

Year 2 - Maths

Number - Number and Place Value

Pupils should be taught to:

- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems.

Number - Addition and Subtraction

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.

Number - Multiplication and Division

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 (\times), division (\div) 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.

Number - Fractions

Pupils should be taught to:

- recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

Measurement

Pupils should be taught to:

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}\text{C}$); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins that equal the same amounts of money
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day.

Geometry - Properties of shapes

Pupils should be taught to:

- identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]

- compare and sort common 2-D and 3-D shapes and everyday objects.

Geometry – Position and Direction

Pupils should be taught to:

- order and arrange combinations of mathematical objects in patterns and sequences
- use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).

Statistics

Pupils should be taught to:

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data.

Note: Please see appendices for Year 2 Termly Instant Recall Facts

Year 2 Calculations

Addition

Key Instant Recall Facts

In preparation for secure methods of calculation, children will develop instant recall of the following facts during Year 2:

- Number bonds to 20
- Doubles and halves of numbers to 20

Missing number Problems

$14 + 5 = 10 + \blacksquare$

$32 + \blacksquare + \blacksquare = 100$

$35 = 1 + \blacksquare + 5$

It is valuable to use a range of representations (also see Y1). Continue to use number lines to develop understanding of following concepts.

Counting on in tens and ones

The first written method for adding is to count on using a **number line** (see **Year1**).

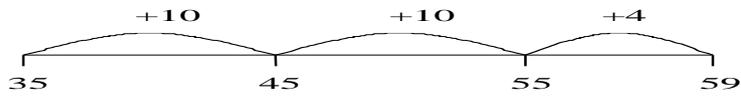
Children should be encouraged to begin with the bigger number, this links to putting the largest number in your head and counting on from there.

Remind the children that addition can be calculated with the numbers in any order.

$24 + 35 =$

Turn the calculation round so that the bigger number is first ($35 + 24 =$)

Draw a blank number line with 35 at the beginning.



Say: add the 2 tens, $35 + 10 = 45$

$$45 + 10 = 55$$

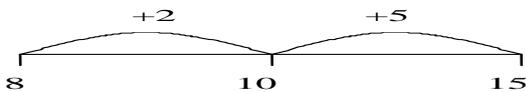
add on the 4 units $55 + 4 = 59$

Remind the children that the answer is at the bottom of the line and needs to be written after the equals sign in the written calculation.

Partitioning and bridging through 10

The steps in addition often bridge through a multiple of 10 e.g. children should be able to partition the 7 to relate adding the 2 and then the 5.

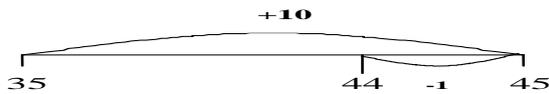
$$8 + 7 = 15$$



Adding 9 or 11 by adding 10 and adjusting by 1

e.g add 9 by adding 10 and adjusting by 1

$$35 + 9 = 44$$



Towards a written method

From counting on using a number line, this then leads on to the method of **partitioning** the numbers into parts (tens and units), adding the parts, and then recombining to find the total.

e.g. $45 + 13$ Partition the numbers into tens and units:

$$\begin{array}{r} 40 + 5 \\ + 10 + 3 \\ \hline 50 + 8 = 58 \end{array}$$

We say: Add the units together: $5 + 3 = 8$

Add the tens together: $40 + 10 = 50$

Recombine the numbers to give the total:

$$50 + 8 = 58$$

Use diennes apparatus to provide a model and image to support in the explanation of this written method.

Year 2 Calculations

Subtraction

Key Instant Recall Facts

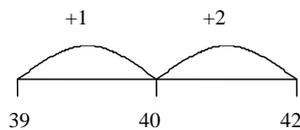
In preparation for secure methods of calculation, children will develop instant recall of the following facts during Year 2:

- Number bonds to 20
- Doubles and halves of numbers to 20

Missing number problems e.g.

$$52 - 8 = \blacksquare \quad \blacksquare - 20 = 25 \quad 22 = \blacksquare - 21 \quad 6 + \blacksquare + 3 = 11$$

It is valuable to use a range of representations (also see Y1). Continue to use number lines to model take-away and difference. e.g.

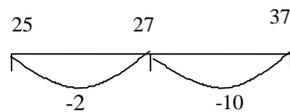


42 - 39

Difference between 42 and 39.

How many more to go from 39 to 42?

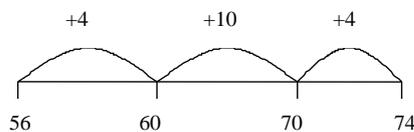
Bridging 10- using number bonds of 10 knowledge.



Using counting back in multiples of 10 knowledge.

The link between the two may be supported with an example such as the one below, subtracting a 2-digit number from a 2-digit number using the more refined method of **counting on**.

e.g. There are 74 sweets in a jar, 56 are eaten by the children. How many



sweets are left in the jar?

$$74 - 56 = 18$$

We say: Draw a number line with the smaller number at the beginning and the larger number at the end.

Count on to the next multiple of 10 after 56 (60).

Draw the jump on the number line and write +4 above the jump.

Count on to the multiple of 10 below 74 (70).

Draw the jump on the number line and write +10 above the jump.

Count on to 74 (+4)

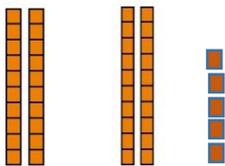
Total the numbers at the top of the jumps ($4+10+4=18$)

Towards a written method

Recording subtraction and subtraction in expanded columns can support understanding of the quantity aspect for place value and prepare for efficient written methods with larger numbers. In order to gain secure mathematical understanding, the children need to work with practical apparatus before they move on to more traditional methods of subtraction. e.g.

$$45 - 20 =$$

$$45 - 24 =$$



Year 2 Calculations

Multiplication

Key Instant Recall Facts

In preparation for secure methods of calculation, children will develop instant recall of the following facts during Year 2:

- Multiplication facts for 2x, 10x and 5x tables
- Doubles to 20

Learning and recalling **multiplication tables** begins in KS1.

It is essential that all children know their multiplication tables and associated facts thoroughly.

e.g. I know that $6 \times 5 = 30$ so I know that $5 \times 6 = 30$

$$60 \times 5 = 300$$

$$50 \times 6 = 300$$

$$30 \div 5 = 6$$

$$30 \div 6 = 5 \text{ etc}$$

Tables are learned first by rote and then randomly.

Children also learn the corresponding division facts for multiplication tables.

Children learn up to the twelfth multiple of each multiplication table, up to and including the twelve times table.

Y1	Count on & back in 2s, 5s & 10s										
	Know by heart & know corresponding division facts										
	2x	3x	4x	5x	6x	7x	8x	9x	10x	11x	12x
Y2	✓			✓					✓		
Y3	✓	✓	✓	✓			✓		✓		
Y4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Y5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Y6	Consolidate all multiplication tables and associated facts										

Activities in the classroom will build time tables practice. Also extra practice for homework and weekly testing will consolidate instant recall.

Missing number problems

- Expressing multiplication as a number sentence using x
- Using their understanding of inverse and practical resources to solve missing number problems:

$$7 \times 2 =$$

$$\blacksquare = 2 \times 7$$

$$7 \times \blacksquare =$$

$$14 = \blacksquare \times 7$$

$$\blacksquare \times 2 = 14$$

$$14 = 2 \times \blacksquare$$

$$\square \times \bullet = 14$$

$$14 = \square \times \bullet$$

Mental methods

- Develop understanding of multiplication using array and number lines (see Year 1). Include multiplications not in the 2,5, or 10 times tables.
- Begin to develop understanding of multiplication as scaling (3 times bigger/taller)
- Doubling numbers up to 10+10
- Using known doubles to work out double 2 digit numbers (double 15 = double 10 + double 5)

- A strategy to help children learn multiplication tables facts from counting is to say or show the child a multiplication fact such as: $6 \times 2 =$

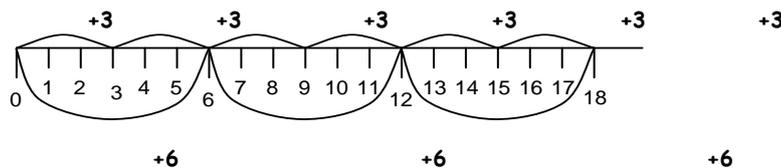
Ask the child to put up six fingers and count each of the six fingers in twos. Six lots of 2 is 12.

Also with $7 \times 10 =$

Ask the child to put up seven fingers and count each of the fingers in tens. Seven lots of 10 is 70.

It is important for children to know that 10×7 will give the same answer as 7×10 , let them show this with their fingers.

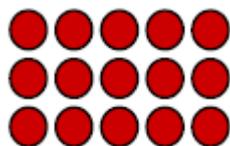
repeated addition



The top line shows 6 jumps of 3.

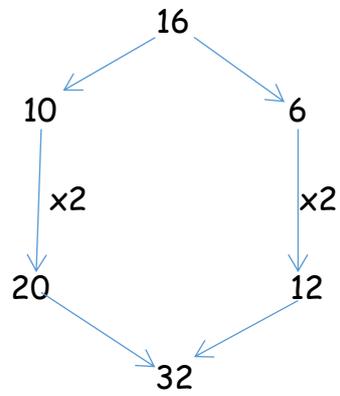
The bottom line shows 3 jumps of 6.

array $3 \times 5 = 15$ or $5 \times 3 = 15$



Towards written methods

Use jottings to develop an understanding of doubling 2 digit numbers.



Year 2 Calculations

Division

Key Instant Recall Facts

In preparation for secure methods of calculation, children will develop instant recall of the following facts during Year 2:

- Division facts $\div 2$, $\div 5$, $\div 10$

\div = signs and missing numbers

$$6 \div 2 = \square$$

$$6 \div \square = 3$$

$$\square \div 2 = 3$$

$$\square \div \triangle = 3$$

$$\square = 6 \div 2$$

$$3 = 6 \div \square$$

$$3 = \square \div 2$$

$$3 = \square \div \triangle$$

Know and understand sharing and grouping ~ introducing the children to the \div sign.

Children should continue to use grouping and sharing for division using practical apparatus, arrays and pictorial representations.

Support children to understand how multiplication and division are inverse. Look at an array ~ what do you see?