before deciding how to calculate
- Decide which methods to use and explain why



Key vocabulary groups of, lots of, times, array, altogether, multiply, count

- Count in multiples of 2, 5 and 10
- Recognise doubles to double 6
- Solve simple one-step problems involving multiplication and division, calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.



Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times...

- Count in steps of 2, 3 and 5 from zero and in 10s from any number
- Know the 2x, 5x and 10x tables and begin to say how many 10s are in 40 or how many 5s are in 30; recognise odd and even answers
- Write and calculate number statements using x and = signs
- Show that multiplication can be done in any order
- Solve a range of problems involving multiplication, using concrete objects, arrays, repeated addition, mental methods and multiplication facts.

Year 3 multiply 2-digit numbers by a single digit number

Key skills prior to learning formal methods:

- Partitioning numbers into tens and units
- Multiplying multiples of ten by a single digit using knowledge of multiplication facts and times tables.

• Recall and work out multiplication facts in the 2, 3, 4, 5, 8 and 10 times tables.

Multiplying by partitioning the 2-digit number:



Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, column method, multiple, product, tens, units, value

Key Skills for multiplication at Year 3

• Understand that multiplication is commutative, e.g. 4×8 is the same as 8×4 .

 \bullet Know the 2x, 3x, 4x, 5x, 8x and 10x times tables. All tables need to be learned to 12th multiple.

- Multiply any 2-digit number by 10 or a single-digit number by 100.
- Understand the effect of multiplying whole numbers by 10 and 100.
- Multiply a 1 digit number by a 2 digit number starting to use the open column method.
- Solve multiplication problems involving missing numbers.

Year 4 Multiply 2 and 3 digits by a 1 or 2 digit

number using the expanded column method.

Use the expanded column method to multiply a 2 or 3 digit number by a 1 digit number.



Children should also know all multiplication facts up to 12×12 by the end of Year 4, including inverse calculation.

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value, inverse

- Multiply 1 and 2 digit numbers by 10, 100 and 1000; to understand place value in decimal numbers to 1dp.
- Know and recite all times tables up to 12 x 12; include multiplying by 0 (e.g. $5 \times 0 = 0, 7 \times 0$
- = 0) or by 1 (e.g. $5 \times 1 = 5$, $\frac{1}{2} \times 1 = \frac{1}{2}$).
- Multiply 1- digit numbers by 2-digit or 3-digit numbers using expanded column method.
- Multiply 2- digit numbers by 2-digit or 3-digit numbers using expanded column method.
- Find doubles to double 100 and beyond, using partitioning.
- Begin to double amounts of money.
- Use doubling as strategy for multiplying by 2, 4, 8.
- Count in multiples of 6, 7, 9, 25 and 1000.



Key vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value, inverse, square, factor, integer, decimal, short/long multiplication, 'carry'

- Know and recite all times tables including division facts.
- Multiply numbers up to 4 digits by 1 or 2 digit numbers using column multiplication.
- \bullet Identify multiples and factors using knowledge of multiplication tables up to 12 \times 12.
- Scale up or down by a factor of 2, 5 or 10.
- Multiply integers and decimals by 10, 100, 1000.
- Recognise and use squares and cubes and their notations.



•Use rounding and place value to make approximations before calculating and use these to check validity of answers.

•Use compact multiplication (see Y5) to multiply numbers with 4 digits by a single digit; to multiply money and measures; to multiply decimals up to 2 decimal places by a single digit.

•Use compact multiplication to multiply numbers with 4 digits by a 2-digit number.

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, compact method, multiple, product, tens, units, value, inverse, square, factor, integer, decimal, 'carry', tenths, hundredths, decimal

- Recall multiplication facts up to 12 x 12
- Use compact multiplication to multiply a 1-digit number by a number with up to 4 digits
- Use compact multiplication to multiply a 2-digit by a number with up to 4 digits
- Use compact multiplication to multiply a 1-digit number by a number with one or two decimal places, including amounts of money.
- Multiply fractions and mixed numbers by whole numbers.
- Multiply fractions by proper fractions.
- Use percentages for comparison and calculate simple percentages.
- Estimate answers using rounding and approximation.

Year 1 Group and share small quantities

Using objects, diagrams and pictorial representations to solve problems involving both grouping and sharing.

Grouping:

Sharing:



Children should solve a division problem within a context.

e.g.3 children share 12 sweets. How many does each child get?

Can they solve this and write a division statement e.g. 12 sweets shared between 3 children gives 3 each.

Pupils should:

- Use lots of practical apparatus, arrays and picture representations
- Be taught to understand the difference between 'grouping' objects (How many groups of 2 can you make?) and 'sharing' (share these sweets between 2 people).
- Be able to count in multiples of 2s, 5s and 10s
- Find half of a group of objects by sharing into 2 equal groups

Key vocabulary share, share equally, one each, two each..., group, equal groups of, lots of, array

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations arrays with the support of the teacher
- Through grouping and sharing small quantities, pupils begin to understand, division and finding simple fractions of objects, numbers and quantities
- They make connections between arrays, number patterns and counting in twos, fives and tens.



Key vocabulary share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over

- Count in steps of 2, 3 and 5 from 0
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the x, and = signs
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.



Key vocabulary share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple

Key Skills for division at Year 3

- Recall and use division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables.
- Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one digit.
- Solve problems, in context and including missing number problems, involving division.
- Pupils develop efficient mental methods, for example using division facts (e.g. using 3

× 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (30 × 2 = 60, so 60 ÷ 3 = 20 and 20 = 60 ÷ 3).

• Pupils develop reliable written methods for division, starting with calculations of 2- digit numbers by 1-digit numbers using an empty number line.

- Halve even numbers up to 50 and multiples of ten to 100.
- \bullet Perform divisions within the tables including those with remainders, e.g. 38 \div 5.



Key vocabulary share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor

Key Skills for division at Year 4

- Use a written method to divide a 2-digit or a 3-digit number by a single-digit number.
- Give remainders as whole numbers.
- Recall multiplication and division facts for all numbers up to 12×12 .
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying and dividing by 10 and 100 and 1.
- Pupils practise to become fluent in the formal written method of short division with exact answers when dividing by a one-digit number.
- \bullet Pupils practise mental methods and extend this to three-digit numbers to derive facts, for example 200 \times 3 = 600 so 600 \div 3 = 200

• Pupils solve two-step problems in contexts, choosing the appropriate operation and working with increasingly harder numbers. This should include correspondence questions such as three cakes shared equally between 10 children.

Year 5 Divide up to 4 digits by a single digit < or = to 12, including answers with remainders. Short division including remainder answers. Please refer to Y4 or Y3 if necessary to ensure children are confident in the steps towards short division.



The answer could be expressed as 663 remainder 5 or 663 and 5/8 or as a decimal.

Once children's understanding of this method is secure they might shorten their dialogue to: "How many 6s in 28?" "4 remainder 4" "How many 6s in 44?" "7 remainder 2" Division should be given in a real life context, including using money and measures, so that pupils know to round the answer up or down. Answers could also be given as remainders, decimals or fractions.

BUT ensure children have a secure understanding of what they are doing and are able to use their knowledge of related facts to either make a rough estimate first or have an idea about whether their final answer is reasonable or not.

Key vocabulary share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor quotient, prime number, prime factors, composite number (non-prime)

- Recall multiplication and division facts for all numbers up to 12 x 12 (as in Y4).
- Multiply and divide numbers mentally, drawing upon known facts.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- Solve problems involving multiplication and division where larger numbers are decomposed into their factors.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Work out whether a number up to 100 is prime, and recall prime numbers to 19.
- 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.
- Use multiplication and division as inverses. Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g. $98 \div 4 = 24 r 2 = 241/2 = 24.5 \approx 25$).

Year 6 Divide 4-digit numbers by single and 2-digit numbers (including decimals).

Short division (for dividing by a single digit)



Children should continue to use short division with remainders.

They need to learn how to express an answer as a remainder, a fraction or as a decimal as in in this example.

Introduce long division for dividing by 2 digits.

Write out your 25 times table up to 6 x 25: 25 50 75 100 125 150 Of course, 25s are fairly easy, but not all	$ \begin{array}{r} 3475 \\ 25 86894 \\ -75 \\ 118 \\ -100 \\ 189 \\ -175 \\ 144 \\ 125 \\ \end{array} $
are fairly easy, but not all numbers are so straightforward!	144 - <u>125</u> 19

Begin by writing out the first 6 numbers of the times table of the divisor (in this case 25). Then see how many 25s fit into the first digit of the divided (the number you are dividing, in this case 86894). This is 0, so move onto how many 25s fit into 86. This is 3, so write the 3 above the dividend and then subtract 75 (our 3x25) from 86 and write the answer, 11, below. Bring the next digit from the divided down (8) and put it next to the 11, making 118, and then repeat the process until you have reached the end of the dividend. If you end up with a remainder, remember that it is part of the answer!

Key vocabulary As previously, & common factor

Key Skills for division at Year 6

 \bullet Recall and use multiplication and division facts for all numbers to 12 \times 12 for more complex calculations.

• 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. Use short division where appropriate.

- Perform mental calculations, including with mixed operations and large numbers.
- Identify common factors, common multiples and prime numbers.
- Solve problems involving all 4 operations.
- Use estimation to check answers to calculations and determine accuracy, in the context of a problem.
- Use written division methods in cases where the answer has up to two decimal places.
- Solve problems which require answers to be rounded to specified degrees of accuracy.