St George's

Church of England Primary School

Math's Policy

The Teaching and Learning of Maths at St. George's

INTENT:

It is our intent for our Maths curriculum to inspire pupils with a **curiosity and fascination** about Maths and how it exists in the **real world.** We want children to leave St George's ready for secondary school with a basic and **purposeful** foundation in Number, Calculation, Geometry, Statistics and measures. This foundation will enable them to access the Year 7 Curriculum and equip them with **basic life skills.** Teaching should equip pupils with the **strategies, procedures and thinking skills** required in order to develop a **conceptual understanding** of Maths. Children will develop this understanding through the **building of small steps** using a **Mastery approach** and using **concrete, pictorial and abstract models**. We want children to develop their **mathematical vocabulary** to enable them **to communicate** this conceptual understanding We want children to **make connections** with their Mathematical learning to other areas of the curriculum, making it more meaningful.

IMPLEMENTATION:

At the centre of the teaching and learning of Maths at St. George's is a belief in the **Mastery Approach.** The Mastery Approach is founded on the key principle that all pupils have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems. Similarly with calculation strategies, pupils must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of concrete materials and pictorial representations.

Planning for progression:

Maths is taught following the White Rose Mastery Approach to learning and following the small steps guidance to enable progression across the year group and across the whole school. All teachers follow a Mastery 5 part lesson structure (Do Now, New Learning, Talk Time, Develop Learning, Plenary) which builds progression within a lesson. Learning is supported by the use of concrete apparatus where appropriate such as: Base10, place value counters, cubes, counters, Numicon, Cuisennaire rods etc.

Knowledge walls/Key vocabulary

Children have access to key language and meanings in order to understand and readily apply to their written, mathematical and verbal communication of their skills, in a purposeful context. Models as well as misconceptions are displayed to support children's learning. All classrooms display sentence stems to promote responses in full sentences and to scaffold children's thinking when reasoning. Examples of reasoning work is also highlighted and displayed in classrooms.

Independent learning

In Maths children are encouraged to think and reason as much as possible with their units of work. Children have independent access to mathematical and non-mathematical equipment within the classroom which they are encourage to use independently in order to support visually when problem solving.

Due to Covid restrictions which includes the need for class bubbles, more mathematical equipment has been purchased in order to limit the need to share equipment between bubbles. More Numicon and Cuisennaire rods have been purchased to be predominantly contained within individual bubbles. Intervention groups also have their own equipment. Class teachers should clean this equipment when necessary. If equipment is shared between bubbles, it must first be cleaned with anti-bacterial spray or left in quarantine for 48 hours before use by another bubble.

IMPACT:

- Children will achieve at least age related expectations in Maths at the end of their cohort year.
- Children will be confident mental mathematicians using efficient and effective strategies.
- Children will retain Mathematical knowledge and develop skill within a purposeful, real life context.
- Children will work collaboratively and independently to solve problems and explain the processes that they have taken/ observed within a real life context
- Children will be able to communicate and reason about their mathematical understanding
- Children will be able to make connections with their mathematical learning and beyond.
- Children will have a positive, enthusiastic and curious approach to maths.
- Reduce the spread of infection with regards to Covid-19

Calculation Policy

The Four Operations

Progression in Calculation

YEAR 1

National Curriculum objectives linked to addition and subtraction

Pupils should be taught to:

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

Notes and guidance (non-statutory)

Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 – 7 = 9; 7 = 16 – 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.

Pupils combine and increase numbers, counting forwards and backwards.

They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

National Curriculum objectives linked to multiplication and division

Pupils should be taught to:

- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Notes and guidance (non-statutory)

Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.

They make connections between arrays, number patterns, and counting in twos, fives and tens.

Progression in Calculation

YEAR 2

National Curriculum objectives linked to addition and subtraction

Statutory requirements

Pupils should be taught to:

- solve problems with addition and subtraction:
- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

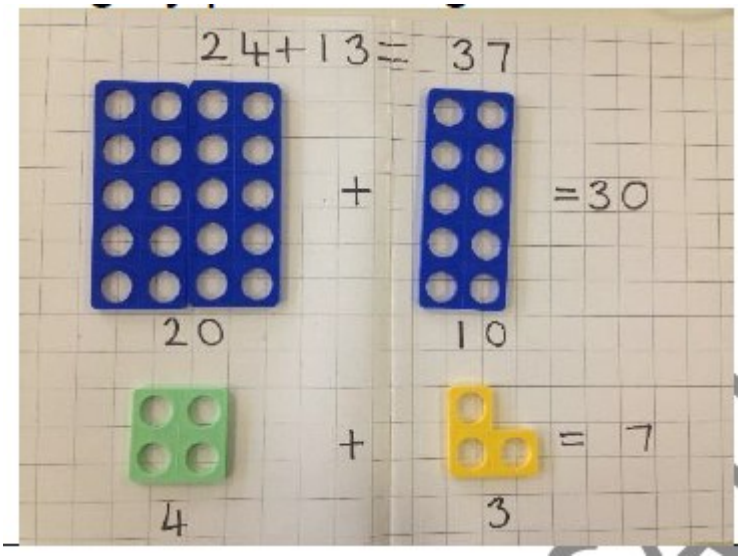
Notes and guidance (non-statutory)

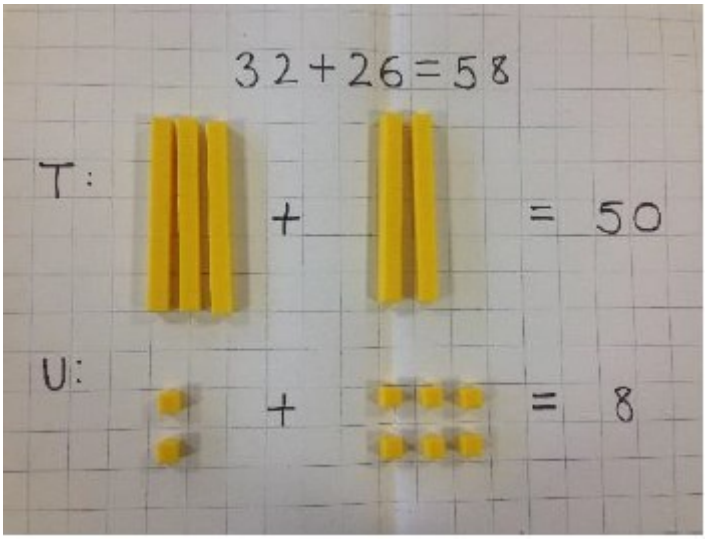
Pupils extend their understanding of the language of addition and subtraction to include sum and difference.

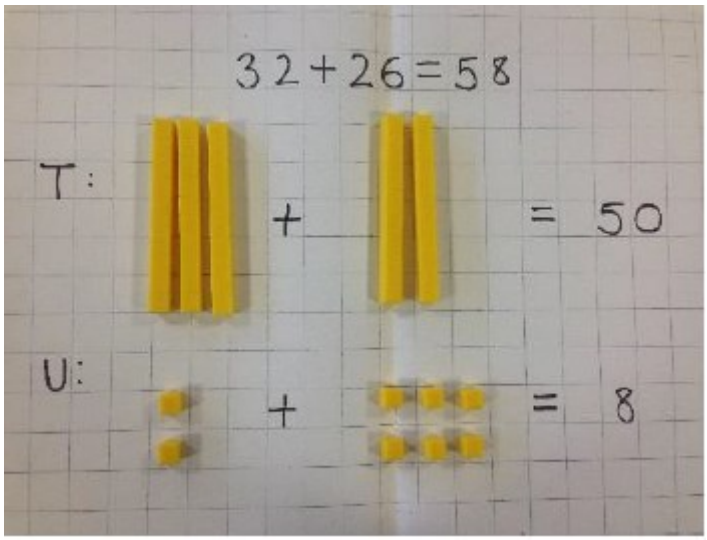
Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100; 100 – 70 = 30 and 70 = 100 – 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition.

Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger

numbers.


24+13= 37
20
10
=30
4
3
= 7


32+26=58
T:
= 50
U:
= 8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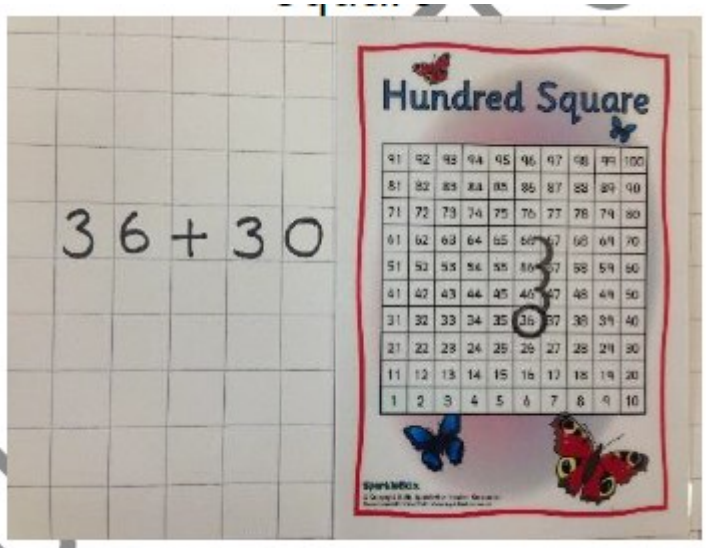
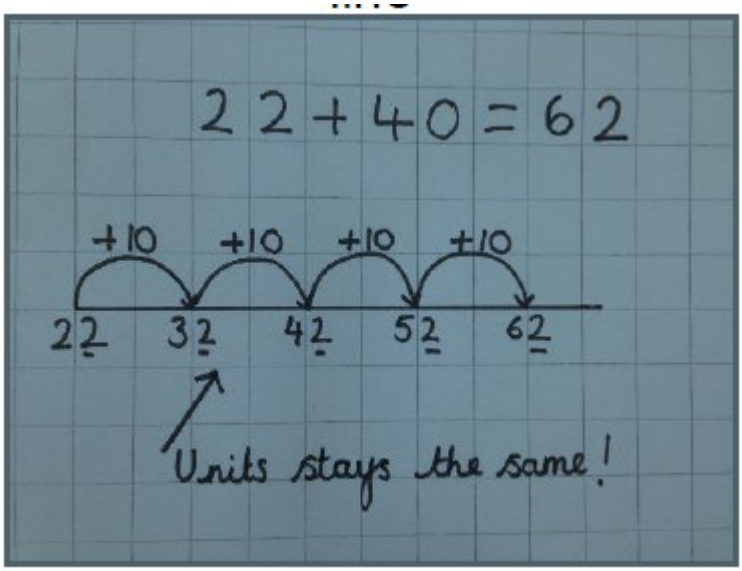
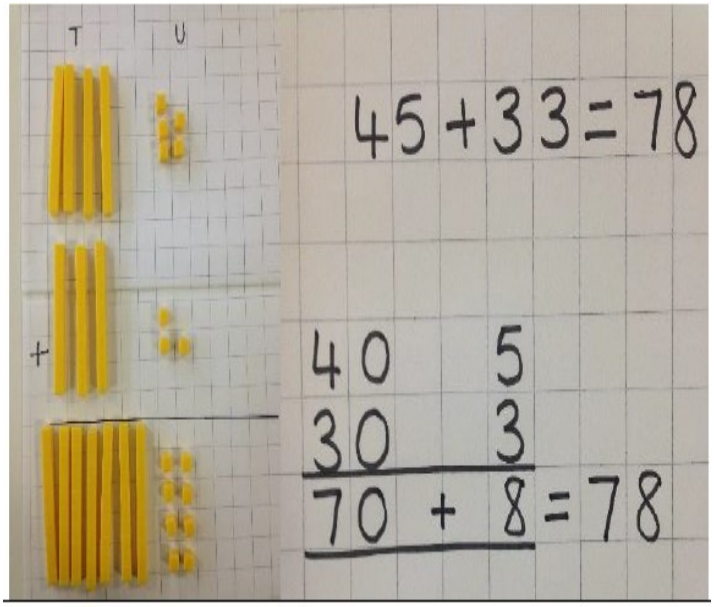

36+30
Hundred Square


22+40=62
+10
+10
+10
+10
22
32
42
52
62
Units stays the same!


T
U
45+33=78
40 5
30 3
70 + 8=78

Progression in Calculation

YEAR 2

National Curriculum objectives linked to multiplication and division.

Statutory Requirements:

Pupils should be taught to:

- 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 multiplication (×), division (÷) and equals (=) 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.

Notes and guidance (non-statutory)

Pupils use a variety of language to describe multiplication and division.

Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.

Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

Progression in Calculation

YEAR 3

National Curriculum objectives linked to addition and subtraction

Statutory Requirements:

Pupils should be taught to:

- add and subtract numbers mentally, including:
- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Notes and guidance (non-statutory)

Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.

Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent (see Mathematics Appendix 1).

National Curriculum objectives linked to multiplication and division

Statutory Requirements:

Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to

Progression in Calculation

YEAR 3

National Curriculum objectives linked to multiplication and division

Notes and guidance (non-statutory)

Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.

Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).

Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.

Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).

Progression in Calculation

YEAR 4

National Curriculum objectives linked to addition and subtraction

Statutory Requirements

Pupils should be taught to:

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

Notes and guidance (Non-Statutory requirements)

Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency (see Mathematics Appendix 1).

National Curriculum objectives linked to multiplication and division

Statutory Requirements

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Notes and guidance (non-statutory requirements)

Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency.

Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6).

Progression in Calculation

YEAR 4

Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers (see Mathematics Appendix 1).

Pupils write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60.

Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.

Progression in Calculation

YEAR 5

National Curriculum objectives linked to addition and subtraction

Statutory Requirements

Pupils should be taught to:

- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

Notes and guidance (Non-Statutory requirements)

Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency (see Mathematics Appendix 1).

They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162).

National Curriculum objectives linked to multiplication and division

Statutory Requirements

Pupils should be taught to:

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- 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
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Progression in Calculation

YEAR 5

Notes and guidance (non-statutory requirements)

Pupils practise and extend their use of the formal written methods of short multiplication and short division (see Mathematics Appendix 1). They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.

They use and understand the terms factor, multiple and prime, square and cube numbers.

Pupils 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 (for example, 98 ÷ 4 = = 24 r 2 = 24 = 24.5 ≈ 25). 4 98 2 1

Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.

Distributivity can be expressed as $a(b + c) = ab + ac$.

They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 9^2 x 10).

Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x).

Progression in Calculation

YEAR 6

National Curriculum objectives linked to addition , subtraction, multiplication and division

Statutory requirements

Pupils should be taught to:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Notes and guidance (non-statutory)

Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Mathematics Appendix 1).

They undertake mental calculations with increasingly large numbers and more complex calculations.

Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.

Pupils round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.

Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.

Common factors can be related to finding equivalent fractions.

Vocabulary

Ensure the correct vocabulary is used at all stages of learning

Addition Stage 1– 6

add, addition, more, plus, increase, sum, total, altogether, double, near double, difference, same as, equals, sign, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse, how many more to make…?, is the same as

Subtraction Stage 1– 6

subtract, subtraction, take away, minus, decrease, leave, how many are left/ left over?, difference between, half, halve, how many more/fewer is…/than…?, how much more/less is…?, is the same as, equals, sign, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse

Multiplication Stage 1– 6

counting,, steps, each, doubling, scaling, times, twice as big, ____ times as big, count in ones, count in _____, lots of, groups of, x, times, multiply, multiplies by, multiple of, once, twice, three times…, ten times…, times as (big, long, wide….and so on), repeated addition, array, row, column, double, group in pairs, threes...tens, equal groups of, multiplication, product, inverse

Division Stage 1– 6

halve, share, share equally, one each, two each, three each…, divide, division, divided by, divided into, left, left over, remainder, quotient, divisible by, inverse, exchange, repartition, divisor, scaling, repeated subtraction, array, row, column, equal groups of ___, ___ equal groups

Please note

- Use the language ‘calculation’ not ‘sum’ (sum means ‘plus’ or ‘total’)
- Use the language ‘digit’ not ‘number’ (number is the amount or quantity)

Addition

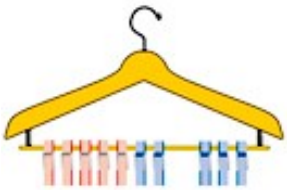
Stage 1

Children will use practical equipment to group objects and find a total. Practical resources will support children's maths to create mental pictures and images.

Children will represent calculations using objects and talk about their representations.

Children will start to understand the principal of exchange and will be able to use the terms, 'worth' and 'value'.

Stage 2



2 + 4 = 6

3 + 5= 8

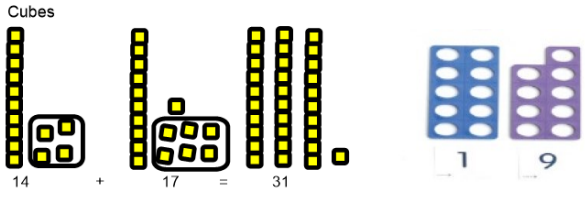
10 = 7 + 3
7 + 3 = 10
3 + 7 = 10

Practical resources will continue to support children's maths to create mental pictures and images. As these become firm, children will begin to develop ways to draw their own pictures.

Children will begin to use number sentences alongside their pictures and practical resources.

Children should be making the link between addition and subtraction.

Stage 3

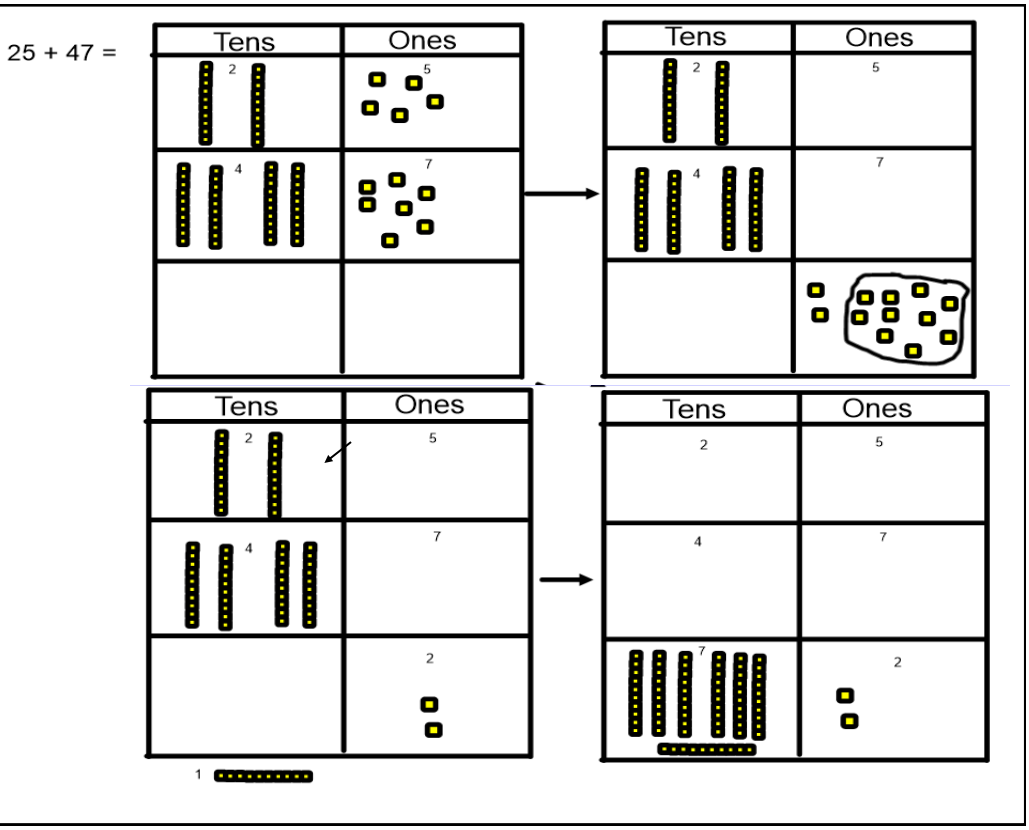


Children will be confidently using equipment to help them combine groups of objects with numbers up to 20.

They will continue to use equipment as well as number lines and hundred squares to support their mental methods.

Children will start to work with totals greater than 20 which will require them to use their knowledge of exchange.

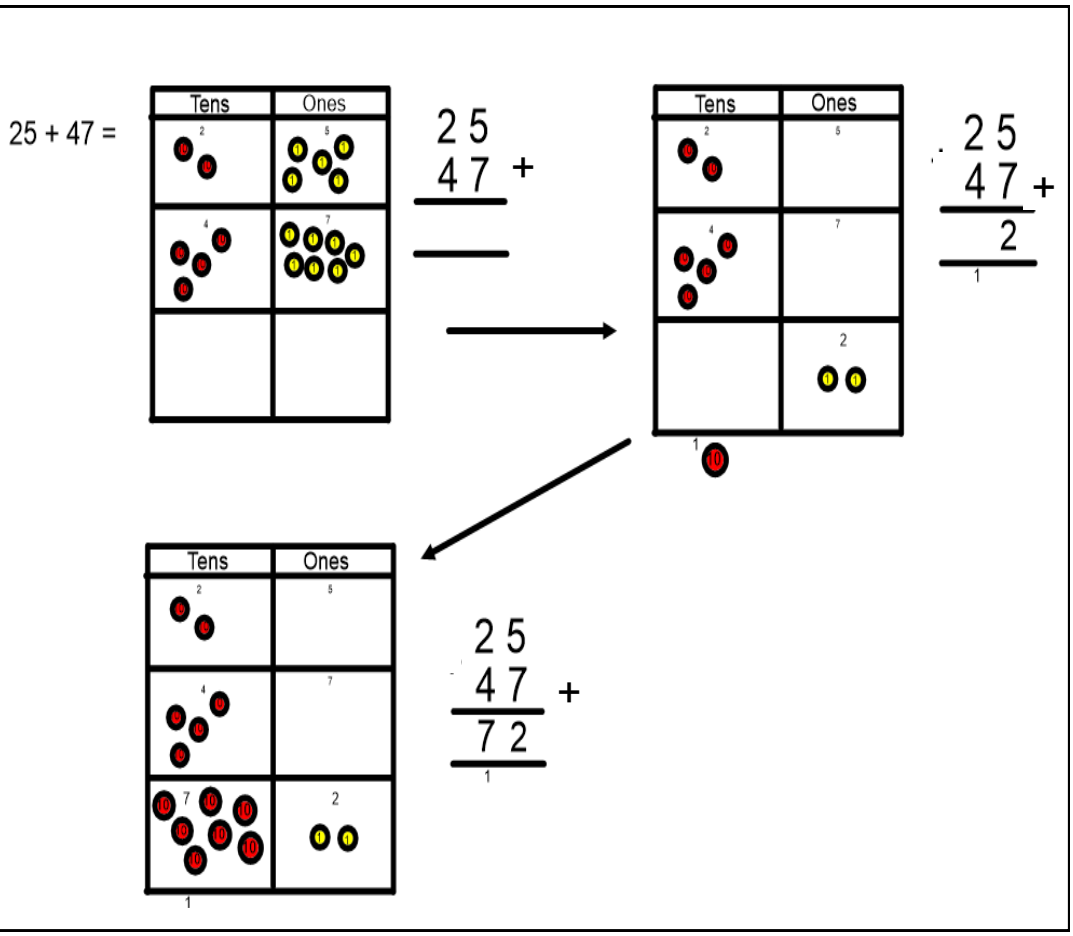
Stage 4



Children are now confident with using equipment to combine objects using the principal of exchange.

They will now begin to organise their equipment (straws, dienes, place value counters) in a vertical manner with their combined totals at the bottom.

Stage 5



Children will now be confident in organising their equipment in a vertical manner.

They will now be able to make links between this representation and the formal column addition when seen alongside each other.

Stage 6

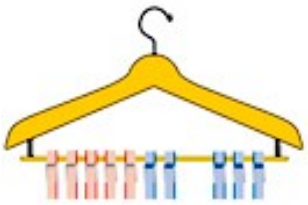
$$\begin{array}{r} 327 \\ 496 \\ \hline 823 \\ \hline 1\ \ 1 \end{array} +$$

Children will have a full understanding of the links between the equipment used and the formal written method.

They will now be able to explore calculating larger numbers as well as decimal numbers using their understanding of the formal written method.

Subtraction

Stage 1

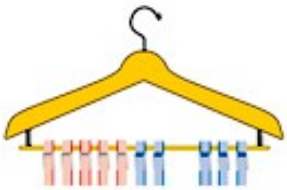


Children will use practical equipment to physically remove an amount from the group to find the total remaining.

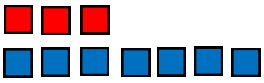
Children will represent calculations using objects and talk about their representations.

Children will be introduced to the language of comparison including equal use of 'less' and 'more'.

Stage 2



10 -7 =3
10 - 3 = 7
3 + 7 = 10



Number line. Biggest number on the right, count back.

? + 4 = 6
6– 4 = ?

3 + ?= 8
8-3 = ?

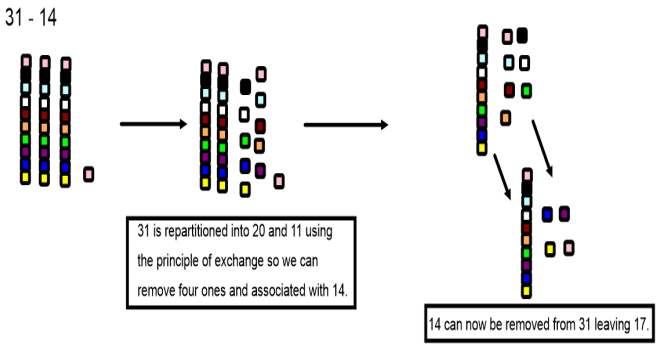
There are more blue than red.
There are less red than blue.
There are 4 more blue than red.
There are 4 less red than blue.

Practical resources will continue to support children's maths to create mental pictures and images. As these become firm, children will begin to develop ways to draw their own pictures.

Children will begin to use number sentences alongside their pictures and practical resources.

Children should be making the link between addition and subtraction.

Stage 3



Children will be confidently using equipment to help them take away and find the difference.

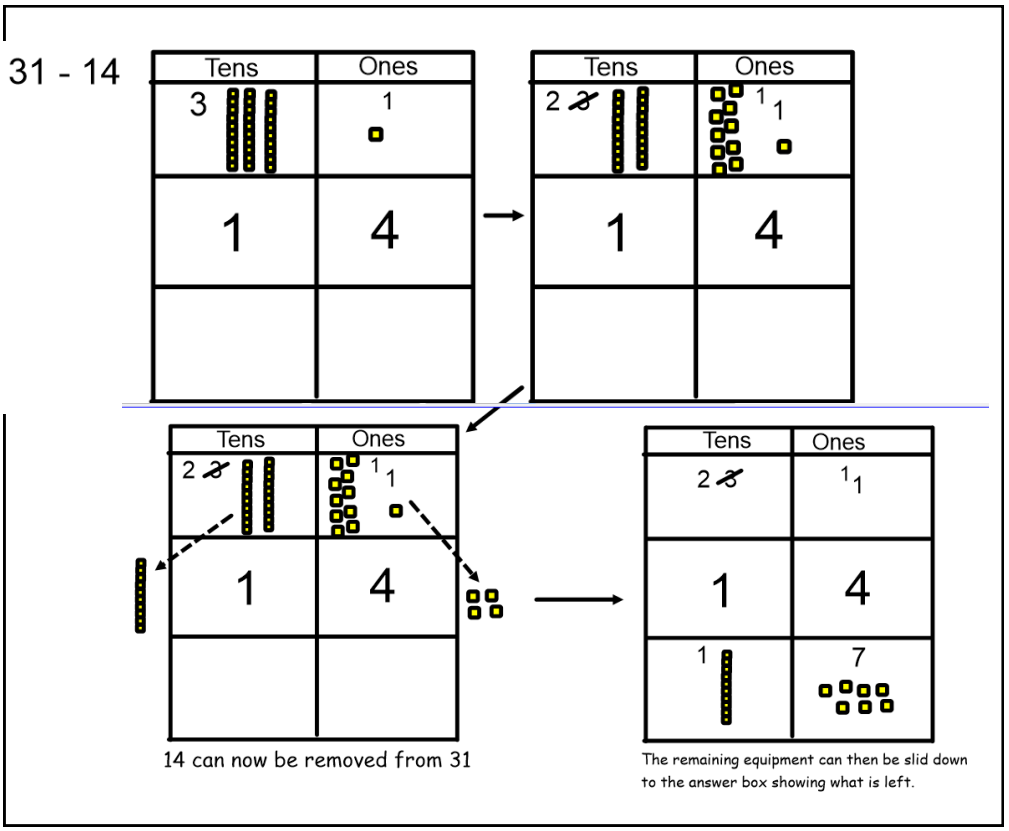
They will continue to use equipment as well as number lines and hundred squares to support their mental methods.

Children will start to work with numbers greater than 20 which will require them to use their knowledge of exchange.

As they become accustomed to repartitioning numbers, they can be introduced to formal notation of the repartitioning

For example: $^{2}\not{3}\,^{1}\,1$

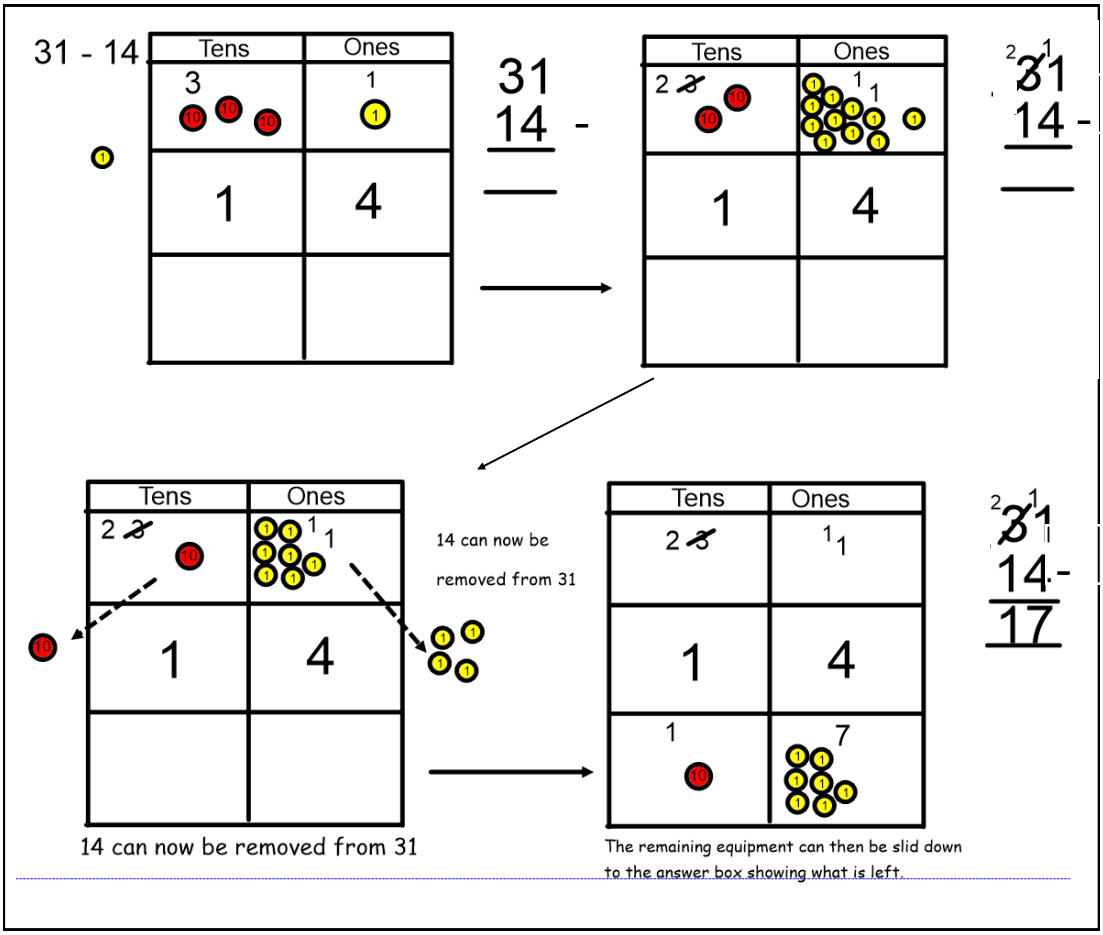
Stage 4



Children are now confident with using equipment to take away and find the difference using the principal of exchange.

They will now begin to organise their equipment (straws, dienes, place value counters) in a vertical manner with the amount that remains at the end situated at the bottom.

Stage 5



Children will now be confident in organising their equipment in a vertical manner.

They will now be able to make links between this representation and the formal column subtraction when seen alongside each other.

Stage 6

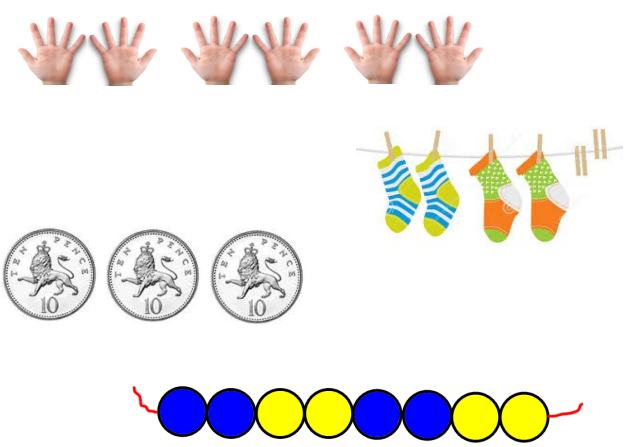
$$\begin{array}{r} {}^{7}\not{8}\,{}^{1}4 \\ 259 \\ \hline 525 \end{array}$$

Children will have a full understanding of the links between the equipment used and the formal written method.

They will now be able to explore calculating larger numbers as well as decimal numbers using their understanding of the formal written method.

Multiplication

Stage 1

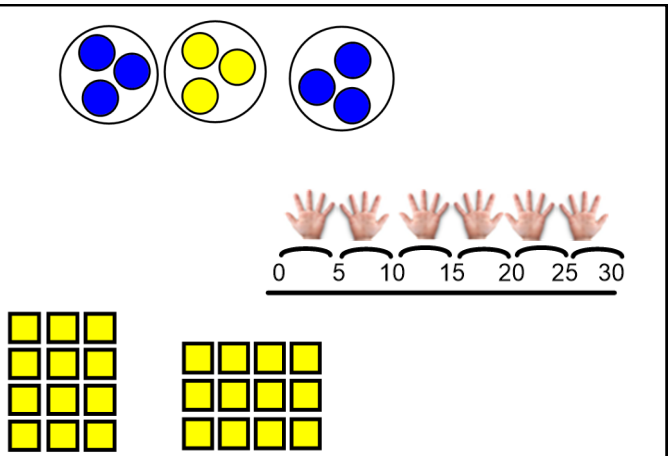


Children will physically show equal groups using a wide range of practical equipment.

Children will begin to count in different multiples including twos, fives and tens and making links to natural groupings eg socks, legs on animals etc.

Children start to recognise patterns of multiples using equipment.
They will start to use the language and representations for doubling.

Stage 2



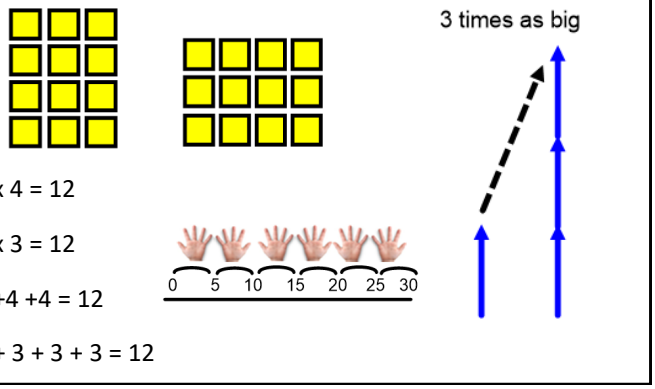
Children will start to sort objects into equal groups to aid counting.

They will continue to count in multiples and begin to relate this to multiplication using finger counting.

Children will experience a variety of representations of repeated addition alongside practical equipment.

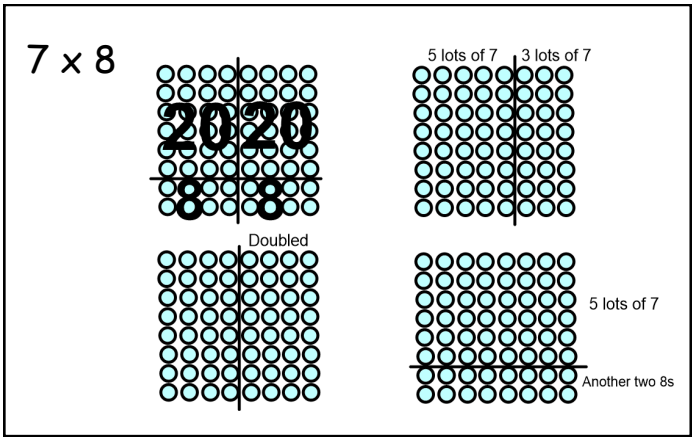
Children will start to look at arrays and relate to real life eg. egg boxes, chocolate boxes, baking trays, wrapping papers etc.

Stage 3



Children will continue to count in multiples. They will be able to model a calculation using a practical array and link to repeated addition. Children should be able to make a variety of arrays and explain what they show. Children will also develop the language of scaling.

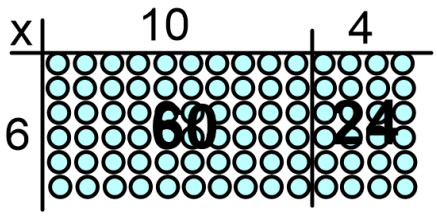
Stage 4



Children will explore arrays for larger numbers, thinking flexibly beyond just repeated addition, They will look for friendly numbers to help them efficiently calculate totals
eg 7 x 8 = (4 x 5)+ (4 x 2) + (4 x 5)+ (4 x 2)

Stage 5

6 x 14

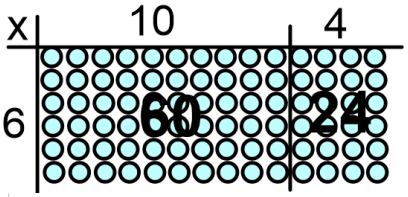


x	10	4
6	60	24

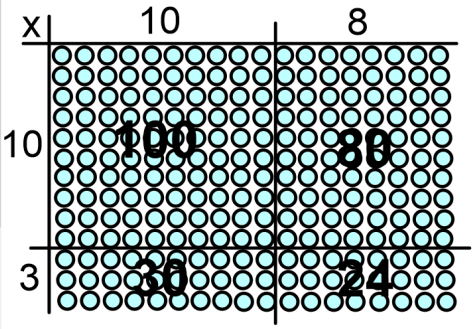
Children will continue to work with arrays, exploring larger numbers, leading into the grid method.

Children start using the grid method when multiplying 2 and 3 digit numbers by 1 digit numbers.

Stage 6



14
6 x
24 (6x4)+
60 (6x10)
84



x	10	8
10	100	80
3	30	24

180
54 +
234
1

Children will now be secure in using the grid method for multiplying by 1 digit numbers and will begin to make links with the expanded method of short multiplication.

Children will also start to explore using the grid method when multiplying by 2 digit numbers.

Stage 7

14
6 x
24 (6x4)+
60 (6x10)
84

14
6 x
84
2

x	10	8
10	100	80
3	30	24

18
13 x
24 (3x8)
30 (3x10)
80 (10x8)
100 (10x10)
234
1

Children will have a good understanding of the expanded short multiplication method and will begin to represent this as compact short multiplication when multiplying by 1 digit numbers.
Children will be secure in using grid method when multiplying by 2 digit numbers and will start to explore the expanded method of long multiplication.

Stage 8

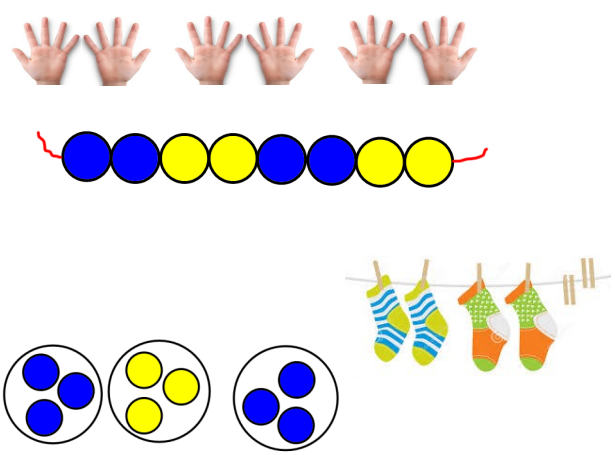
18
13 x
24 (3x8)
30 (3x10)
80 (10x8)
100 (10x10)
234
1

2
18
13 x
54
180 +
234
1

Children will now have a good understanding of the short multiplication method as well as the long multiplication method. They will begin to represent long multiplication more efficiently.

Division

Stage 1



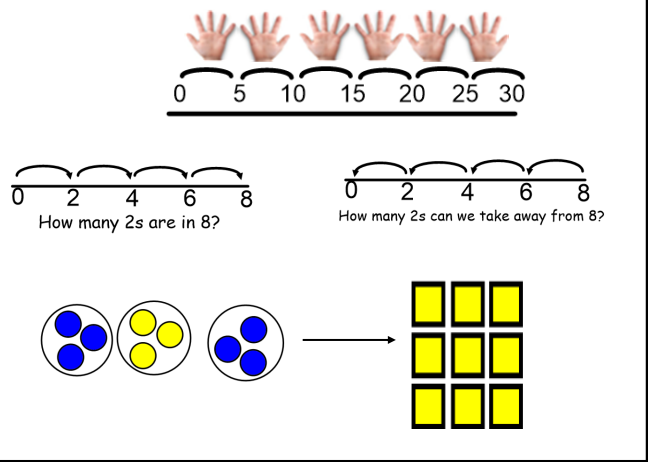
Children will explore the language of sharing. They will experience practical activities in sharing objects between a small number of people with the emphasis on sharing equally.

Alongside this, children will be introduced to grouping objects into equal groups as a representation of division.

They will begin to use the language and representations of halving.

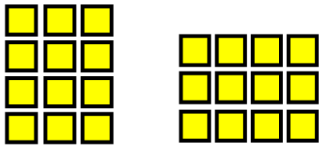
Children will be encouraged to develop ways of recording their findings using pictures.

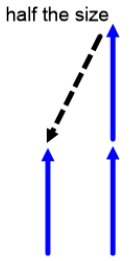
Stage 2



Children will relate the grouping of objects to repeated subtraction and begin to represent this using a numberline and equipment.
They will use their knowledge of counting up in multiples to solve division calculations and recognise that this is the inverse of multiplication.
Children will continue to group and share equally using equipment and will now begin to organise their groups into arrays.
Children will link division with fractions and understand that the fraction line is equivalent to the division sign so a÷b can be written as $\frac{a}{b}$

Stage 3





12 into ____equal groups gives ____in each group.

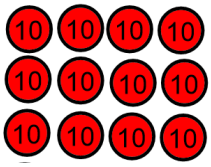
12÷4 = 3

12÷3 = 4

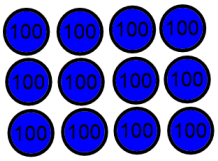
Children will continue to use their knowledge of counting in multiples to support the inverse of multiplication and repeated subtraction. Children will build on their use of arrays to explore division facts. Children will be confident in using the language of scaling.

Stage 4

120÷3=

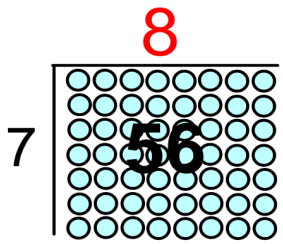


1200÷3=

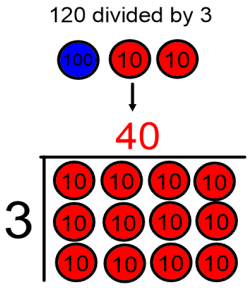


Children will continue to organise groups into arrays, now working with larger numbers by either grouping or sharing. Children will be able to explain all the facts they know about a given array. How many in each group? How many groups?

56÷7



120÷3

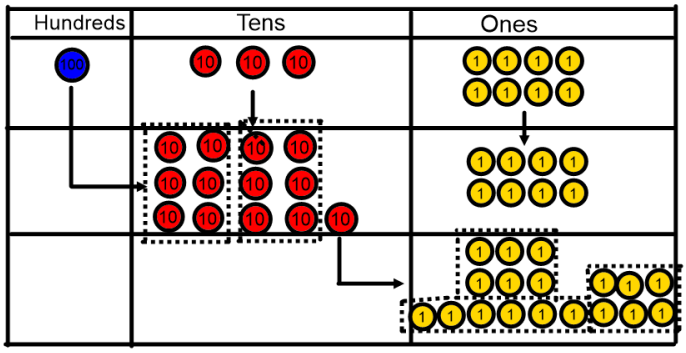


Stage 5

Children will continue to work with arrays, exploring known multiplication and division facts with the use of grid lines to make a link to short division.

Children will begin to use counters within an array using their knowledge of practical exchange where necessary

138÷6



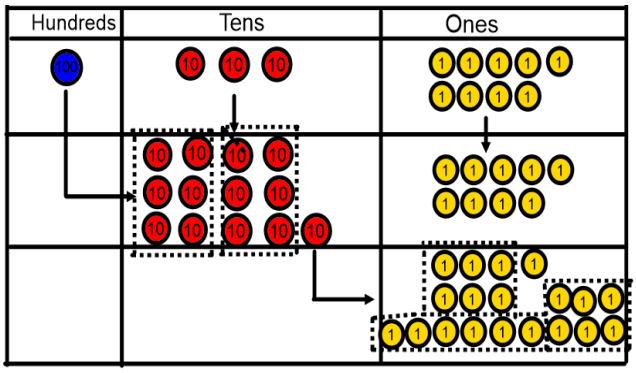
$$6\overline{)138} = 23$$

Stage 6

Children will work with equipment to divide by a single digit divisor using their knowledge of exchange.

Children will be introduced to the notation of short division linking this with the principle of exchange.

139÷6



$$6\overline{)139} = 23_{r1}$$

Stage 7

Children will now begin to use the short division notation for numbers with remainders.

They will begin to explore the use of jottings of friendly numbers to support long division of calculations with 2 digit divisors.

420÷15

1x15=15
2x15=30
4x15=60
8x15=120
10x15=150
20x15=300

$$\begin{array}{r} 28 \\ 15\overline{)420} \\ 300 \quad (20\times15) \\ \hline 120 \\ 120 \quad (8\times15) \\ \hline 0 \end{array}$$

Stage 8

$$\begin{array}{r} 28_{r12} \\ 15\overline{)432} \\ 300 \quad (20\times15) \\ \hline 132 \\ 120 \quad (8\times15) \\ \hline 12 \end{array} \qquad \begin{array}{r} 28_{r12/15} \\ 15\overline{)432} \\ 300 \quad (20\times15) \\ \hline 132 \\ 120 \quad (8\times15) \\ \hline 12 \end{array}$$

Children will be secure in using short division for one digit divisors and long division for two digit divisors. They will be able to interpret remainders as fractions.