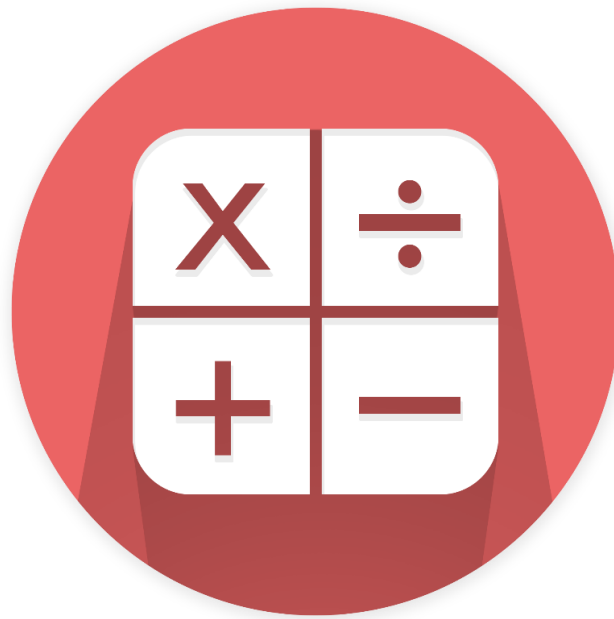




Year 2 Mathematics

Arithmetic Methods



This booklet has been prepared to provide parents and carers with the methods of calculation that pupils need to be confident with to meet the requirements of the Year 2 curriculum.

This booklet has been prepared to provide parents and carers with the methods of calculation that pupils need to be confident with in order to meet the end of year requirements of the Year 2 Curriculum.

Recall and use multiplication and division facts for
2, 5 and 10 multiplication tables
(with 3 times table facts as a challenge).

Table of Contents

Written Methods for Addition.....	3, 4 & 5
Written Methods for Subtraction	6 & 7
Written Methods for Multiplication.....	8 & 9
Written Methods for Division.....	10 & 11
Fractions.....	11 & 12
Comparing and Ordering Unit Fractions.....	13
Equivalent Fractions.....	124
Finding Fractions of Amounts.....	155

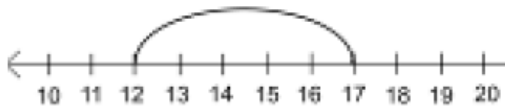
Written Methods for Addition

The answer to an addition question is called the **sum**.

$$24 + 35$$

Method 1: Counting on (two-digit add one-digit)

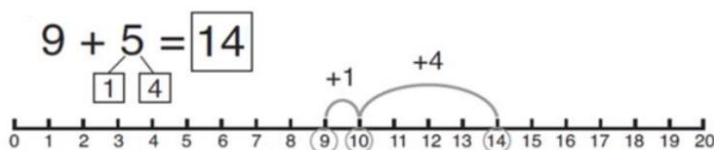
$$12 + 5 = 17$$



Step 1: When given a number line, find the biggest number and count on in ones to find the answer.

N.B. By the end of Year 2, the expectation is that children will place the larger number in their head and count on the smaller number to find their answer.

Method 2: Adjusting (first to make 10 or a near ten)



Step 1: When adding a number that is near to a multiple of ten, find the largest number on the number line.

Step 2: Count up to the multiple of ten and then see what is left of your second number. Add the rest on in ones e.g. For $69 + 6$, we would encourage the children to do $69 + 1$, and then add on the remaining five.

Step 3: Write your answer.

Step 4: Check your answer.

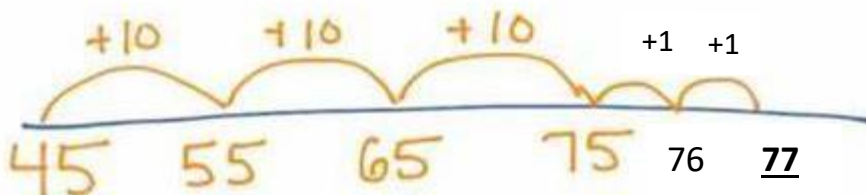
N.B. *By the end of Year 2, the children should be able to do the calculation above mentally. They should be able to add two-digit and one-digit numbers mentally using adjusting where appropriate.*

Method 3: Counting on (two-digit add two-digit)

$$45 + 32 = 77$$

Open Number Line

$$45 + 32 = \underline{77}$$



Step 1: When adding 2 two-digit numbers on a blank number line, put the largest number at the start and then partition the second number into tens and ones.

Step 2: Add your leap/s of tens, and then your ones.

Step 3: Write your answer.

Step 4: Check your answer.

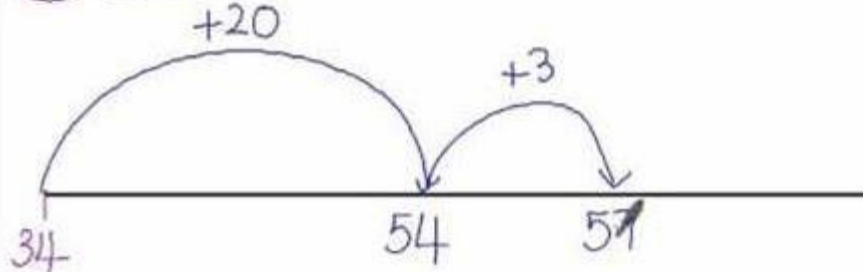
N.B. Some children may, by the end of the year, move on to adding the tens and/or ones in one leap. See the example below.

Using a blank number line

(adding on all the tens, then adding all the units on in one step)

$$\textcircled{34} + 23 =$$

$$\begin{array}{r} 23 \\ \downarrow \downarrow \\ 20 \ 3 \end{array}$$



Method 4: Adding three single digits

- Step 1: When given three single digit numbers to add, we would encourage the children to firstly try and spot any doubles, near doubles or bonds to ten that may help them to add quickly.
- Step 2: Once the three numbers have been combined to leave just two numbers, these can be added using the number line method above.

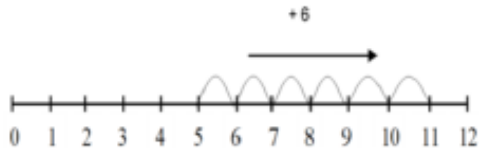
Written Methods for Subtraction

The answer to a subtraction question is called the **difference**.

$$24 - 15$$

Method 1: Counting on using a number line

$$11 - 5 = 6$$



- Step 1: When given a number line, find the **smaller number** and count on up to the **larger number**.
- Step 2: Count up your **hops/jumps**.
- Step 3: Write your answer.
- Step 4: Check your answer.

Method 2: Counting on along a blank number line

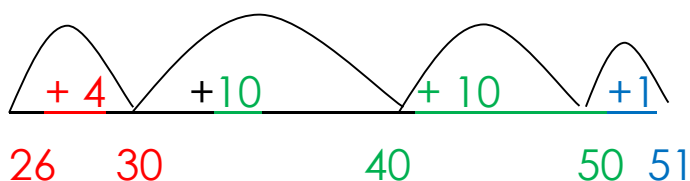
$$51 - 26 = 25$$

- Step 1: Place the **smaller number** at the start of the number line and the **larger number** at the end.

26

51

- Step 2: **Count on in ones from the smaller number to the next multiple of ten**, then continue counting in multiples of ten until no more tens can be counted. Complete the counting along the line in ones until you reach your larger number.



Step 3: Total the numbers in the “hops” to find the answer.

$$10 + 10 + 1 + 4 = 25$$

Quick mental recall of number bonds to 10, 20 and 100 are essential for Year 2. Children should be able to recall addition and subtraction for these facts fluently.

$$9 + 1 = 10 \quad \text{so} \quad 10 - 9 = 1 \text{ etc...}$$

$$19 + 1 = 20 \quad \text{so} \quad 20 - 19 = 1 \text{ etc...}$$

$$6 + 4 = 10 \quad \text{so} \quad 60 + 40 = 100 \text{ etc...}$$

$$\text{If } 70 + 30 = 100 \text{ then } 100 - 70 = 30 \text{ etc...}$$

Written Methods for Multiplication

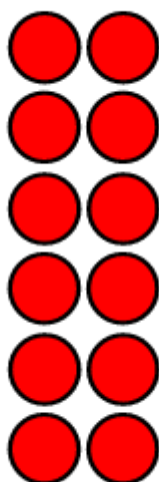
The answer to a multiplication question is called the **product**.

$$2 \times 6 = 12$$

Method 1: Solve multiplication number sentences using arrays

Step 1: Children read the multiplication symbol as 'lots of' or 'groups of'

Step 2: They use manipulatives to form an array.



Step 3: Then count up the counters or cubes and write the answer (*the children should be able to count in multiples of 2, 5 or 10*).

Step 4: Check the answer.

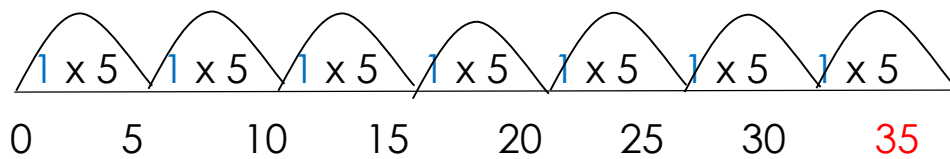
Method 2: Counting in equal groups along a number line

$$7 \times 5 = 35$$

Step 1: Begin the number line at zero and count along the blank number line in equal groups, using the simplest multiple (in this example: 5).



Step 2: Continue to count along the number line until the correct number of groups has been counted (in this example: 7)



Step 3: **Write the answer.** Check the answer.

Method 2: Multiplying a two-digit and one-digit number using partitioning and recombining

$$14 \times 3$$

Step 1: Partition the larger number, into tens and ones.

$$\begin{array}{r} 14 \times 3 \\ \swarrow \searrow \\ 10 \quad 4 \end{array}$$

Step 2: Multiply each of the parts of the number that has been partitioned.

$$10 \times 3 = 30$$

$$4 \times 3 = 12$$

Step 3: Recombine the answers to each of the calculations in Step 2.

$$30 + 12 = 42$$

Step 4: Complete the written calculation.

$$14 \times 3 = 42$$

N.B. *A written method for this is not essential in Year 2. The children may choose to calculate mentally by counting up or work it out by drawing a picture. Both are acceptable on the SATS test.*

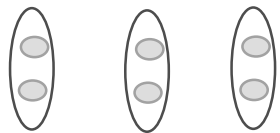
Written Methods for Division

Method 1: Sharing using a pictorial representation

$$6 \div 3 = 2$$

Step 1: The children will interpret the divide symbol as 'share'. This will help them to use a concrete method and physically share out 6 blocks or cubes between two groups.

Step 2: When the teacher feels the child is ready, they will move from a concrete approach to a pictorial one. The child will draw **two groups and share out six dots equally between them.**



Step 3: They will then count how many dots there are in each group and write this as the answer.

Step 4: Check the answer.

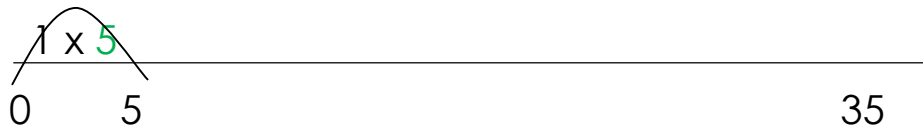
Method 2: Counting in equal groups along a number line

$$35 \div 5 = 7$$

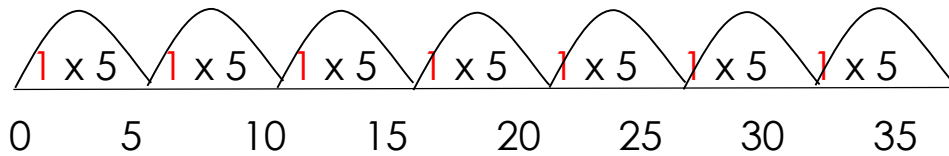
Step 1: Begin the number line at zero and label the end with the number that is being divided (in this example: 35)



Step 2: Count along the number line in equal groups, using the number that we are dividing by (in this example: 5).



Step 3: Continue to count in equal groups until reaching the number that is being divided (at the end of the number line).



Step 4: Total the number of **groups** or "hops" to find the answer.

$$35 \div 5 = 7$$

Quick mental recall of halves and doubles within 20 are essential for Year 2. Children should be able to recall these facts fluently.

Fractions

The **numerator** of a fraction is the “top” number, or how many parts of a whole.

$$\frac{1}{4}$$

The **denominator** of a fraction is the “bottom” number, or how many equal parts the whole is split into.

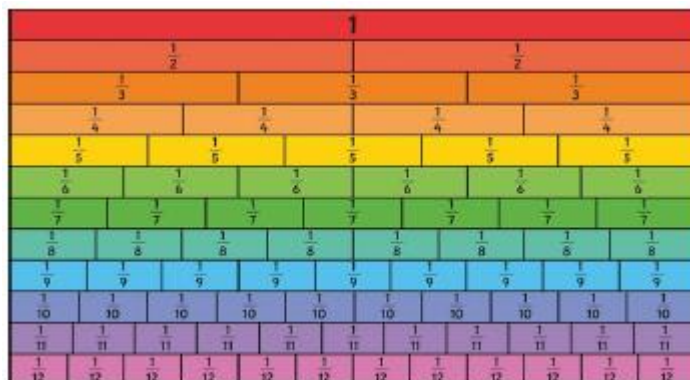
A **unit fraction** is a fraction where the numerator is 1.

$$\frac{1}{4}$$

A **non-unit fraction** is a fraction where the numerator is greater than 1.

$$\frac{3}{4}$$

A **fraction wall** is a pictorial way of showing fractions of a whole.



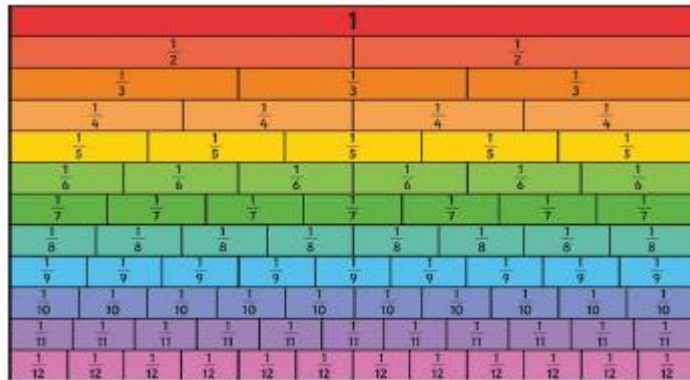
In Year 2, children need to recognise, find, name and write $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity.

Comparing and Ordering Unit Fractions

$$\frac{1}{4} \quad \frac{3}{4} \quad \frac{1}{2}$$

Method 1: Using a fraction wall

The unit fractions can be compared by looking at their size, relative to each other, on a fraction wall. This should help to visualize which fraction is smaller or larger than another. N.B. *This is a part of the non-statutory curriculum for Year 2.*



Method 2: Using the denominators of the fractions

Use the denominator of the fractions to determine which is larger or smaller. Rules: The smaller the denominator, the larger the fraction. The larger the denominator, the smaller the fraction.

$$\text{Largest } \frac{1}{2} \quad \frac{1}{4} \quad \frac{1}{8} \text{ Smallest}$$

Equivalent Fractions

Equivalent fractions are fractions that look different but show exactly the same amount.

Equivalent fractions can be found using pictorial images to match their sizes (e.g. a fraction wall)

Equivalent fractions can also be found by evenly multiplying or dividing the numerator and denominator.

For example:

$$\frac{1}{2} \quad \begin{array}{c} \times 2 \\ \times 2 \end{array} \quad \frac{2}{4}$$

Or:

$$\frac{2}{4} \quad \begin{array}{c} \div 2 \\ \div 2 \end{array} \quad \frac{1}{2}$$

Finding Fractions of Amounts

$$\frac{3}{4} \text{ of } 24$$

Step 1: Divide the whole number by the denominator (the bottom number).

$$\frac{3}{4} \quad 24 \quad \div \quad 4 \quad = \quad 6$$

Step 2: Multiply the answer by the numerator (the top number).

$$\frac{3}{4} \quad 6 \quad \times \quad 3 \quad = \quad 18$$

Step 3: Check your answer.