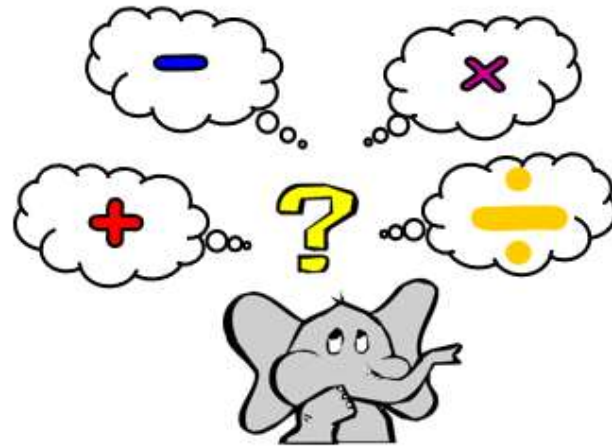


Bonnygate Primary School

Mathematics Calculation Policy February 2024



- The following calculation policy has been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school.
- Age stage expectations:
The calculation policy is organised according to age stage expectations as set out in the National Curriculum 2014 and the method(s) shown for each year group should be modelled to the vast majority of pupils. However, it is vital that pupils are taught according to the pathway that they are currently working at and are showing to have ‘mastered’ a pathway before moving on to the next one. Of course, pupils who are showing to be secure in a skill can be challenged to the next pathway as necessary.
- Choosing a calculation method:
Before pupils opt for a written method they should first consider these steps:

*Can I do it in my head
using a mental strategy?*



*Could I use some
jottings to help me?*



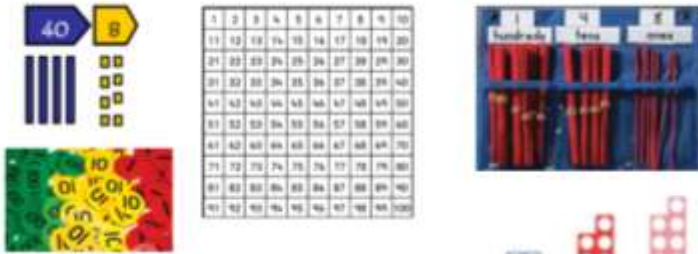
*Should I use a formal written
method to work it out?*

Calculation Guidance Principles

- Develop children’s fluency with basic number facts
- Develop children’s fluency in mental calculation
- Develop children’s understanding of the = symbol
- Teach inequality alongside teaching equality
- Use empty box problems
- Use intelligent practice
- Expose mathematical structure and work systematically
- Move between the concrete and the abstract
- Contextualise the mathematics


ADDITION

Concrete resources:
 100 square
 Number lines
 Bead strings
 Straws
 Dienes
 Place value cards
 Place value dice
 Place value counters
 Numicon



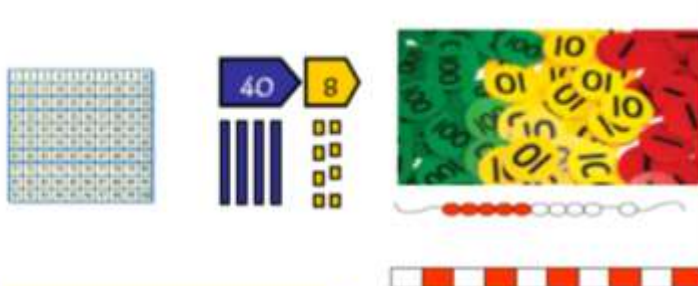
sum addition total
 make + more
 and plus
 add increase
 altogether

$2 + 5 = 7$

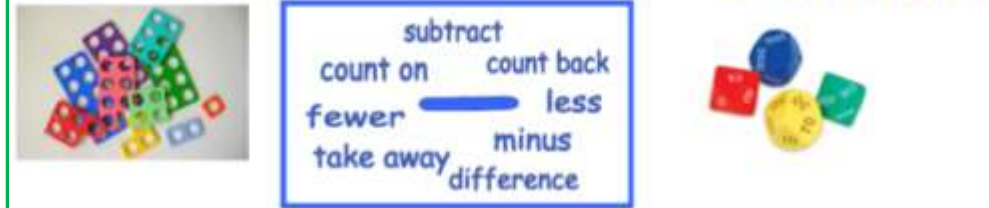


SUBTRACTION

Concrete resources:
 100 square
 Number lines
 Bead strings
 Straws
 Dienes
 Counting stick
 Place value dice
 Place value cards
 Place value counters

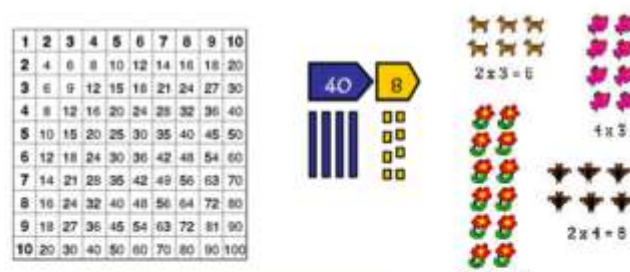


subtract
 count on count back
 fewer — less
 take away minus
 difference




MULTIPLICATION

Concrete resources:
 Place value counters
 Dienes
 Place value charts
 Arrays
 Multiplication squares
 100 square
 Number lines
 Blank number lines
 Counting stick



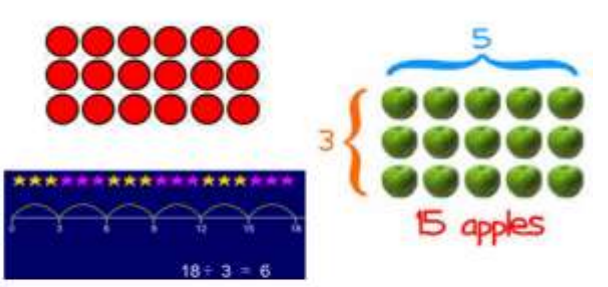
multiplication product
 once, twice, three times
 double groups of
 repeated addition lots of
 array, row, column multiply
 times multiple

$2 \times 3 = 6$
 $4 \times 3 = 12$
 $2 \times 4 = 8$
 $5 \times 2 = 10$



DIVISION

Concrete resources:
 Arrays
 Multiplication squares
 100 square
 Number lines
 Blank number lines
 Counting stick
 Place value apparatus



divided by group
 into lots of into groups of
 divisible — halve
 half remainder factor

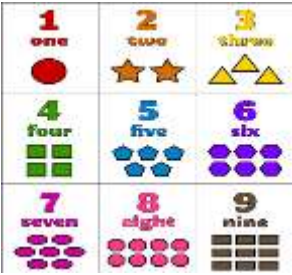
$18 \div 3 = 6$

5
 {
 15 apples

RECEPTION

Addition

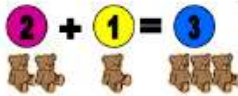
- Count reliably with numbers from 1 to 20 and place them in order.
- Say which number is one more than a given number.
- Using quantities and objects, add two single-digit numbers and count on to find the answer.
- Solve problems including doubling.



Recognise numbers up to 20 and understand the meaning of each number by recognising and knowing their clusters



Count on in ones and say which number is one more than a given number using a number line or number track to 20.



Begin to relate addition to combining two groups of objects using practical resources, role play, stories and songs.

OR ● ● and ● ● makes 5

Know that



counting on is a strategy for addition. Use numbered number lines to 20.

Subtraction

- Count reliably with numbers from 1 to 20, forwards and backwards and place them in order.
- Say which number is one less than a given number.
- Using quantities and objects, subtract two single-digit numbers and count back to find the answer.
- Solve problems including halving.



Say which number is one less than a given number using a number line or number track to 20.

Begin to count backwards in familiar contexts such as number rhymes or stories.

10 Green Bottles sitting on the wall ...



Begin to relate subtraction to 'taking away' using concrete objects and role play.

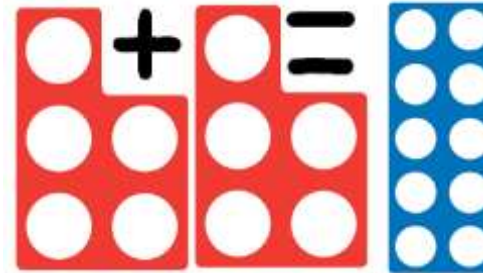
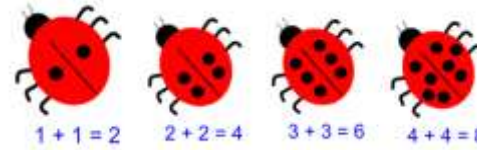
Count backwards along a number line to 'take away'



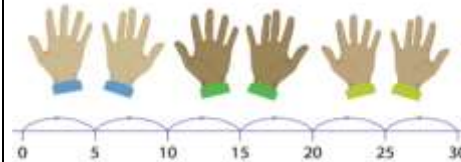
Multiplication

- Solve problems including doubling, halving and sharing.

Use pictorial representations and concrete resources to double numbers to 10.



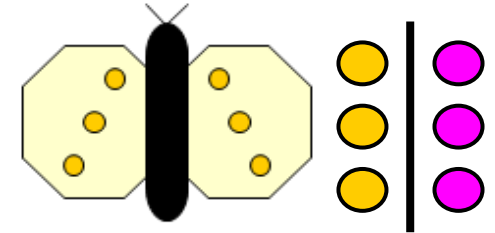
Use concrete sources, role play, stories and songs to begin counting in twos, fives and tens.



Division

- Solve problems including doubling, halving and sharing.

Use pictorial representations and concrete resources to halve numbers to 10.



Begin to share quantities using practical resources, role play, stories and songs.



Role play example:

It is the end of the party and the final two teddies are waiting for their party bags. Provide empty party bags and a small collection of items such as gifts, balloons and slices of cake. Ask the children to share the objects between the two bags.

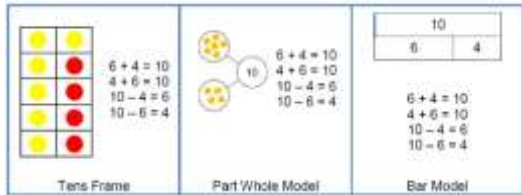
YEAR 1

Addition

- Count to and across 100, forwards beginning with 0 or 1, or from any given number.
- Given a number, identify one more.
- Read, write and interpret mathematical statements involving addition (+) and equals (=) signs.
- Represent and use number bonds and related subtraction facts within 20.
- Add one-digit and two-digit numbers to 20, including zero.
- Solve one-step problems that involve addition using concrete objects and pictorial representations, and missing number problems. Identify and represent numbers using manipulatives and pictorial representations:



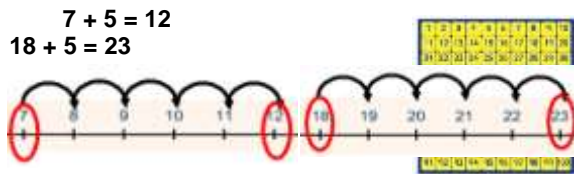
Memorise and reason with number bonds to 10 and 20



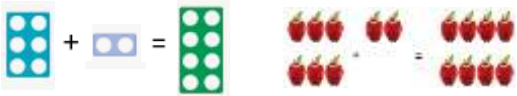
in several forms:

Count on in ones to and across 100 and find one more than a given number:

Use manipulatives and a number line to support the addition of numbers:



Solve one-step problems using concrete objects and pictorial representations:
eg: Eva buys 6 apples and Sam buys 2 apples. How many do they have altogether?



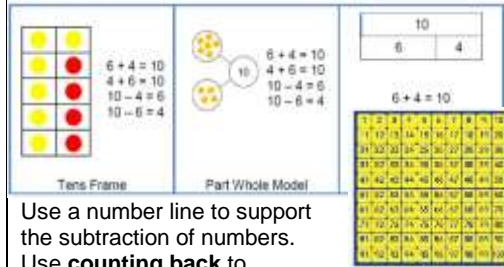
Subtraction

- Say which number is one less than a given number.
- Represent and use number bonds and related subtraction facts within 20.
- Read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs.
- Subtract one-digit and two-digit numbers to 20, including zero.
- Solve one-step problems that involve subtraction using concrete objects and pictorial representations, and missing number problems.

Understand that subtraction is take away, using manipulatives and pictorial representations: Use number bonds and related subtraction facts within 20: Count back in ones and find one less than a given number:

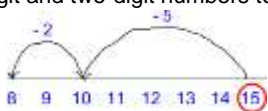
$$16 - \square = 10$$

$$20 - \square = 15$$

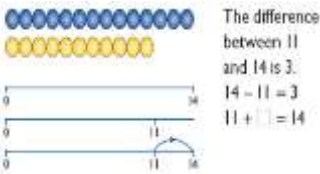


Use a number line to support the subtraction of numbers. Use **counting back** to subtract one-digit and two-digit numbers to 20.

$$15 - 7 = 8$$



Use **counting on** for 'find the difference' or the 'difference between'.



Solve one-step problems using concrete objects and pictorial representations:

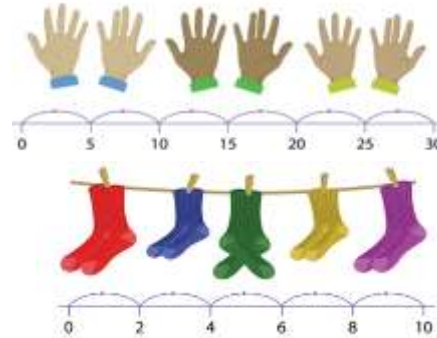


eg: Eva has 6 oranges. She gives 4 to Sam. How many oranges does she have left?

Multiplication

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

Count in twos, fives and tens using practical resources, role play, stories and songs, reinforced with the use of a number line:



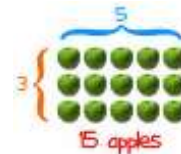
Understand multiplication as repeated addition – use concrete objects to support understanding:



Use pictorial representations:

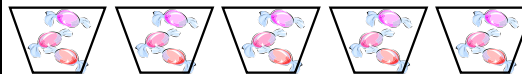


Use arrays:



Solve one-step problems using concrete objects, pictorial representations and arrays:

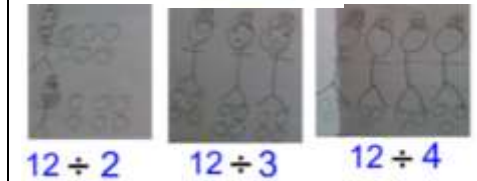
eg: There are 3 sweets in one bag. How many sweets are there in 5 bags?



Division

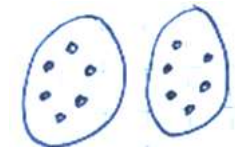
- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Understand division as **sharing** using concrete resources. Pictorial representations of sharing 12 gold coins between 2, 3 and 4 pirates:

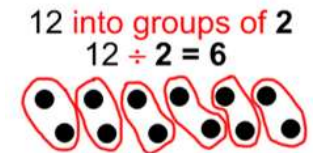


$$12 \text{ shared between } 2 \text{ groups}$$

$$12 \div 2 = 6$$



Begin to understand division as **grouping** using concrete resources:



$$12 \text{ into groups of } 2$$

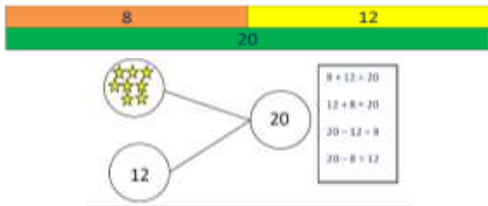
$$12 \div 2 = 6$$

YEAR 2

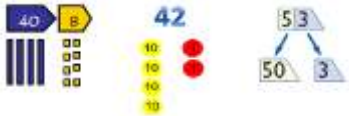
Addition

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts to 100.
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
- Add 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.
- Solve problems with addition including those involving numbers, quantities and measures.

Memorise and reason with number facts to 20 in several forms and show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot.

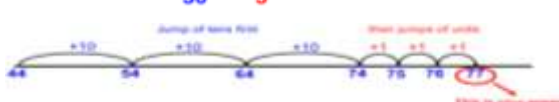
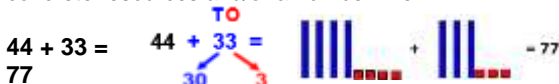


Partition two 2-digit numbers using a variety of models and images.



Add a 2-digit

number and ones and add a 2-digit number and tens. Use partitioning to add two 2-digit numbers using concrete resources and/or a number line:



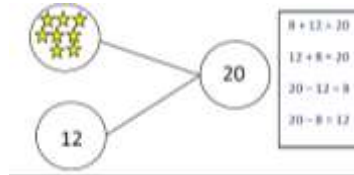
Progressing on to combining jumps when confident:

Subtraction

- Recall and use subtraction facts to 20 fluently, and derive and use related facts to 100.
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
- 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.



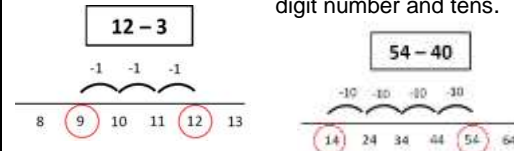
Memorise and reason with number facts to 20 in several forms.



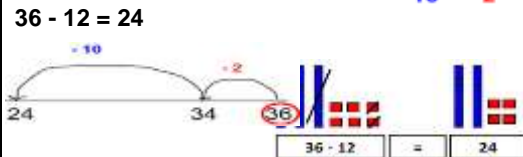
Partition two 2-digit numbers using a variety of models and images.



Subtract a 2-digit number and ones and add a 2-digit number and tens.



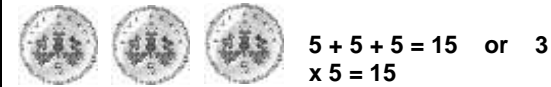
Use partitioning to subtract two 2-digit numbers using concrete resources and/or a number line.



Multiplication

- 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 (x), 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.

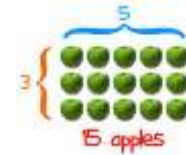
Further develop understanding multiplication as repeated addition.



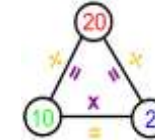
Use pictorial representations:



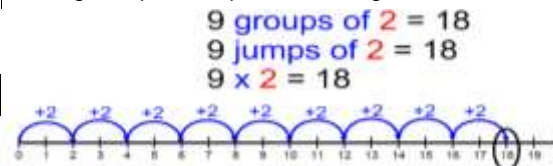
Use arrays:



Recall multiplication and division facts for 2, 5 and 10:



Model and bridge link from repeated addition to solving multiplication problems using a number line.

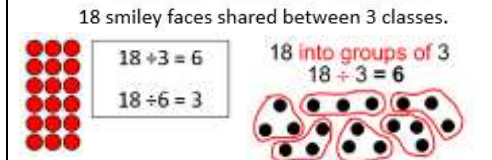


Division

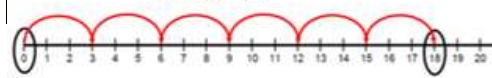
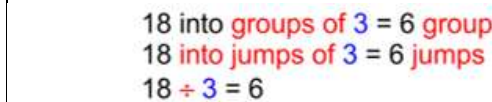
- Recall and use division facts for 2, 5 and 10 multiplication tables.
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
- Find 1/3; 1/4; 2/4; 3/4 of a length, shape, set of objects or quantity

Further develop understanding of difference between **sharing** and **grouping** using concrete resources. Pictorial representations of sharing and grouping:

Reinforce division through the use of arrays:



Model division as grouping on number lines:



Remember to **develop connections between fractions and division** and rephrase this calculation as 1/3 of 18 is the same as 18 ÷ 3 = 6

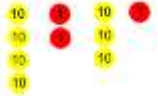
YEAR 3

Addition

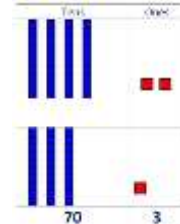
- Find 10 or 100 more than a given number.
- Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).
- Add numbers with up to three digits, using formal written methods of columnar addition.

Use expanded column method with place value resources to support the conceptual understanding of adding numbers up to three digits **with no carrying**.

$42 + 31 = 73$

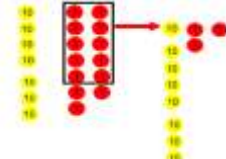
$$\begin{array}{r} 40 + 2 \\ 30 + 1 \\ \hline 70 + 3 \end{array}$$


OR

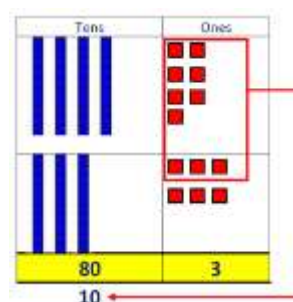


Progress to using the expanded column method with place value resources to support the conceptual understanding of adding numbers up to three digits **with carrying**.

$47 + 36 = 83$

$$\begin{array}{r} 40 + 7 \\ 30 + 6 \\ \hline 80 + 3 \\ 10 \end{array}$$


OR



Extend to using the expanded column method to add three-digit numbers + three-digit numbers **with carrying**.

$367 + 185 = 552$

$$\begin{array}{r} 300 + 60 + 7 \\ 100 + 80 + 5 \\ \hline 500 + 50 + 2 \\ 100 \quad 10 \end{array}$$

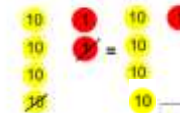
Note: The carried ten or carried hundred is just as important as any other number, therefore, it should be written as clear and as large as any other number and placed at the **bottom** of the column in which it is to be added.

Subtraction

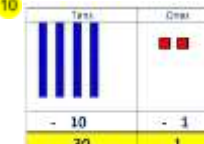
- Find 10 or 100 less than a given number.
- Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).
- Subtract numbers with up to three digits, using formal written methods of column subtraction.
- Subtract numbers mentally, including:
 - A three-digit number and ones
 - A three-digit number and tens
 - A three-digit number and hundreds.

Use expanded column method with place value resources to support the conceptual understanding of subtracting numbers with up to three digits **with no exchanging**.

$42 - 11 = 31$


$$\begin{array}{r} 40 + 2 \\ - 10 + 1 \\ \hline 30 + 1 \end{array}$$


OR

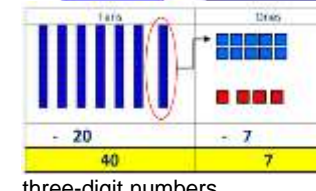


Progress to using the expanded column method with place value resources to support the conceptual understanding of subtracting numbers with up to three digits **with exchanging tens and/or hundreds**. In this example to subtract 7 ones from 4 ones we need to **exchange** a ten for ten ones. We now can subtract 7 ones from 14 ones.

$70 - 27 = 43$

$$\begin{array}{r} 60 + 14 \\ - 20 + 7 \\ \hline 40 + 7 \end{array}$$


OR



Extend to using the expanded column method to subtract three-digit numbers from three-digit numbers.

$537 - 254 = 283$

Note: The exchanged ten or hundred is just as important as any other number, therefore, it should be written as clear and as large as any other number and placed at the **top** of the column which has been adjusted.

Multiplication

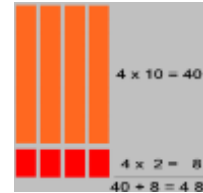
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
- Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal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

Develop recall of multiplication facts (alongside inverse of the corresponding division facts).

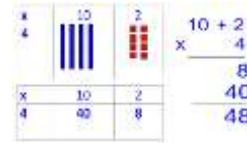
x	3	4	8
5			
6			
4			

x	4	?	?
?	8	6	10
6	24	18	30
?	32	24	40

Use concrete resources to develop conceptual understanding of the compact method introduced in Year 4: $12 \times 4 = 48$



OR



Solve one-step multiplication problems involving scaling and correspondence problems in which n objects are connected to m objects:

eg: *The yellow ribbon is 4 times as long as the red ribbon. What is its length?*



Division

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
- Write and calculate mathematical statements for 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 division including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Limit numbers to NO remainders in the answer OR carried (each digit must be a multiple of the divisor).

$3 \overline{)96}$

Limit numbers to NO remainders in the final answer, but with remainders occurring within the calculation.

$4 \overline{)732}$

Extend to 3-digit number first where the divisor can go into the first number and then progress to when the divisor cannot go into the first number.

$5 \overline{)1835}$ $4 \overline{)2182}$

Remember to develop connections between fractions and division and rephrase these calculations as $\frac{1}{3}$ of 96, $\frac{1}{4}$ of 72, $\frac{1}{5}$ of 872 and $\frac{1}{5}$ of 185. Note: Year 3 fraction objective - *Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.*

YEAR 4

Addition

- Find 1000 more than a given number.
- Add numbers with up to four digits, using the formal written methods of columnar addition where appropriate.
- Solve addition two-step problems in contexts, deciding which operations and methods to use and why.

Build on learning from Year 3 and model how expanded method links to compact column addition method.

$$\begin{array}{r}
 40 + 7 \\
 30 + 6 \\
 80 + 3 \\
 10
 \end{array}
 \Rightarrow
 \begin{array}{r}
 47 \\
 +36 \\
 83 \\
 1
 \end{array}
 \qquad
 \begin{array}{r}
 300 + 60 + 7 \\
 100 + 80 + 5 \\
 500 + 50 + 2 \\
 100 \quad 10
 \end{array}
 \Rightarrow
 \begin{array}{r}
 367 \\
 +185 \\
 552 \\
 11
 \end{array}$$

Note: The carried ten or carried hundred is just as important as any other number, therefore, it should be written as clear and as large as any other number, and placed at the **bottom** of the column in which it is to be added.

By the end of year 4, pupils should be adding numbers up to 4 digits using compact column addition method.

$$\begin{array}{r}
 5271 \\
 +2357 \\
 \hline
 7628 \\
 1
 \end{array}$$

Children use formal written methods **down** the page, setting out calculation sums neatly and working accurately. Addition sign on the left of the problem, making sure that they have the value correctly lined up by the decimal place.

Extend to decimals in the case of money.

Continue using a range of equations with appropriate larger numbers.

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. Add fractions with the same denominator within one whole, eg:

$$\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$$

Subtraction

- Find 1000 less than a given number.
- Subtract numbers with up to four digits, using the formal written methods of columnar subtraction where appropriate.
- Solve subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Build on learning from Year 3 and model how expanded method links to compact column subtraction method.

$$\begin{array}{r}
 400 + 130 \\
 500 + 30 + 7 \\
 -200 + 50 + 4 \\
 200 + 80 + 3
 \end{array}
 \Rightarrow
 \begin{array}{r}
 4 \\
 537 \\
 -254 \\
 \hline
 283
 \end{array}$$

$$\begin{array}{r}
 60 + 14 \\
 70 + 4 \\
 -20 + 7 \\
 40 + 7
 \end{array}
 \Rightarrow
 \begin{array}{r}
 6 \\
 74 \\
 -27 \\
 \hline
 47
 \end{array}$$

By the end of year 4, pupils should be subtracting numbers up to 4 digits using compact column subtraction method.

$$\begin{array}{r}
 784^{31}2 \\
 -1829 \\
 \hline
 6013
 \end{array}$$

Note: The exchanged ten or hundred is just as important as any other number, therefore, it should be written as clear and as large as any other number, and placed at the **top** of the column which has been adjusted.

Multiplication

- 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: 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.

Develop recall of multiplication facts (alongside the inverse of the corresponding division facts).

Build on learning from Year 3 and model how grid method and/or expanded method links to compact short multiplication.

x	30	6
4		

$$\begin{array}{r}
 30 + 6 \\
 \times 4 \\
 \hline
 24 \quad 24 \\
 + 120 \\
 \hline
 144
 \end{array}$$

Use knowledge of times tables to solve scaling problems.

eg: *Susie wants to bake 12 cupcakes for her friends. The ingredients given are for four cupcakes. How much flour will she need?*



2 eggs
150g flour
180g sugar

Cupcakes	Flour
4	150g
12	450g

Division

There isn't a statutory objective for division. However, Year 4 statutory multiplication objectives are to:

- Recall multiplication and division facts for multiplication tables up to 12×12 and
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout, so in Year 4 we will build on the connections between multiplication and division.

Consolidate learning and understanding from Year 3:

Limit numbers to NO remainders in the answer OR carried (each digit must be a multiple of the divisor).

$$\begin{array}{r}
 32 \\
 3 \overline{)96}
 \end{array}$$

Limit numbers to NO remainders in the final answer, but with remainders occurring within the calculation.

$$\begin{array}{r}
 18 \\
 4 \overline{)72}
 \end{array}$$

Extend to 3-digit number first where the divisor can go into the first number and then progress to when the divisor cannot go into the first number.

$$\begin{array}{r}
 218 \\
 4 \overline{)872}
 \end{array}
 \qquad
 \begin{array}{r}
 037 \\
 5 \overline{)185}
 \end{array}$$

Remember to develop connections between fractions and division and rephrase these calculations as $\frac{1}{3}$ of 96, $\frac{1}{4}$ of 72, $\frac{1}{4}$ of 872 and $\frac{1}{5}$ of 185. Note: Year 4 fraction objective - *Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.*

YEAR 5

Addition

- Add whole numbers with more than 4 digits using formal written methods of columnar addition.
- Add numbers mentally, with increasingly large numbers.
- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why.
- Solve problems involving numbers up to three decimal places.

In year 5 and 6 pupils should be adding numbers using compact column addition method. **Note:** The carried ten, hundred or thousand is just as important as any other number, therefore, it should be written as clear and as large as any other number, and placed at the **bottom** of the column in which it is to be added.

$$\begin{array}{r} 46892 \\ + 32758 \\ \hline 79650 \\ 111 \end{array}$$

When adding decimals, it is essential that the decimal point does not move and kept in line.

Where necessary, a zero should be added as a **place holder**.

$$12.5 + 23.7 \qquad 34.5 + 27.43$$

$$\begin{array}{r} 12.5 \\ + 23.7 \\ \hline 36.2 \\ 1 \end{array}$$

$$\begin{array}{r} 34.50 \\ + 27.43 \\ \hline 61.93 \\ 1 \end{array}$$

Subtraction

- Subtract whole numbers with more than 4 digits using formal written methods of columnar subtraction.
- Subtract numbers mentally, with increasingly large numbers.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Solve problems involving numbers up to three decimal places.

In year 5 and 6 pupils should be subtracting numbers using compact column subtraction method.

Note: The exchanged ten or hundred is just as important as any other number. Therefore, it should be written as clear and as large as any other number, and placed at the **top** of the column which has been adjusted.

$$\begin{array}{r} 8 \quad 7 \\ 9 \overset{1}{6} 7 8 \overset{1}{3} \\ - \\ \hline 5 \ 8 \ 7 \ 3 \ 5 \\ 3 \ 8 \ 0 \ 4 \ 8 \end{array}$$

When subtracting decimals, it is essential that the decimal point does not move and kept in line.

Where necessary, a zero should be added as a **place holder**.

$$\begin{array}{r} 4 \\ 5 \overset{1}{3} 7 \\ - 2.54 \\ \hline 2.83 \end{array}$$

$$\begin{array}{r} 7 \overset{1}{0} 5 \cdot 34 \overset{1}{1} 9 \text{ kg} \\ - 36 \cdot 08 \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array}$$

Multiplication

- 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 whole numbers and those involving decimals by 10, 100 and 1000.

Build on learning from Year 4 and use concrete resources if needed to multiply numbers up to 4 digits by **one digit** using compact short multiplication.

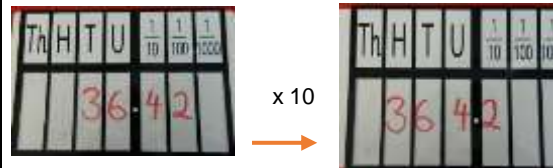
$$\begin{array}{r} 643 \times 8 \\ \quad \overset{3}{2} \\ 643 \\ \times 8 \\ \hline 5144 \end{array}$$

Reinforce the connection between the grid method to multiply numbers **up to 4 digits by two-digit** using long multiplication.

21				
11				
643				
x 54				
2572				
+32150				
34722				

	x	600	40	3
50		30,000	2,000	150
4		2,400	160	12

To multiply by 10, 100, 1000, children should use place value charts to show that the digit moves a column(s) to the left. The value of the digit is increasing by 10, 100 or 1000 times.



Division

- 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.

Further secure pupils' understanding of compact short division.

$$218 \div 8 =$$

$$\begin{array}{r} 27 \text{ r } 2 \\ 8 \overline{) 218} \end{array}$$

Extend to expressing results in different ways according to the context, including with remainders as fractions, as decimals or by rounding. For example:

- Whole number remainder = $27 \text{ r } 2$
- Fraction remainder = $27 \frac{2}{8} = 27 \frac{1}{4}$
- Decimal remainder = $27 \frac{1}{4} = 27 \frac{25}{100}$

YEAR 6

Addition

- Add whole numbers with more than 4 digits using formal written methods of columnar addition.
- Add numbers mentally, with increasingly large numbers.
- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why.
- Solve problems involving numbers up to three decimal places.

In addition to the Year 5 statutory requirements, Year 6 pupils are expected to solve more complex addition and subtraction problems.

In year 5 and 6 pupils should be adding numbers using compact column addition method. **Note:** The carried ten, hundred or thousand is just as important as any other number, therefore, it should be written as clear and as large as any other number, and placed at the **bottom** of the column in which it is to be added.

$$\begin{array}{r} 46892 \\ + 32758 \\ \hline 79650 \\ 111 \end{array}$$

When adding decimals, it is essential that the decimal point does not move and kept in line. Where necessary, a zero should be added as a **place holder**.

$$12.5 + 23.7 \qquad 34.5 + 27.43$$

$$\begin{array}{r} 12.5 \\ + 23.7 \\ \hline 36.2 \\ 1 \end{array}$$

$$\begin{array}{r} 34.50 \\ + 27.43 \\ \hline 61.93 \\ 1 \end{array}$$

Subtraction

- Subtract whole numbers with more than 4 digits using formal written methods of columnar subtraction.
- Subtract numbers mentally, with increasingly large numbers.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Solve problems involving numbers up to three decimal places.

In addition to the Year 5 statutory requirements, Year 6 pupils are expected to solve more complex addition and subtraction problems.

In year 5 and 6 pupils should be subtracting numbers using compact column subtraction method.

Note: The exchanged ten or hundred is just as important as any other number. Therefore, it should be written as clear and as large as any other number, and placed at the **top** of the column which has been adjusted.

$$\begin{array}{r} 8 \quad 7 \\ 9 \overset{1}{6} 7 8 \overset{1}{3} \\ - 5 8 7 3 5 \\ \hline 3 8 0 4 8 \end{array}$$

When subtracting decimals, it is essential that the decimal point does not move and kept in line. Where necessary, a zero should be added as a **place holder**.

$$\begin{array}{r} 4 \quad 1 \\ 5 \overset{1}{.} 3 7 \\ - 2.54 \\ \hline 2.83 \end{array}$$

	10	5	.	3	1	9	kg
-	3	6	.	0	8		kg
	6	9	.	3	3	9	kg

Multiplication

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- Multiply one-digit numbers with up to two decimal places by whole numbers.

Build on learning from Year 5, multiplying numbers using compact short multiplication and long division.

$$\begin{array}{r} 643 \times 8 \\ \hline 5144 \end{array}$$

$$\begin{array}{r} 21 \\ 11 \\ 643 \\ \times 54 \\ \hline 2572 \\ +32150 \\ \hline 34722 \end{array}$$

$$\begin{array}{r} 23 \\ 7.68 \\ \times 4 \\ \hline 30.72 \end{array}$$

Use compact short multiplication to multiply a decimal number by a whole number.

Division

- 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.

Continue to use compact short division to divide numbers up to 4 digits by a 1-digit whole number.

$$8 \overline{) 2158} \quad 27 \text{ r } 2$$

- Whole number remainder = 27 r 2
- Fraction remainder = $27 \frac{2}{8} = 27 \frac{1}{4}$
- Decimal remainder = $27 \frac{1}{4} = 27 \frac{25}{100} = 27.25$

Use long division to divide numbers up to 4 digits by a 2-digit whole number.

$$24 \overline{) 588} \quad 24 \text{ r } 12$$

$$\begin{array}{r} 24 \\ 24 \overline{) 588} \\ - 48 \\ \hline 108 \\ - 96 \\ \hline 12 \end{array}$$

Find the multiples of the divisor by partitioning, eg:

	24	
20	+	4 = 24
40	+	8 = 48
60	+	12 = 72
80	+	16 = 96
100	+	20 = 120
120	+	24 = 144
140	+	28 = 168
160	+	32 = 192
180	+	36 = 216