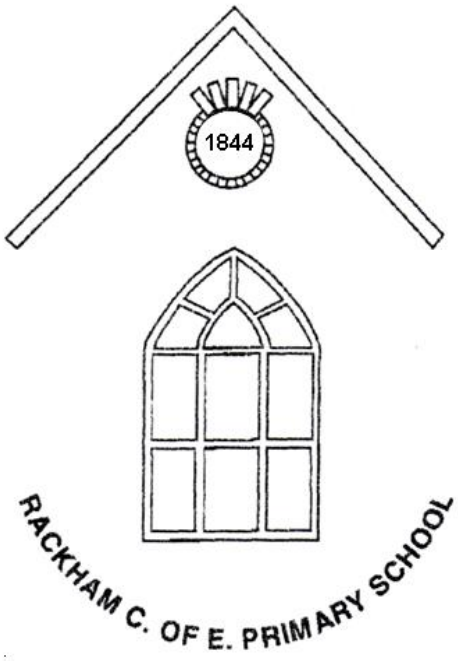
Guidance on calculation methods in Year 2



Information on the four operations (+ - x and ÷) that follows explains the processes your child is using in school.

If you have any questions, do please let us know.

Children set calculations out in 'number sentences' like this:
57 + 5 =
42 - 6 =
5 x 7 =
16 ÷ 2 =

Addition

A Key Stage 1 focus is adding pairs of single digit numbers together to help children learn and so know from memory their number bonds to 20.

+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7	3 + 8	3 + 9	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

Children also use the **commutative law to** help them.

5 + 7 =

Instead of calculating 5 + 7, the children know that the calculation can be turned around to achieve exactly the same answer.

So the calculation 5 + 7 (five add seven) we can turn round and say 7 + 5 (seven add five).

Children understand the inverse and how this can help them generate subtraction calculations. If I know 5 + 7 = 12 then I also know 7 + 5 = 12; 12 – 7 = 5 and 12 – 5 = 7.

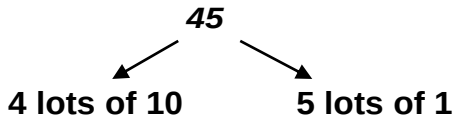
Step by step: how to use a number line to add

57 + 45 =

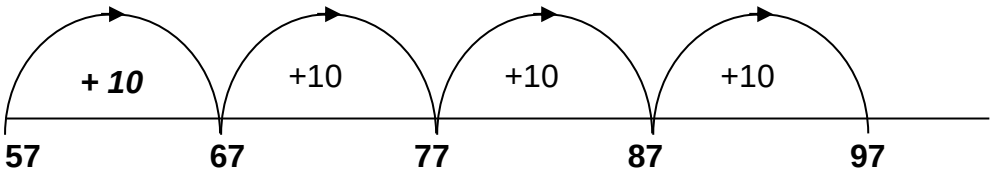
1 Record the **bigger** number at the start of the number line. The bigger number is the starting point for counting on.

57

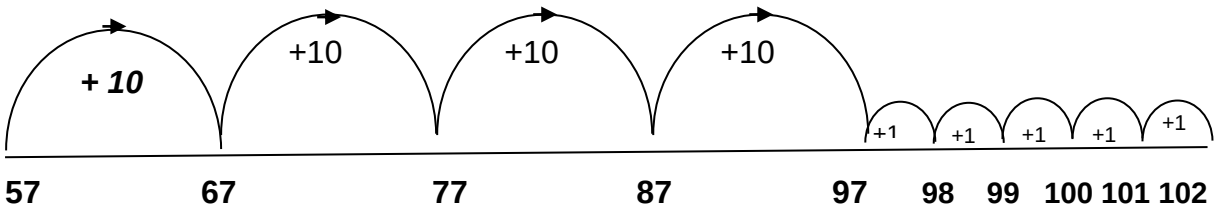
2 Partition the **smaller** number into tens and ones.



3 Add on the four tens as jumps on the number line. Record the number arrived at each time a ten is added on.



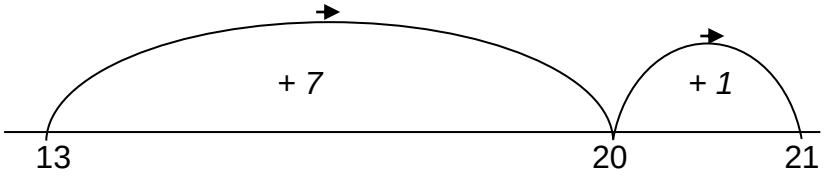
4 Add on the five ones. Record the number jumped to each time a one is added on.



The number arrived at when the tens and the ones have been added on is the answer.

57 + 45 = 102

Alternatively, your child may add on to the next ten.



Answer 13 + 8 = 21

Subtraction

Children understand subtraction as ‘counting on to find the difference’ on a number line.

They draw their own empty number line and use tens and ones to make efficient jumps.

The children understand the relationship between + and -, i.e. that they are **inverse** operations and that subtraction facts can be derived from addition facts e.g. If I know 12 - 7 = 5 I also know that 12 - 5 = 7, 7 + 5 = 12 and 5 + 7 = 12.

Step by step: how to use a number line to subtract

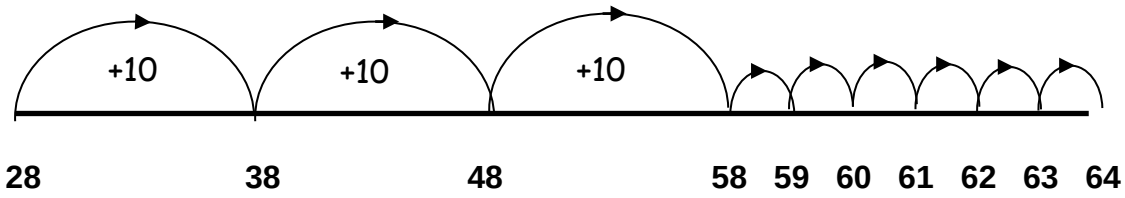
64 – 28 =

1 Record the **smaller** number at the start of the number line and the **bigger** number at the end. The smaller number is the starting point for counting on.

28 **64**

2 Add on in jumps of ten on the number line. Record the number jumped to each time a ten is added on.

3 If adding the next ten would take you past the number at the end of the number line, add on in jumps of one until you reach the bigger number.



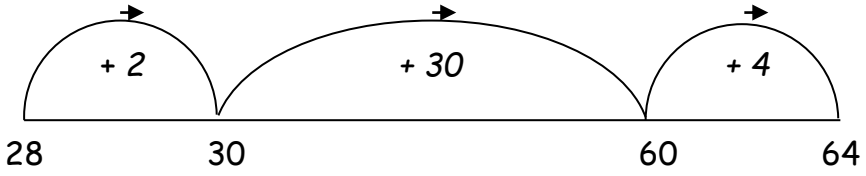
28 **38** **48** **58** **59** **60** **61** **62** **63** **64**

4 Now add up the value of all the jumps.
10 + 10 + 10 = 30 30 + 1 + 1 + 1 + 1 + 1 + 1 = 36

So 64 – 28 = 36

Alternatively, the children may use a number line to add on to the nearest ten:

64 – 28 =



2 + 30 + 4 = 36

Multiplication

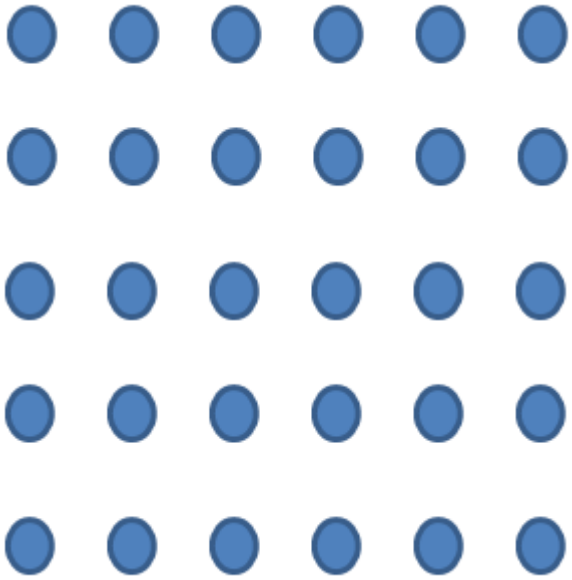
If children know multiples of 2 (the two times table), they can quickly work out multiples of 4 and of 8 by using doubles e.g. If I know that 4 x 2 = 8 then I know that 8 x 2 = 16 because 8 + 8 = 16.

The written method for teaching multiplication is arrays, where children draw dots in rows and columns.

Step by step: how to use arrays to multiply

5 x 6 =

1 5 x 6 would be drawn as 5 **rows of** 6.



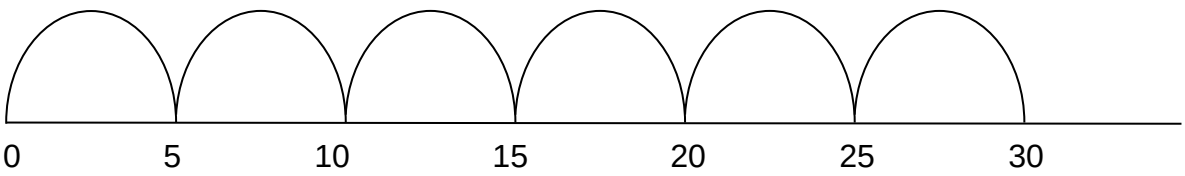
2 Add up all the dots in the rows to find the total.

5 x 6 = 30

We also teach multiplication as repeated addition. This method uses an empty number line to calculate the answer.

6 x 5 =

Read as 6 jumps of 5



6 x 5 = 30

Children use the **commutative law to** help them.

5 x 7 =

Instead of calculating 5 lots of 7, the children know that the calculation can be turned around to achieve exactly the same answer.

5 x 7 (fives lots of seven), turn the calculation round and say 7 x 5 (seven lots of five).

The children know their five times table and so can find the answer more easily.

Division

The children are beginning to understand the relationship between x and ÷, i.e. that they are **inverse** operations and that division facts can be derived from multiplication facts e.g. If I know 7 x 5 = 35, I also know that 5 x 7 = 35; 35 ÷ 7 = 5 and 35 ÷ 5 = 7.

Step by step: how to use boxes to divide

12 ÷ 3 =

1 Look at the number you dividing by and draw that many boxes.

2 Look at the bigger number and draw that many circles by the box.

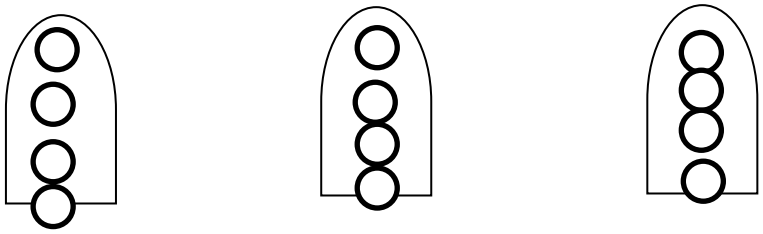
3 Look at the bigger number and draw that many circles by the box. Cross each circle out in turn and draw it in the boxes making sure to take it in turns. When all the circles are shared, count how many circles in each box to check they are all the same.

12 ÷ 3 = 4

Children may also draw an upside down 'U' to share rather than boxes:

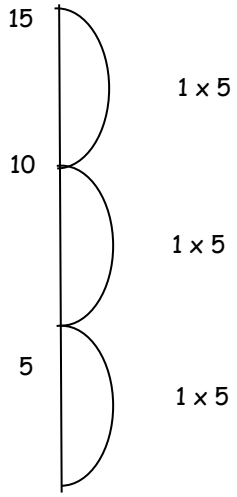
12 ÷ 3 =



12 ÷ 3 = 4

Alternatively children may use the vertical number line method:

15 ÷ 5 =



Count how many lots of 5 or how many jumps of 5.

There are 3 jumps of 5 so the answer is 3.

15 ÷ 5 = 3.

Fractions of quantities

¼ of 12 =

Step by step: how to calculate fractions of quantities

¼ of 12 =

1 Look at the bottom number of the fraction (denominator). This is the number you are dividing by. Draw that many boxes.

2 Look at the whole number and draw that many circles by the box.

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

3 Just as before with division, cross each circle out in turn and draw it in the boxes. Make sure to take each dot in turn. When all the circles are shared, count how many circles in each box to check they are all the same.

⊗ ⊗ ⊗ ⊗ ○ ○ ○ ○ ○ ○ ○ ○

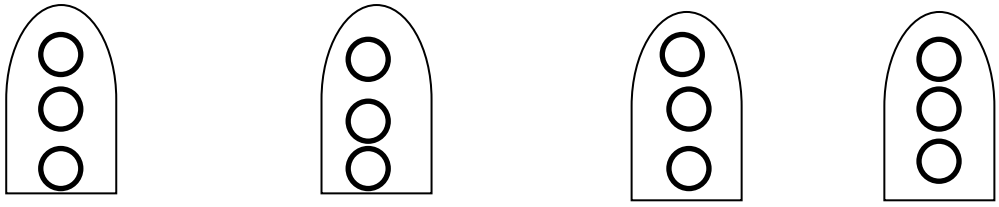
○ ○	○	○

4 Look at the top number (the numerator) to see how many of the groups need to be counted.

¼ of 12 = 3

Children could also use the upside down ‘U’ method rather than boxes.

¼ of 12 =



Alternatively, children may use their knowledge that one quarter is half of a half.

0 0 0 0 0 0 0 0 0 0 0 0	
0 0 0 0 0 0	0 0 0 0 0 0
0 0 0 | 0 0 0	0 0 0 | 0 0 0

They may use numbers instead of dots.

12	
6	6
3 | 3	3 | 3