Moreton C.E Primary School

Calculation Policy 2021

This policy was ratified on:	March ‘21
Implemented on:	March ‘21
Review date:	September ‘24
Signed by the Headteacher:	_____
Signed by the Chair of Governors	_____

This document describes the progression in methods of calculation taught at Moreton C.E Primary School and the order in which they are introduced. It has been developed in line with the 2014 National Curriculum, and closely follows the statutory and non-statutory guidance contained in the KS1 and KS2 programmes of study for maths.

The three primary aims of the National Curriculum are to ensure that all pupils become **fluent** in the fundamentals of mathematics, learn to **reason mathematically**, and can **solve problems** by applying their mathematics.

In order to develop pupils' conceptual understanding and ability to reason, they will use a range of concrete (physical) support materials, such as counting objects, bead strings, etc. They will also use a variety of visual representations, e.g. number lines and arrays. Children will learn to perform calculations mentally, or using informal jottings, and also with more formal written methods which will be introduced at the appropriate age.
Fluency will be supported through the learning and recall of relevant number facts (addition, subtraction, multiplication and division), which will be taught and practiced regularly throughout school. In addition, children will learn to use more efficient methods of calculation, including "shortcuts" such as adding 98 to a number by adding 100 and subtracting 2.

Children will have regular opportunities to apply the calculation methods they have learned. They will learn to solve problems involving money, measures and other real-life applications. They will also learn precise mathematical vocabulary so they can communicate effectively with other mathematicians. Our expectation is that children will leave primary school with a "toolkit" of calculation methods from which they can choose the best or most efficient method.

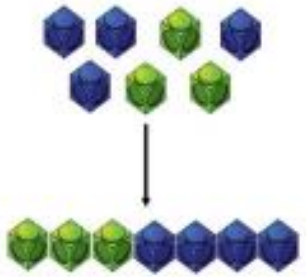
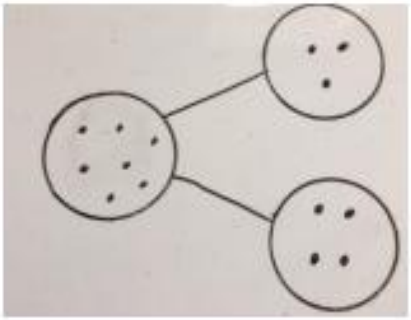
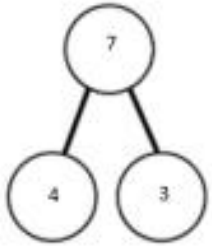
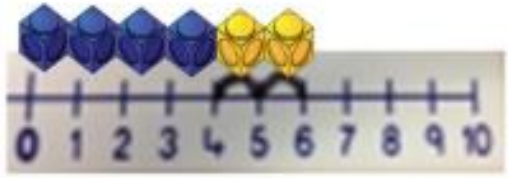
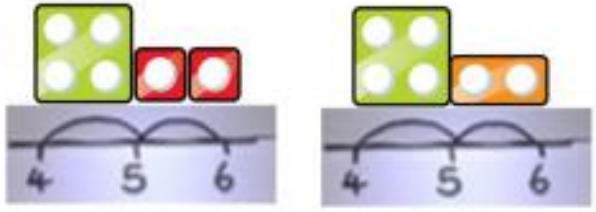
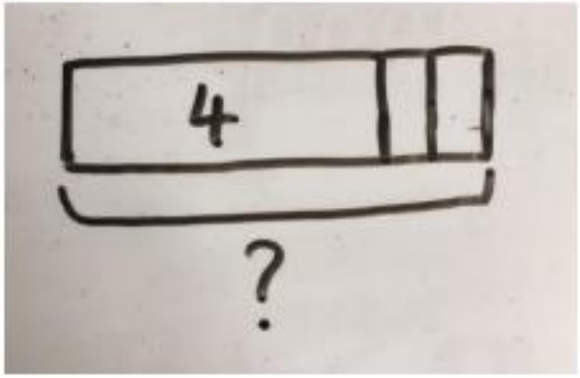
This policy shows the progression children need to move through in order to become efficient mathematicians. It is not split into year groups or key stages, this policy shows the methods used to develop the required skills in order to, ultimately work abstractly with number. It is important that this guidance is used alongside Year Group Expectations to ensure correct content is taught. Do not move into higher year group expectations but if children are working below expected you can use the principles of previous years to help them gain a greater understanding, through the use of concrete resources and taking the concept back a step. Children should move from concrete to pictorial to abstract. In KS2 if children are already competent with abstract (you are sure they fully understand and haven't just learnt a process) there is no need to make them go back to concrete, however it is important that they can use the concrete as these will often be needed in more complex problem solving

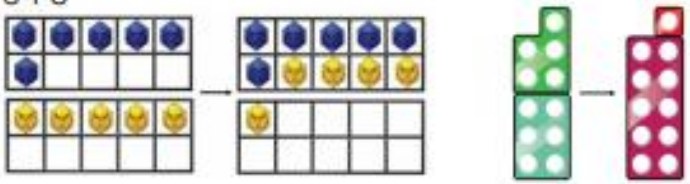
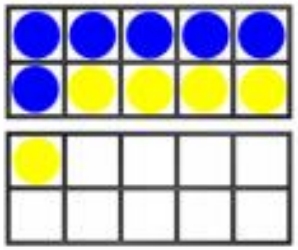
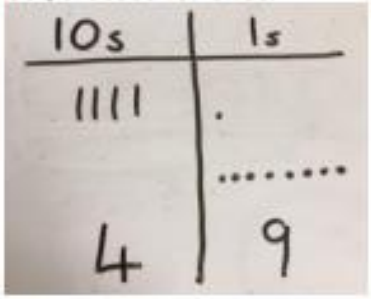
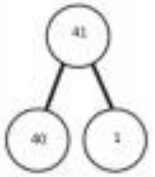
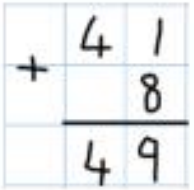
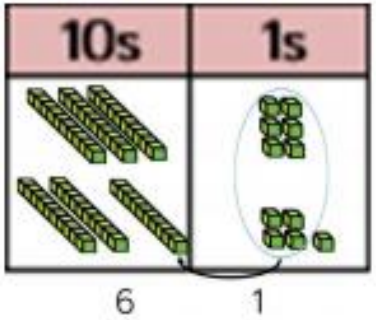
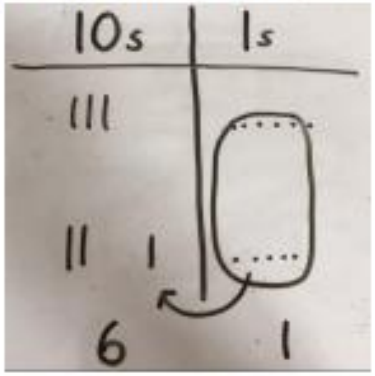
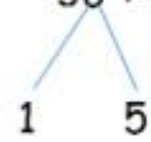
activities. All examples of calculations should be moved onto children finding missing numbers within the calculation

This policy is designed to help teachers and staff members ensure that calculation is taught consistently across the school and to aid them in helping children who may need extra support or challenges.
This policy is also designed to help parents, carers and other family members support children’s learning by letting them know the expectations for their child’s year group and by providing an explanation of the methods used in our school.

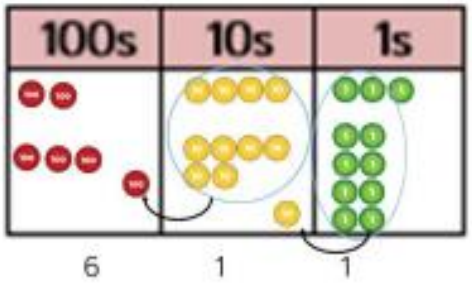
Calculation policy: Addition

Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.

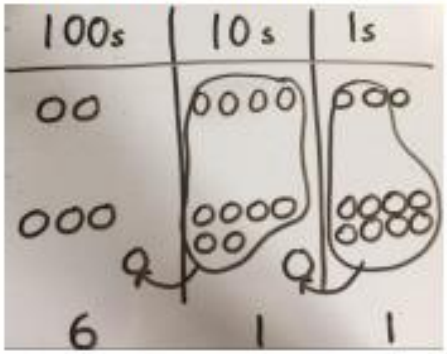
Concrete	Pictorial	Abstract
Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	4 + 3 = 7 Four is a part, 3 is a part and the whole is seven. 
Counting on using number lines using cubes or Numicon.  	A bar model which encourages the children to count on, rather than count all. 	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? 4 + 2 

Regrouping to make 10; using ten frames and counters/cubes or using Numicon. 6 + 5 	Children to draw the ten frame and counters/cubes. 	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
TO + O using base 10. Continue to develop understanding of partitioning and place value. 41 + 8 	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. 	41 + 8  1 + 8 = 9 40 + 9 = 49 
TO + TO using base 10. Continue to develop understanding of partitioning and place value. 36 + 25 	Chidlren to represent the base 10 in a place value chart. 	Looking for ways to make 10. 36 + 25=  30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 36 +25 61 1 Formal method:

Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.

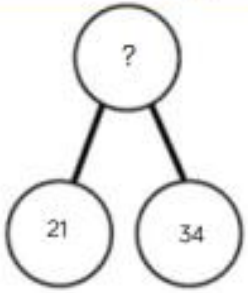


Chidren to represent the counters in a place value chart, circling when they make an exchange.



$$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ \hline 1\ 1 \end{array}$$

Conceptual variation; different ways to ask children to solve 21 + 34



?	
21	34

Word problems:
In year 3, there are 21 children and in year 4, there are 34 children.
How many children in total?

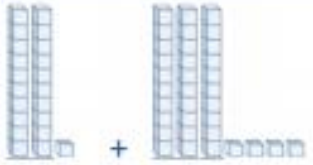
21 + 34 = 55. Prove it

$$\begin{array}{r} 21 \\ +34 \\ \hline \end{array}$$

21 + 34 =

$\square$ = 21 + 34

Calculate the sum of twenty-one and thirty-four.

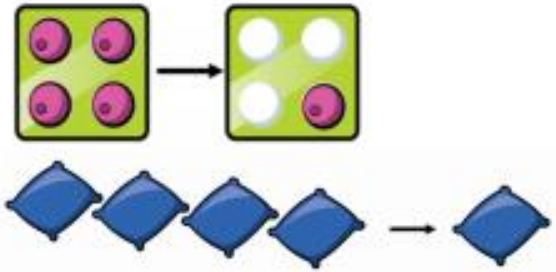
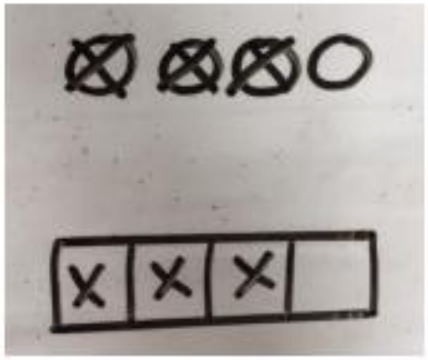
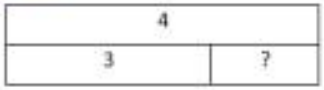
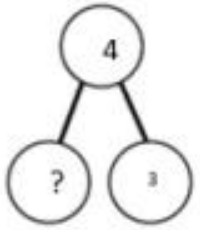
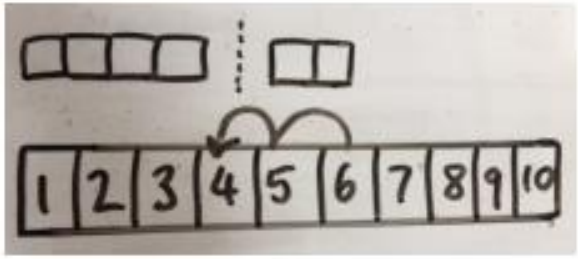
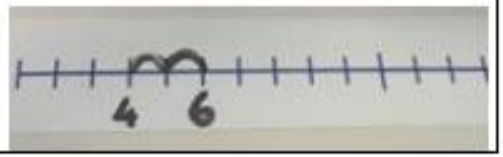


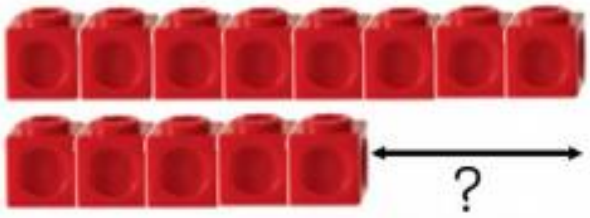
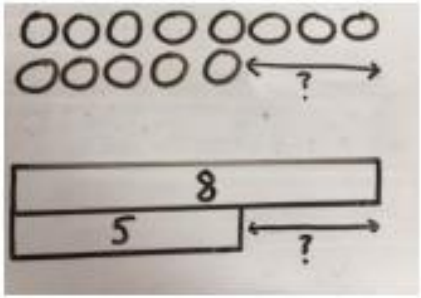
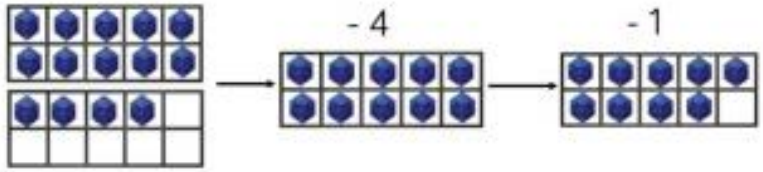
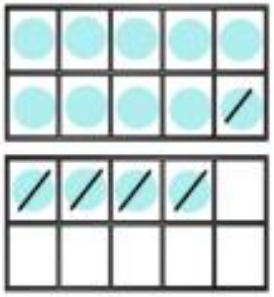
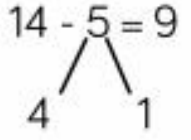
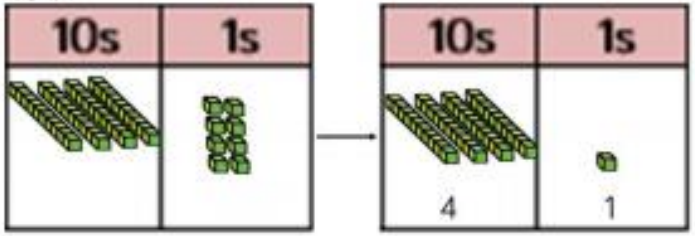
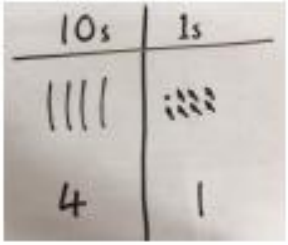
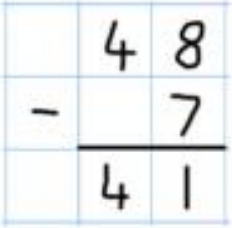
Missing digit problems:

10s	1s
	?
?	5

Calculation policy: Subtraction

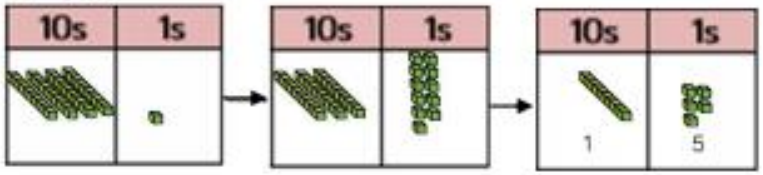
Key language: take away, less than, the difference, subtract, minus, fewer, decrease.

Concrete	Pictorial	Abstract
Physically taking away and removing objects from a whole (ten frames, Numicon, cubes and other items such as beanbags could be used). 4 – 3 = 1 	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. 	**4- 3 =** **□ = 4 – 3**  
Counting back (using number lines or number tracks) children start with 6 and count back 2. 6 – 2 = 4  	Children to represent what they see pictorially e.g.  	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line  

Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5. 	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. 	Find the difference between 8 and 5. 8 – 5, the difference is ☐ Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference.
Making 10 using ten frames. 14 – 5 	Children to present the ten frame pictorially and discuss what they did to make 10. 	Children to show how they can make 10 by partitioning the subtrahend.  14 – 4 = 10 10 – 1 = 9
Column method using base 10. 48-7 	Children to represent the base 10 pictorially. 	Column method or children could count back 7. 

Column method using base 10 and having to exchange.

41 – 26

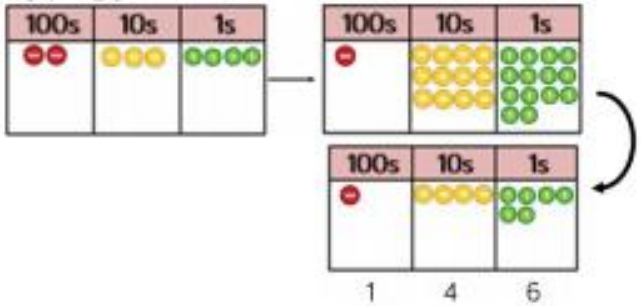


Represent the base 10 pictorially, remembering to show the exchange.

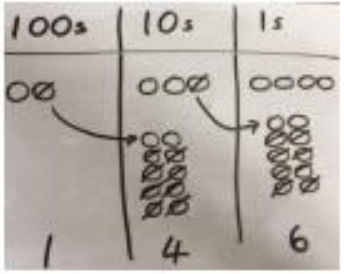
Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11.

Column method using place value counters.

234 – 88



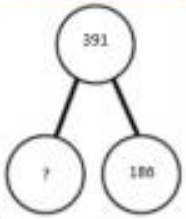
Represent the place value counters pictorially; remembering to show what has been exchanged.



Formal colum method. Children must understand what has happened when they have crossed out digits.

$$\begin{array}{r} {}^{2}\not{2}\,{}^{1}\not{3}4 \\ -\ 88 \\ \hline 6 \end{array}$$

Conceptual variation; different ways to ask children to solve 391 - 186



391	
186	?

Raj spent £391, Timmy spent £186.
How much more did Raj spend?

Calculate the difference between 391 and 186.

☐ = 391 – 186

391

-186

___

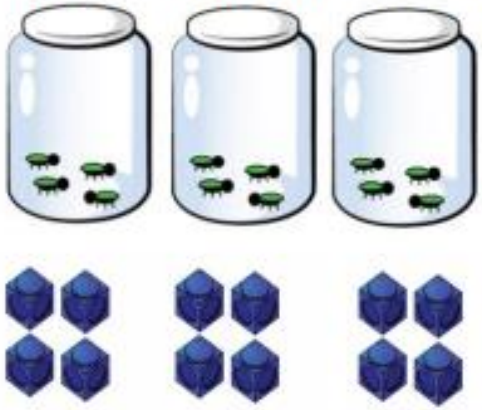
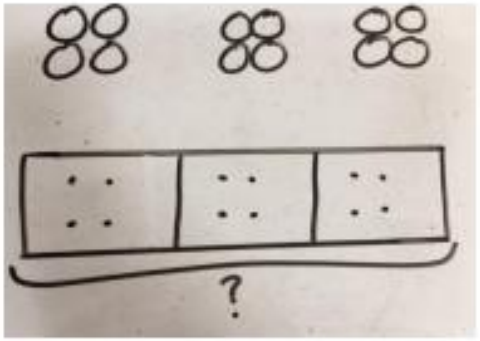
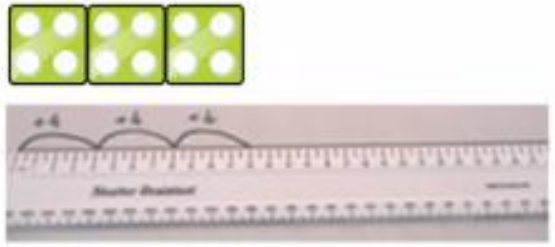
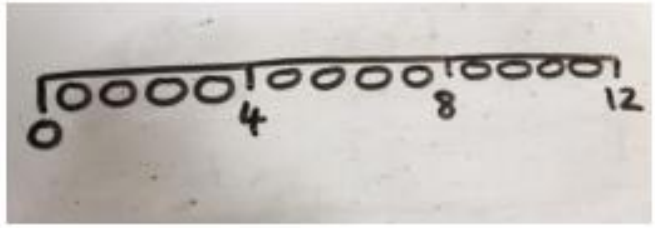
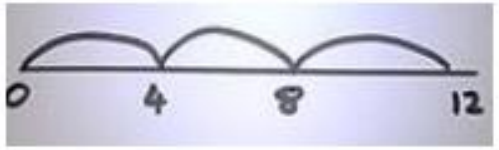
What is 186 less than 391?

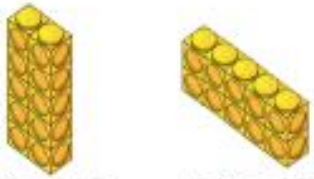
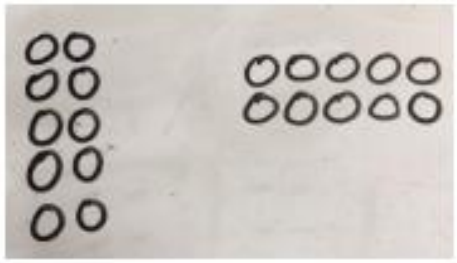
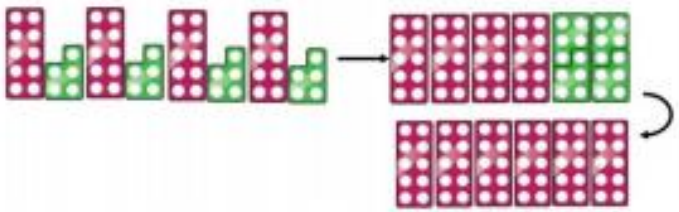
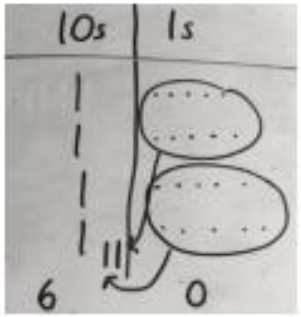
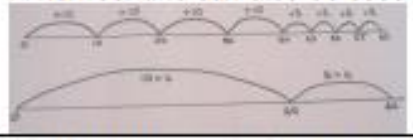
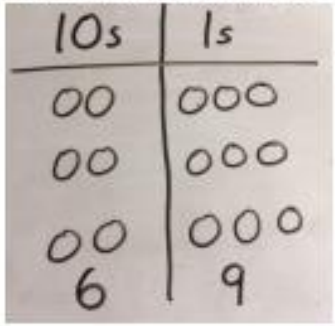
Missing digit calculations

$$\begin{array}{r} 3\ 9\ \square \\ -\ \square\,\square\ 6 \\ \hline \square\ 0\ 5 \end{array}$$

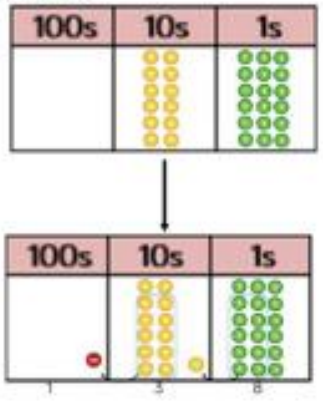
Calculation policy: Multiplication

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups.

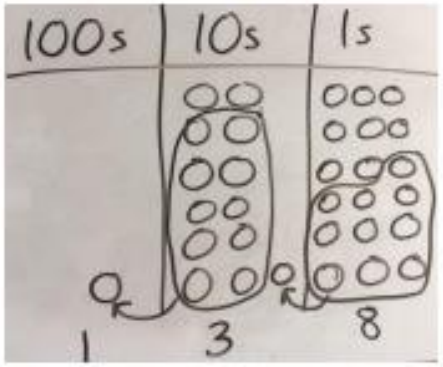
Concrete	Pictorial	Abstract
Repeated grouping/repeated addition 3 × 4 4 + 4 + 4 There are 3 equal groups, with 4 in each group. 	Children to represent the practical resources in a picture and use a bar model. 	3 × 4 = 12 4 + 4 + 4 = 12
Number lines to show repeated groups- 3 × 4  Cuisenaire rods can be used too.	Represent this pictorially alongside a number line e.g.: 	Abstract number line showing three jumps of four. 3 × 4 = 12 

Use arrays to illustrate commutativity counters and other objects can also be used. $2 \times 5 = 5 \times 2$  2 lots of 5 5 lots of 2	Children to represent the arrays pictorially. 	Children to be able to use an array to write a range of calculations e.g. $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$
Partition to multiply using Numicon, base 10 or Cuisenaire rods. 4×15 	Children to represent the concrete manipulatives pictorially. 	Children to be encouraged to show the steps they have taken. 4 x 15 10 5 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60 A number line can also be used 
Formal column method with place value counters (base 10 can also be used.) 3×23 	Children to represent the counters pictorially. 	Children to record what it is they are doing to show understanding. 3×23 20 3 $3 \times 20 = 60$ $3 \times 3 = 9$ $60 + 9 = 69$ 23 × 3 69

Formal column method with place value counters.
6 x 23



Children to represent the counters/base 10, pictorially e.g. the image below.



Formal written method

$$6 \times 23 =$$

$$\begin{array}{r} 23 \\ \times\ 6 \\ \hline 138 \\ \hline 1\ 1 \end{array}$$

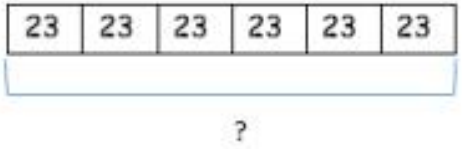
When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract:

To get 744 children have solved 6 × 124.
To get 2480 they have solved 20 × 124.

$$\begin{array}{r} 1\ 2\ 4 \\ \times\ \ 2\ 6 \\ \hline 7\ 4\ 4 \\ 2\ 4\ 8\ 0 \\ \hline 3\ 2\ 2\ 4 \\ \hline 1\ 1 \end{array}$$

Answer: 3224

Conceptual variation; different ways to ask children to solve 6 × 23



Mai had to swim 23 lengths, 6 times a week.
How many lengths did she swim in one week?

With the counters, prove that 6 x 23 = 138

Find the product of 6 and 23

6 × 23 =

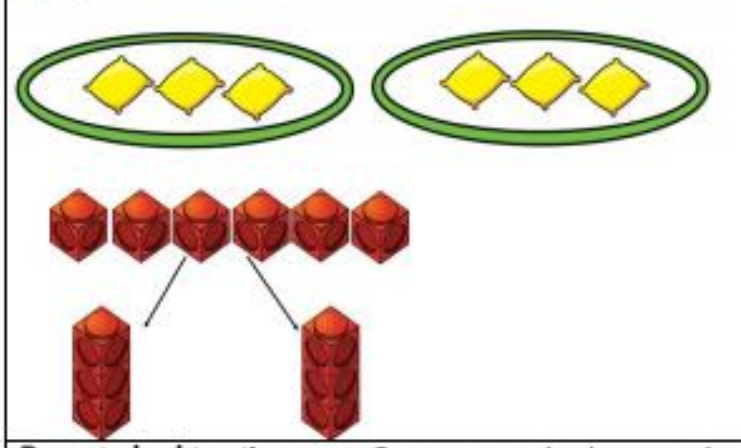
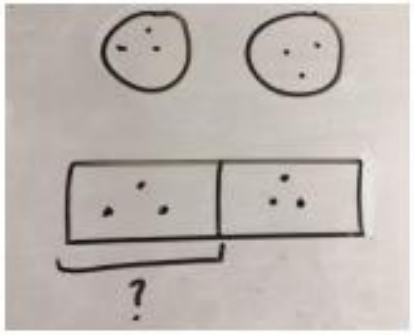
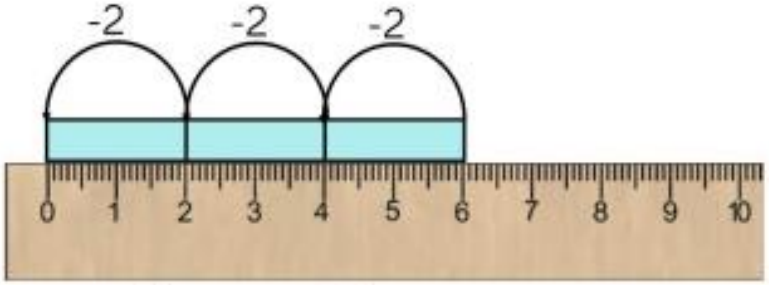
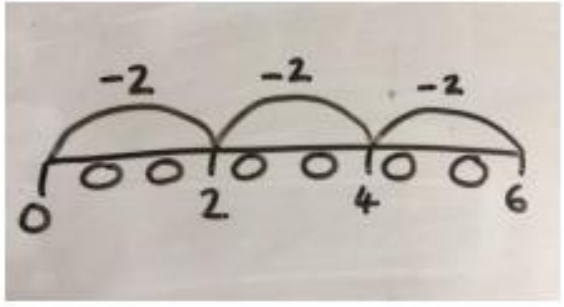
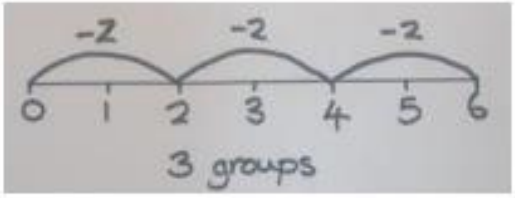
□ = 6 × 23

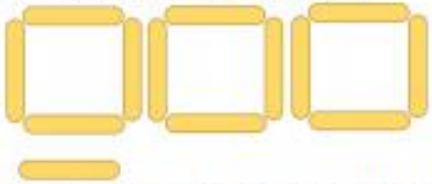
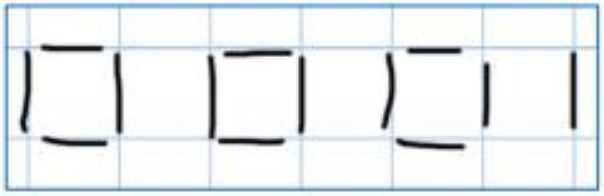
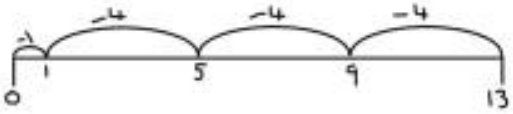
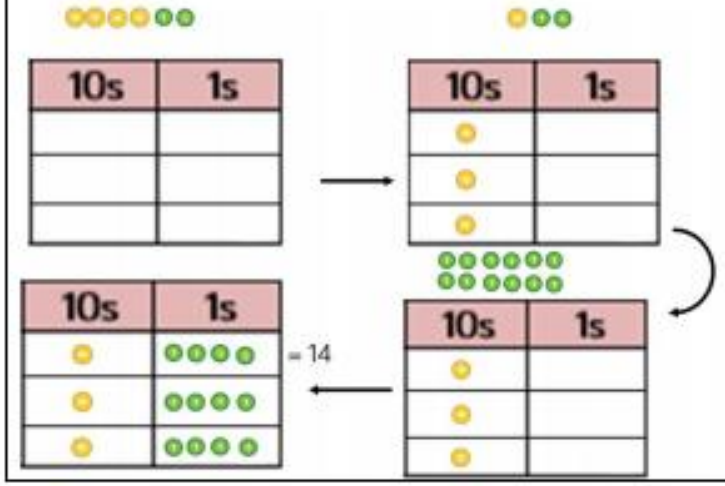
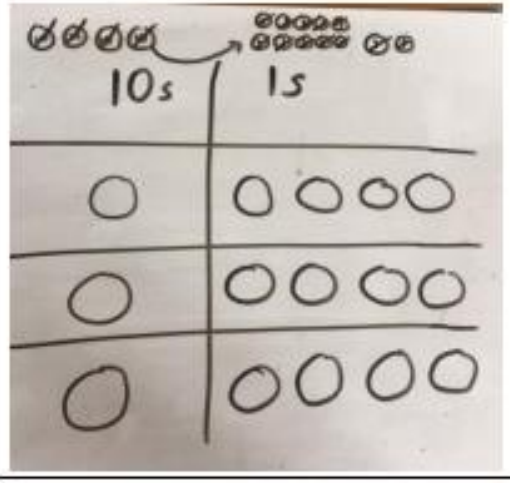
$$\begin{array}{r} 6 \\ \times\ 23 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times\ 6 \\ \hline \\ \hline \end{array}$$

What is the calculation?
What is the product?

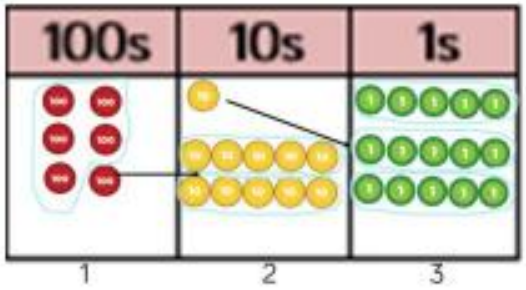
Calculation policy: Division

Key language: share, group, divide, divided by, half.

Concrete	Pictorial	Abstract
Sharing using a range of objects. 6 ÷ 2 	Represent the sharing pictorially. 	6 ÷ 2 = 3 3 | 3 Children should also be encouraged to use their 2 times tables facts.
Repeated subtraction using Cuisenaire rods above a ruler. 6 ÷ 2  3 groups of 2	Children to represent repeated subtraction pictorially. 	Abstract number line to represent the equal groups that have been subtracted. 

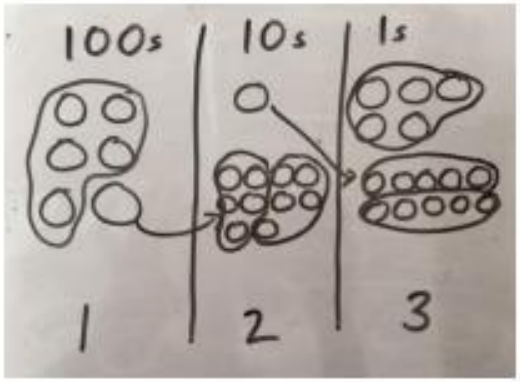
2d ÷ 1d with remainders using lollipop sticks. Cuisenaire rods, above a ruler can also be used. 13 ÷ 4 Use of lollipop sticks to form wholes- squares are made because we are dividing by 4.  There are 3 whole squares, with 1 left over.	Children to represent the lollipop sticks pictorially.  There are 3 whole squares, with 1 left over.	13 ÷ 4 = 3 remainder 1 Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line. '3 groups of 4, with 1 left over' 
Sharing using place value counters. 42 ÷ 3 = 14 	Children to represent the place value counters pictorially. 	Children to be able to make sense of the place value counters and write calculations to show the process. 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14

Short division using place value counters to group.
615 ÷ 5



1. Make 615 with place value counters.
2. How many groups of 5 hundreds can you make with 6 hundred counters?
3. Exchange 1 hundred for 10 tens.
4. How many groups of 5 tens can you make with 11 ten counters?
5. Exchange 1 ten for 10 ones.
6. How many groups of 5 ones can you make with 15 ones?

Represent the place value counters pictorially.

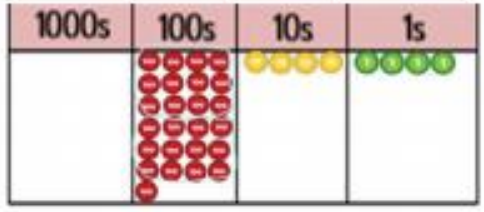


Children to the calculation using the short division scaffold.

$$5\overline{)615}^{\,1\,1}\quad 123$$

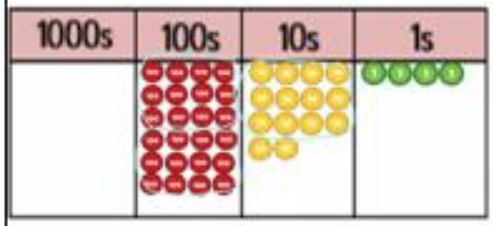
Long division using place value counters
2544 ÷ 12

We can't group 2 thousands into groups of 12 so will exchange them.



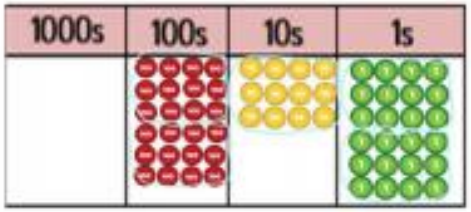
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$\begin{array}{r|l} & 02 \\ \hline 12 & 2544 \\ & 24 \\ \hline & 1 \end{array}$$



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$$

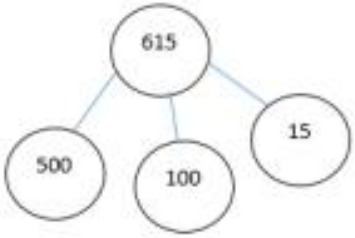


After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$

Conceptual variation; different ways to ask children to solve 615 ÷ 5

Using the part whole model below, how can you divide 615 by 5 without using short division?



I have £615 and share it equally between 5 bank accounts. How much will be in each account?

615 pupils need to be put into 5 groups. How many will be in each group?

$5\overline{)615}$

615 ÷ 5 =

☐ = 615 ÷ 5

What is the calculation?
What is the answer?

End of Year Expectations by Year Group

These charts cover the end of year expectations for children in each band. They are based on the end of year expectations from the National Curriculum. Each band's skills builds on the skills acquired in the previous band.

End of EYFS expectations:
I can use equipment to show and make any number up to 50 (fifty).
I can count to 50 (fifty) forwards and backwards from any number.
I can count in 2s (twos) and 10s (tens).
I know the number bonds up to 10 (ten).
I can add one-digit numbers including 0 (zero).
I can take away one-digit numbers including 0 (zero).
I can divide by sharing objects into sets that are the same size.
I can divide by grouping objects into groups that are the same size.
I can use arrays to help me multiply numbers.
I can tell the time to the nearest hour.

End of Year Expectations by Year Group

Year 1 Expectations		
If I am BEGINNING this I can…	If I am WITHIN this I can…	If I am SECURE in this I can…
…count forwards from 1 (one) to 50 (fifty).	…count forwards and backwards to 100 (one hundred).	…count forwards and backwards from any number with numbers bigger than 100 (one hundred).
…say one more or one less than any number less than 10 (ten).	…say one more or any less than any number less than 20 (twenty).	…say one more or one less than any number greater than 20 (twenty).
…use objects to help me add and subtract numbers up to 10 (ten).	…add and subtract numbers up to 20 (twenty).	…find the missing number in problems where the answer is less than 20 (twenty) e.g. 7 + ? = 10.
…count objects in lots of 2 (two).	…count objects in groups of 2 (two) and 10 (ten).	…count objects in groups of 2(two), 5 (five) and 10 (ten). I know my 2 Times Tables recalling all the multiplication and division facts for the 2 Times Tables.
…use objects to help me double and halve numbers up to 10 (ten).	…recall addition and subtraction facts for numbers up to 10 (ten).	…double and halve numbers up to 20 (twenty).
…write and identify numbers greater than 20 (twenty).	…write and identify numbers greater than 50 (fifty).	…write and identify numbers in real-life situations.
…use objects to help me solve one-step multiplication and division problems.	…solve one-step multiplication and division problems using pictures and adult help.	…solve one-step multiplication and division problems using pictures.
…use objects to find pairs of numbers that total less than 10 (ten).	…use objects to find pairs of numbers that total less than 20 (twenty).	…represent and use number bonds to add, subtract, multiply and divide.
…use objects to help me multiply and divide.	…use arrays to help me multiply and divide with help.	…begin to use arrays to help me multiply and divide.
…group objects into two groups in different ways and say which way is two halves.	…say when objects, shapes or numbers are cut into halves or not.	…say if a shape, object or number is cut into halves or quarters or not.
…say when it is [x] o'clock.	…say when it is [x] o'clock and half past the hour with help.	…draw hands on a clock to o'clock and half past the hour.
…say if something happens before or after something else.	…use words to compare two times.	…use words to compare different time intervals.
…say what equipment I need to solve problems with length, height, mass, weight, capacity and volume using non-standard measurements.	…say what equipment I need to solve measuring problems and solve them with help and using standard measurements.	…say what equipment I need to solve measuring problems and solve them using standard measurements.
…use the correct words to compare two objects' length or height.	…use the correct words to compare two objects' length, height, weight, mass, volume and capacity.	…use the correct words to compare lots of objects' length, height, weight, mass, volume and capacity.
…choose a named shape from a group of 2D shapes and find shapes in my classroom and outdoor area with help.	…name 2D shapes even when they are turned around on my own.	…choose a named shape from a selection of 2D shapes on my own and discuss the properties of that shape.
…choose a named shape from a group of 3D shapes with help.	…name 3D shapes even when they are turned around.	…choose a named shape from a selection of 3D shapes on my own and discuss the properties of that shape.

End of Year Expectations by Year Group

Year2 Expectations		
If I am BEGINNING this I can…	If I am WITHIN this I can…	If I am SECURE in this I can…
…count forward in tens from numbers less than 10 (ten).	…count forward in tens from any number.	…count forward and backward in tens from any number.
…count forwards in steps of 2 (two) to see if a number is even.	…count forwards and backwards in steps of 2 (two) or 5 (five) to see if a number is in the sequence.	…continue sequences that go up and down where the gaps are 2 (two), 3 (three) and 5 (five) to check if numbers are in them.
…add and subtract mentally a one digit number and a two-digit number.	…add and subtract two-digit numbers mentally.	…add and subtract a three-digit and two-digit number mentally.
…say if one number is bigger than another and use the correct symbol between them (< or >).	…order sets of numbers and put the correct symbols between them (<, > and =)	…compare numbers to addition or subtraction calculations.
…use digit cards to create the largest number possible with help.	…use digit cards to make the greatest or smallest number possible with help.	…use digit cards to make the greatest or smallest number possible on my own.
…use my number facts with numbers less than 20 (twenty) help me with adding numbers where the answer is less than 50 (fifty).	…use my number facts with numbers less than 20 (twenty) to help me solve problems where the answer is less than 50 (fifty).	…use addition and subtraction facts to help me with larger numbers.
…recognise odd and even numbers and multiples of 2 (two), 5 (five) and 10 (ten).	…recall all of my 2 (two), 5 (five) and 10 (ten) times tables and can write down some associated division facts.	…recall all the multiplication division facts for the 2 (two), 5 (five) and 10 (ten) times tables.
…use subtraction to help me solve a missing number problem that involves addition with help.	…use the inverse to check addition and subtraction problems with help.	…use the inverse to check addition or subtraction problems.
…use pictorial methods to help me solve addition and subtraction word problems about numbers, quantities and measures.	…use written methods to help me solve addition and subtraction word problems about numbers, quantities and measures.	…choose the correct written method to solve a word problem.
…use objects to help me solve multiplication and division word problems.	…use pictorial methods to help me solve multiplication and division word problems about numbers, quantities and measures.	…use written methods to help me solve multiplication and division word problems about numbers, quantities and measures.
…recall pairs of numbers that add to 10 (ten) and can solve missing number problems with numbers less than 20 (twenty) with help.	…recall addition and subtraction facts for numbers less than20 (twenty) and can solve missing number problems on my own.	…recall addition and subtraction facts for numbers to 20 (twenty) and can use these to help me with problems with numbers up to 100 (one hundred).
…put objects into four equal groups and know that one group is a quarter and three groups is three quarters.	…can put objects into three or four equal groups and can name and write the fractions.	…can tell if a shape is cut into thirds or quarters and can name the equivalent fractions.
…solve problems where I have to add pennies and the answer is less than £1.	…solve problems where I have to give change from £1.	…solve problems where I have to buy two or more objects and give change from £1.
…answer questions using tally charts or pictograms with help.	…answer questions using tally charts, block diagrams, simple tables or pictograms with help.	…answer questions using tally charts, block diagrams, simple tables or pictograms on my own.
…use data to answer questions about one category.	…answer questions where I have to compare two categories with help.	…answer questions where I have to compare two categories on my own.

End of Year Expectations by Year Group

Year 3 Expectations		
If I am BEGINNING this I can…	If I am WITHIN this I can…	If I am SECURE in this I can…
…count up in lots of 100 (one hundred).	…count up and down in lots of 200 (two hundred).	…count up and down in multiples of 100 (one hundred).
…find 10 (ten) more than any number less than 50 (fifty).	…find 10 (ten) more or less than any number.	…find 100 (one hundred) more or less than any number.
…count in lots of 4 (four.	…count in lots of 8 (eight).	…count in lots of 50 (fifty).
…find the hundreds digit in a three-digit number.	…identify every the value of each digit in a three-digit number.	…use digit cards to make the greatest and smallest three-digit numbers possible.
…use objects to solve number problems with three-digit numbers.	…solve addition, subtraction, multiplication and division problems with three-digit numbers with help.	…solve addition, subtraction, multiplication and division problems with three-digit numbers on my own.
…mentally add and subtract three-digit numbers and one-digit numbers.	…mentally add and subtract three-digit numbers and two-digit numbers.	…mentally add and subtract three-digit numbers.
…recall multiplication facts for the3 (three), 6 (six), 9 (nine) and 11 (eleven) times tables and use these to solve problems.	…recall division facts for the 3 (three), 6 (six), 9 (nine) and 11 (eleven) times tables.	…recall division facts for the 3 (three), 6 (six), 9 (nine) and 11 (eleven) times tables. and use these to solve problems.
…use jottings to help me solve multiplication and division calculations involving two-digit and one-digit numbers.	…solve multiplication and division calculations involving two-digit and one-digit numbers using a formal written method with support.	…solve multiplication and division calculations involving two-digit and one-digit numbers using a formal written method on my own.
…sort objects into equal groups and find a fraction of them with help.	…sort objects into equal groups and find fractions of them on my own.	…sort larger amounts of objects into equal groups and find fractions of them and write the fraction correctly.
…find fractions of objects where the numerator is more than 1 (one) with help.	…find fractions of objects where the numerator is more than 1 (one) on my own.	…find fractions of larger groups of objects where the numerator is more than 1 (one) and write the fraction correctly.
…count up and down in tenths and divide a whole into tenths with help.	…count up and down in tenths and divide more than one whole between 10 (ten) people and say what fraction each person gets with help.	…count up in tenths where the jump is more than 1/10 and divide more than one whole between 10 people and say what fraction each person gets on my own.
…use shapes to find fractions equivalent to ½.	…use shapes to find fractions equivalent to ¼.	…use shapes to find equivalent fractions where the numerator is more than 1 (one).
…place fractions where the numerators is 1 (one) on a number line with help.	…place fractions where the numerators is 1 (one) on a number line on my own.	…place fractions where the numerator is more than 1 (one) on a number line on my own.
…identify the digit after a decimal point as the tenths digit.	…convert tenths to decimals and vice versa.	…use numbers with one decimal place in the context of measurement.
…add simple fractions with the same denominator where the answer is less than one whole.	…add simple fractions with the same denominator where the answer is more than one whole.	…add and subtract fractions with the same denominator where the answer is more than one whole.
…tell the time to the nearest quarter of an hour on a clock marked with Roman numerals.	…tell the time to the nearest minute on a clock marked with Roman numerals.	…convert times between the 12 (twelve) hour and 24 (twenty-four) hour clocks.
…solve problems using money where I have to give change.	…use the same coins to make different amounts.	…solve problems where I have to work out the minimum number of coins needed and the answer is more than £1 (one pound).
…can compare sets of objects to find the longest, heaviest, etc.	…can solve measuring problems where I have to compare 2 (two) objects.	…can solve measuring problems where I have to compare more than 2 (two) objects.
…describe how to move somewhere using the language of right-angles to describe the turns.	…know the difference between a clockwise and anticlockwise turn.	…use the language of right-angles, clockwise and anticlockwise to describe how to get somewhere and then retrace the steps taken.
…answer questions about charts and pictograms where the symbol represents	…answer questions about charts and pictograms where the symbol represents	…answer questions about charts and pictograms with larger values and where

End of Year Expectations by Year Group

2 (two) objects.	4 (four) objects.	the symbol represents 4 (four) objects.
…draw a bar chart to show information.	…draw tables to collect information with help.	…draw tables to collect information and draw bar charts to show it on my own.
…describe simple 2D and 3D shapes using accurate language.	…sort 2D and 3D shapes in a variety of ways with help.	…sort 2D and 3D shapes in a variety of ways using their properties.
…relate real objects to 2D and 3D shapes with help.	…relate real objects to 2D and 3D shapes on my own.	…find 2D and 3D shapes in my classroom and outside and describe them based on their properties.

End of Year Expectations by Year Group

Year4 Expectations		
If I am BEGINNING this I can…	If I am WITHIN this I can…	If I am SECURE in this I can…
…count in lots of 1000 (one thousand).	…count in lots of 2000 (two thousand).	…count forwards and backwards where the jump is a multiple of 1000 (one thousand).
…count backwards past 0 (zero) to include negative numbers with help.	…count backwards past 0 (zero) to include negative numbers on my own.	…count forwards and backwards past 0 (zero) in jumps larger than 1 (one).
…use my knowledge of counting in 3s (threes) to help me count in 6s (sixes) and can start to count in 7s (sevens) and 9s (nines).	…can count confidently in 6s (sixes), 7s (sevens), 9s (nines) and 25 (twenty-fives).	…decide if a number is a multiple of 6 (six), 7 (seven), 9 (nine) or 25 (twenty-five) by counting up in those steps.
…choose the smaller or larger number out of two numbers bigger than 1000 (one thousand).	…order sets of numbers bigger than 1000 (one thousand).	…place the correct symbol (<, > or =) between numbers larger than 1000 (one thousand) or calculations.
…round three-digit numbers to the nearest multiple of 10 (ten) or 100 (one hundred).	…round four-digit numbers to the nearest multiple of 10 (ten) or 100 (one hundred).	…round four-digit numbers to the nearest multiple of 10 (ten), 100 (one hundred) or1000 (one thousand).
…solve two-step real-life problems involving addition and subtraction.	…solve two-step real-life problems involving addition and subtraction on my own and explain why I chose my methods with help and use the inverse to check my answers.	…solve two-step real-life problems involving addition and subtraction and explain why I chose my methods and check them on my own.
…recall all the multiplication facts up to 12 (twelve) x 12.	…recall all the multiplication facts up to 12 (twelve) x 12 and can derive the division facts.	…recall all the multiplication facts up to 12 (twelve) x 12 and can rapidly recall the related division facts.
…use jottings and partitioning to multiply a two-digit by a one-digit number.	…use formal written methods to multiply a two-digit by a one-digit number with help.	…use formal written methods to multiply a two-digit by a one-digit number.
…use a 10 (ten) x 10 square to show 1/10 and 1/100.	…count up in hundredths and can use a 10 (ten) x 10 square to show 1/10 and 1/100.	…use a 10 (ten) x 10 square to show that 1/10 is equivalent to 10/100 and can count up in hundredths where the jump is more than 1/100.
…use shapes to find equivalent fractions where the numerator is 1 (one) and the denominator is less than 10 (ten).	…use shapes to find equivalent fractions where the numerator is more that 1 (one) and the denominator is less than 10 (ten).	…use shapes to find equivalent fractions where the numerator is more that 1 (one) and the denominator is more than 10 (ten).
…place decimals with one place and less than 10 (ten) on a number line and say which integer they are closer to.	…place decimals with one place and greater than 10 (ten) on a number line and say which integer they are closer to.	…round decimals with one place and greater than 10 (ten) to the nearest integer.
…solve two-step problems involving measures or money using simple fractions and numbers with two decimal places.	…solve multi-step problems involving measures or money using simple fractions and numbers with two decimal places.	…solve multi-step problems involving measures or money using fractions and numbers with two decimal places.
…can convert hours to minutes.	…use multiplication to convert larger units of time to smaller ones with help.	…use multiplication to convert larger units of time to smaller ones on my own.
…convert from larger to smaller metric units with help.	…convert from larger to smaller metric units on my own.	…use knowledge of place value and the relationship between units to convert units on my own.
…identify the lines of symmetry in simple shapes and patterns.	…identify the lines of symmetry in shapes and patterns.	…identify the line of symmetry in shapes and patterns even when the mirror line does not dissect the shape.
…sort shapes into a Carroll or Venn diagram with help.	…use the properties of shapes to sort them into a Carroll or Venn diagram using two criteria.	…use the properties of shapes to sort them into a Carroll or Venn diagram with more than two criteria.
…calculate the perimeter and area of a rectangle using centimetres.	…calculate the perimeter and area of a rectangle using metres and centimetres.	…calculate the perimeter and area of a shape made of more than one rectangle or square.
…plot the vertices of a polygon and join them in the correct order to complete the shape with help.	…plot the vertices of a polygon and join them in the correct order to complete the shape on my own.	…plot the vertices of a polygon and find missing vertices when I know the properties of the shape.

End of Year Expectations by Year Group

…collect data to create bar charts, pictograms, tables and other graphs and can create and answer questions about my data.	…create a line graph to show how something changes over time and can explain why a bar chart would not be appropriate for this.	…create bar charts, pictograms and other graphs using grouped data.

End of Year Expectations by Year Group

Year 5 Expectations		
If I am BEGINNING this I can…	If I am WITHIN this I can…	If I am SECURE in this I can…
…count forwards through 0 (zero) and other negative numbers.	count forwards and backwards through 0 (zero) and other negative numbers.	…count forwards and backwards through 0 (zero) when I start at any negative or positive number and with jumps of more than 1 (one).
…read and write numbers that are multiples of 100 (one hundred) up to 1,000,000 (one million).	…write a six-digit number and state the value of each digit.	…create a number with 6 (six) digit cards and write it in words.
…compare a negative and positive number.	…compare two negative numbers.	…order sets of negative and positive numbers.
…compare two numbers with up to six digits.	…compare sets of numbers with up to six digits.	…place the correct sign (<, > or =) between two six-digit numbers.
…add and subtract mentally a three- digit number) and a five-digit number that are multiples of 10 (ten).	…add and subtract mentally a three-digit number and a five-digit number.	…add and subtract mentally a four-digit number and a five-digit number.
…solve problems using my knowledge of multiples and square numbers.	…solve problems using my knowledge of multiples, squares, and factors.	…solve problems using my knowledge of multiples, squares, cubes and factors.
…solve problems involving scaling and simple amounts in context.	…solve problems involving scaling and larger amounts in context.	…solve problems involving scaling and fractions with larger amounts in context.
…round numbers less than 1000 (one thousand) to the nearest multiple of 10 (ten), 100 (one hundred) or 1000.	…round numbers less than 10000 (ten thousand) to the nearest multiple of 10 (ten), 100 (one hundred), 1000 (one thousand) or 10000.	…round numbers less than 1000000 (one million) to the nearest multiple of 10 (ten), 100 (one hundred), 1000 (one thousand), 10000 (ten thousand), 1000000 (one hundred thousand) or 1000000.
…know all the factors of numbers below 10 (ten) and know the multiples of all numbers in the 12 (twelve) x 12 multiplication grid.	…know all the factors and multiples of numbers below 20 (twenty) and can find common factors of those numbers.	…know all the factors and multiples of numbers below 50 (fifty) and can find common factors of numbers.
…use columnar methods to add and subtract four-digit numbers with help.	…use columnar methods to add and subtract five-digit numbers with help.	…use columnar methods to add and subtract five-digit numbers on my own.
…write ½ (one half), ¼ (one quarter), 1/5 (one fifth) and tenths as decimals, fractions and percentages.	…turn halves, fifths, quarters and tenths into decimals.	…turn any fraction with a denominator that is a multiple of 10 (ten) or 25 (twenty-five) into a decimal or percentage.
…solve problems which require knowing and comparing the above decimal, fraction and percentage equivalents.	…solve problems which require knowing and comparing the above decimal, fraction and percentage equivalents.	…solve problems which require knowing and comparing the above decimal, fraction and percentage equivalents.
…use pictures to help me compare the size of fractions whose denominators are multiples of the same number.	…identify the smaller fraction from two whose denominators are multiples of the same number and where the denominator is less than 10 (ten).	…identify the smaller fraction from two whose denominators are multiples of the same number and where the denominator is more than 10 (ten).
…use a decimal scale to help me order numbers with 1 (one) or 2 (two) decimal places.	…order two decimal numbers with up two 3 (three) decimal places.	…order two decimal numbers with up two 3 (three) decimal places and write another number between them.
…order mixed and improper fractions with the same denominator.	…order mixed and improper fractions with different denominators with help.	…order mixed and improper fractions with different denominators on my own.
…can convert metric measurements to a smaller or larger unit of measurement with help.	…can convert metric measurements to a smaller or larger unit of measurement on my own	…can convert metric measurements with 1 (one) decimal place to a smaller unit of measurement on my own.
…use a ruler to measure the perimeter of a shape made of rectangles with help and can calculate the perimeter of drawings of shapes when I am given the dimensions.	…use a ruler to measure the perimeter of a shape made of rectangles on my own and can calculate the perimeter of drawings of shapes when I am given the dimensions.	…estimate and use a ruler to measure the perimeter of a shape made of rectangles on my own and can calculate the perimeter of drawings of shapes when I am given the dimensions.
…calculate and compare the areas of rectangles.	…find a single answer to a problem related to the possible area of a rectangle.	…solve problems related to the areas of rectangles with lots of possible answers.

End of Year Expectations by Year Group

…describe the faces, edges and vertices of a 3D shape.	…identify 3D shapes from perspective drawings.	…identify 3D shapes from isometric or perspective drawings.
…draw an angle of a set number of degrees that is less than 180 and a line of a given distance.	…draw any angle accurately.	…draw any given angle and shapes with the lengths of sides to the nearest millimetre.
…say if a polygon is regular or irregular with help.	…say if a polygon is regular or irregular on my own.	…use Carroll or Venn diagrams to sort shapes with equally sized angles and equally sized sides.
…answer simple problems based on complex tables, such as timetables, with help.	…answer two-step problems based on complex tables, such as timetables, with help.	…answer two-step problems based on complex tables, such as timetables, on my own.
…complete complex tables with help.	…complete complex tables on my own.	…complete complex tables on my own and explain my reasoning.
…use a line graph to answer questions with help.	…use a line graph to answer questions.	…compare two values on a line graph and calculate the difference between them.
…recall all the multiplication facts up to 12 (twelve) x 12.	…recall all the multiplication facts up to 12 (twelve) x 12 and can derive the division facts.	…recall all the multiplication facts up to 12 (twelve) x 12 and can rapidly recall the related division facts.

End of Year Expectations by Year Group

Year 6 Expectations		
If I am BEGINNING this I can…	If I am WITHIN this I can…	If I am SECURE in this I can…
…calculate the difference between a negative number and 0 (zero).	…calculate the difference between a negative number and a positive number with help.	…calculate the difference between a negative number and a positive number on my own.
…answer problems where I have to compare a positive and a negative number in context.	…answer problems where I have to compare two negative numbers in context.	…answer problems where I have to compare sets of negative numbers in context.
…round any number up to 1000000 (one million) to the nearest 10 (ten), 100 (one hundred), 1000 (one thousand) or 10000 (ten thousand).	…round any three or four-digit number to different degrees of accuracy, such as the nearest 30.	…round any number less than 10,000,000 (ten million) to different degrees of accuracy, such as the nearest 50 (fifty).
…solve two-step addition and subtraction problems in unfamiliar contexts.	…solve multi-step addition and subtraction problems in unfamiliar contexts.	…solve multi-step addition and subtraction problems in unfamiliar contexts and can explain my reasoning.
…multiply a three-digit by a two-digit number using formal methods with jottings to help me.	…multiply a four-digit by a two-digit number using long multiplication.	…multiply a four-digit by a two-digit number using short multiplication.
…divide a three-digit number by a two- digit number using the formal method of long division with jottings to help me.	…divide a four-digit number by a two- digit number using the formal method of long division with jottings to help me.	…divide a four-digit number by a two-digit number using the formal method of long division.
…check my answers to problems and know to round answers in the context of money to 2 (two) decimal places.	…check my answers to problems and know where it is appropriate to round my answers.	…check my answers to any problem and represent my answer in different ways or round it if appropriate.
…know all the decimal and percentage equivalents of halves, quarters and tenths.	…know the decimal and percentage equivalents of halves, quarters, thirds, fifths and tenths.	…know the decimal and percentage equivalents of halves, quarters, thirds, fifths, eights and tenths and can use this to help me solve problems.
…solve division problems where the answer has up to 2 (two) decimal places with jottings and help.	…solve division problems where the answer has up to 2 (two) decimal places using a formal written method.	…solve division problems where the answer has up to 2 (two) decimal places and the divisor is larger than 12 (twelve).
…solve measuring problems where the answer may have 1 (one) decimal place.	…solve measuring problems where the answer may have up to 2 (two) decimal places.	…solve measuring problems where the answer may have up to 3 (three) decimal places.
…sort shapes using a Carroll or Venn diagram using criteria based on the shapes' properties such as symmetry, parallel lines, etc with help.	…sort shapes using a Carroll or Venn diagram with more than two areas using criteria based on the shapes' properties such as symmetry, parallel lines, etc with help.	…sort shapes using a Carroll or Venn diagram with more than two areas using criteria based on the shapes' properties such as symmetry, parallel lines, etc on my own.
…find unknown angles and lengths on triangles, quadrilaterals and regular polygons with help.	…find unknown angles and lengths on triangles, quadrilaterals and regular polygons.	…find unknown angles and lengths on triangles, quadrilaterals and regular polygons in context.
…draw a shape after a translation or reflection with help.	…draw a shape after a translation or reflection on a coordinate grid with help.	…draw a shape after a translation or reflection on a coordinate grid on my own.
…answer simple questions about pie charts.	…compare two segments of a pie chart using fractions and percentages.	…answer complex questions about pie charts which may require estimation.
…create simple pie charts and comment on them and describe what a line graph is showing.	…create pie charts and line graphs and ask and answer questions about them with help.	…create pie charts and line graphs and ask and answer questions about them.
…compare and calculate the mean averages of multiple data sets.	…compare and calculate the mean averages of multiple data sets in context with help.	…compare and calculate the mean averages of multiple data sets in context.
…calculate percentages of amounts in contexts such measuring.	…calculate fractions and percentages in contexts such measuring and money.	…calculate and compare fractions and percentages in contexts such as money or measuring.
…use my knowledge of fractions and multiples to help me solve single-step problems with unequal sharing.	…use my knowledge of fractions and multiples to help me solve two-step problems with unequal sharing with help.	…use my knowledge of fractions and multiples to help me solve two-step problems with unequal sharing.

End of Year Expectations by Year Group

…know and can use the formula for the area of a rectangle,	…know and can use the formulae for the areas of triangles and rectangles.	…know and can use the formulae for the areas of triangles and a rectangles in context and can use these to find the area of compound shapes.
…recall all the multiplication facts up to 12 (twelve) x 12.	…recall all the multiplication facts up to 12 (twelve) x 12 and can derive the division facts.	…recall all the multiplication facts up to 12 (twelve) x 12 and can rapidly recall the related division facts.

Glossary

array - an organised collection of objects, counters or symbols, for example arranged in rows and columns 

bridging - the process of using a multiple of 10 or 100 as part of an addition or subtraction calculation, for example 45 + 13 can be thought of as 45 + 5 (50) + 8

decomposition - the standard written method for subtraction (see p10)

difference - the amount by which one number is greater than another - i.e. the result of a subtraction; the difference between 5 and 9 is 4

grid method - a method of calculating multiplication by separating the calculation into sections, each of which easier than the whole (see p12)

number track - a line of numbers used for counting or calculating, each section represents one number

1	2	3	4	5	6	7	8	9	10

numberline - a line where numbers are represented by points on it; numberlines always run from left to right

partitioning - separating a number into its different parts, eg 25 can be partitioned into 20 and 5

remainder - the amount left over in a division which cannot be grouped or shared equally