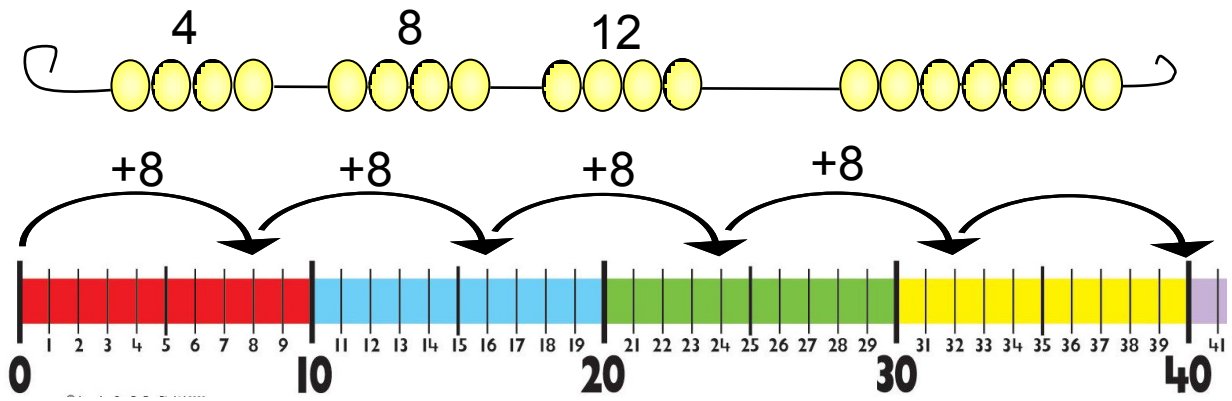
Year 3

Multiplication and division

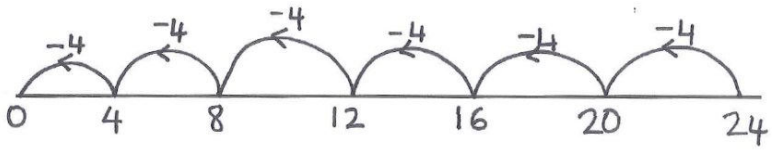
Children are expected to:

- **Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.**

There are various resources that can be used to support children's conceptual understanding of the multiplication tables including bead strings, number lines, counters, numicon etc.



Children should be able to count forwards and backwards in these multiples. They should also be able to answer questions from these multiplication tables out of order and recognise the inverse calculations.



As children become more familiar with multiplication and division facts, they should start to see the links between the different times tables.

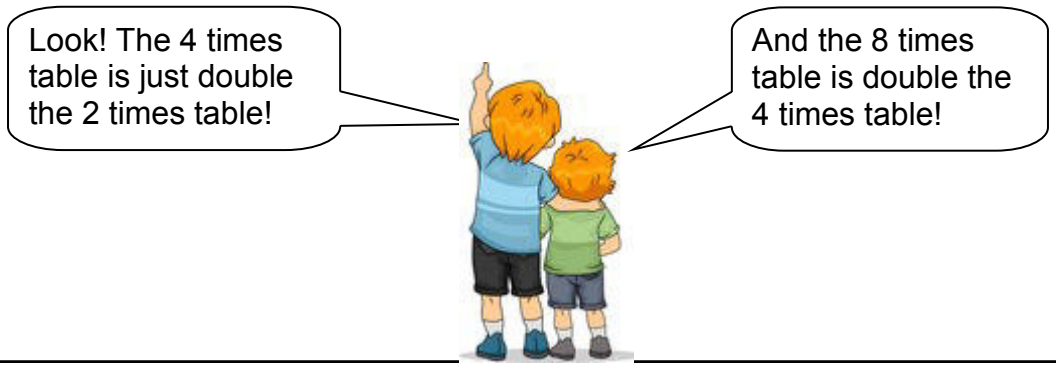
2 times table
1 x 2 = 2
2 x 2 = 4
3 x 2 = 6
4 x 2 = 8
5 x 2 = 10
6 x 2 = 12
7 x 2 = 14
8 x 2 = 16
9 x 2 = 18
10 x 2 = 20
11 x 2 = 22
12 x 2 = 24

x2

4 times table
1 x 4 = 4
2 x 4 = 8
3 x 4 = 12
4 x 4 = 16
5 x 4 = 20
6 x 4 = 24
7 x 4 = 28
8 x 4 = 32
9 x 4 = 36
10 x 4 = 40
11 x 4 = 44
12 x 4 = 48

x2

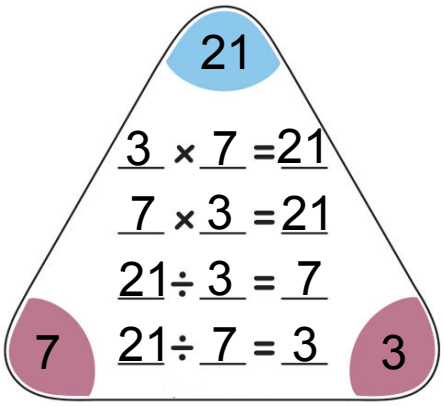
8 times table
1 x 8 = 8
2 x 8 = 16
3 x 8 = 24
4 x 8 = 32
5 x 8 = 40
6 x 8 = 48
7 x 8 = 56
8 x 8 = 64
9 x 8 = 72
10 x 8 = 80
11 x 8 = 88
12 x 8 = 96



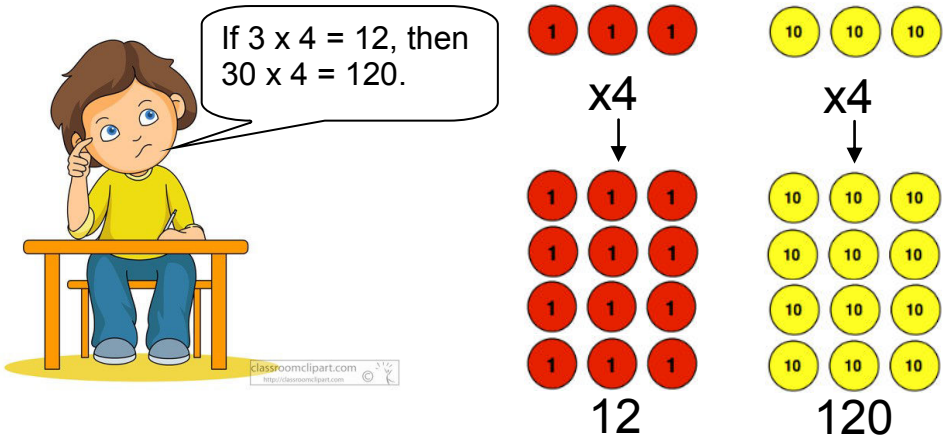
Year 3

Multiplication and division

Children should continue to develop their knowledge of fact families. This will strengthen their awareness of the **commutativity of multiplication** (that the 2 numbers being multiplied can be done in any order). It will also help children to grasp that multiplication and division are **inverse operations**.



Children should also start to use known facts to make links with other facts, for instance numbers that are ten times bigger (multiples of 10). Place value counters can be used to demonstrate this idea.



The same principle can be applied to division facts.

If 6 ÷3 = 2 then **60 ÷3 = 20**

Year 3

Multiplication and division

- **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.**

Once the children are ready to multiply 2 digit numbers, they are taught to partition them first. By breaking the number into smaller parts and using known facts, the calculation becomes much easier to solve.

For example:

3×23

$20 \quad 3$

$3 \times 20 = 60$

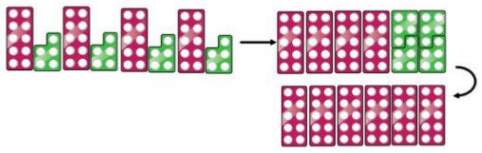
$3 \times 3 = 9$

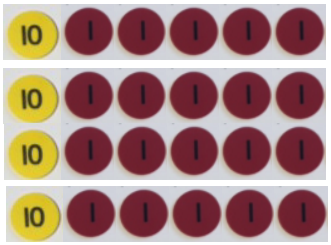
$60 + 9 = 69$

Children use their knowledge of 3 x 2 = 6 to solve this.

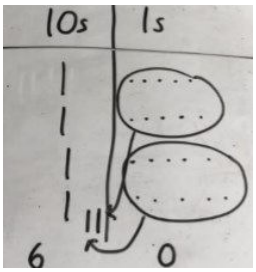
Initially, concrete resources are used to ensure that the children have a deep understanding of this procedure.
e.g. 4 x 15 =

concrete





pictorial



abstract

4 x 15

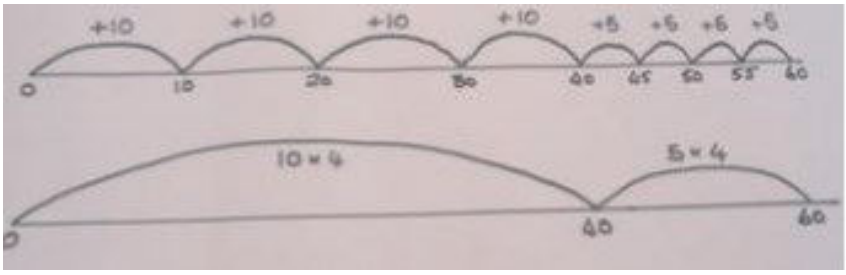
10 5

10 x 4 = 40

5 x 4 = 20

40 + 20 = 60

Blank number lines can also be used to demonstrate this method.

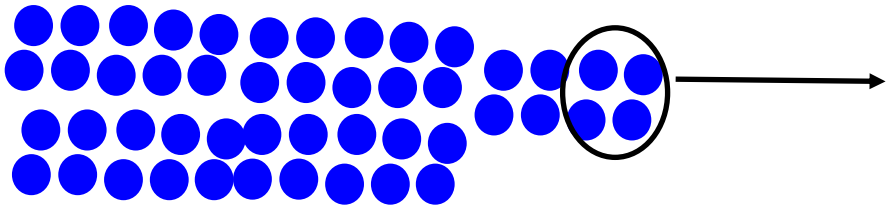


Year 3

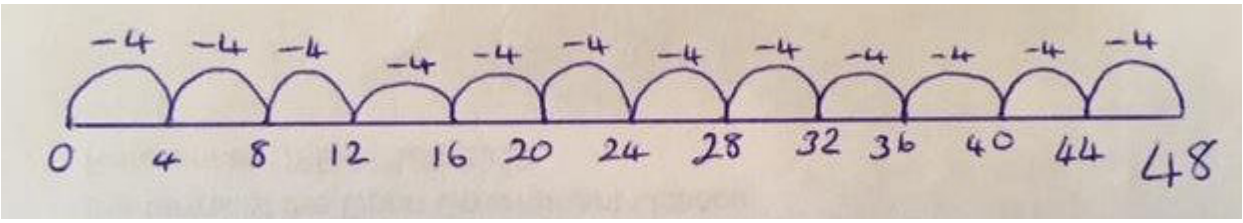
Multiplication and division

For **division**, children should work towards developing a more efficient number line strategy, through the use of **repeated subtraction**.

To begin with, children use concrete resources such as counters to repeatedly 'take away' the divisor (the number they are dividing by) until they no longer can.
e.g. **48 ÷ 4 = ?**



The pictorial method, using a **blank number line**, can be done alongside the concrete method by an adult until children are secure in their understanding of division as repeated subtraction and are able to solve problems using the blank number line method (see below) independently.



Explanation of how to use the blank number line method

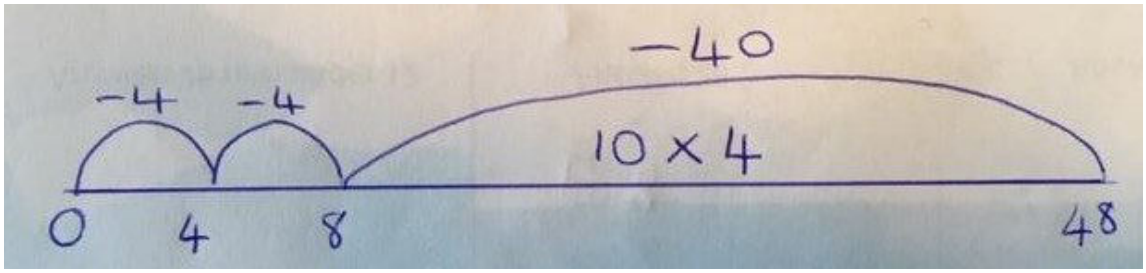
1. Children draw a blank number line and write the dividend (the number being divided) on the far right, in this case 48.
2. They then jump back in steps of the divisor, in this case 4, and write the number that they land on underneath the landing point.
3. They repeat this process until they get to zero.
4. They then count the number of jumps that they made (the number of times that they were able to subtract the divisor from the number being divided)

Year 3

Multiplication and division

Initially, children will practise simply subtracting the divisor from the number being divided. However, as their times table knowledge and knowledge of the method improves, they will be able to partition the divisor into chunks to make this method more efficient.

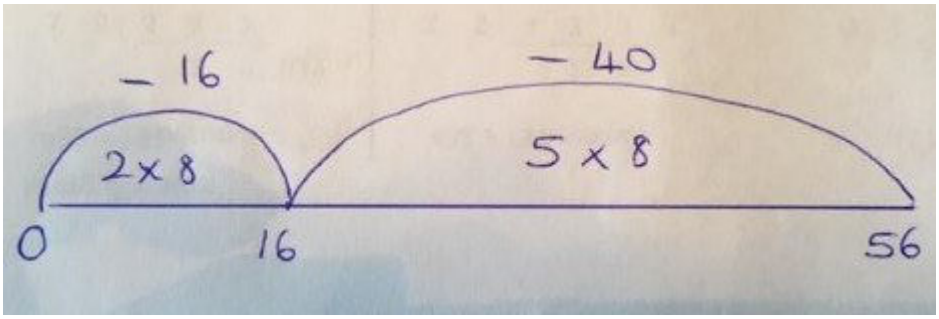
Example - "I know that 10 x 4 = 40 so I can take away 1 chunk of 40 and know this is the same as 10 smaller jumps of 4"



The dividend in the example above has been partitioned into tens and ones. However, it is possible to partition the number in any way that the child wishes, using their known times tables facts.

For example: **56 ÷ 8 = ?**

In this example, children may know that 5 x 8 = 40 and 2 x 8 = 16 and therefore choose to partition 56 into 40 and 16.



Children should be encouraged to use known times table facts and to work as efficiently as possible i.e. complete the calculation in as few a jumps as possible.

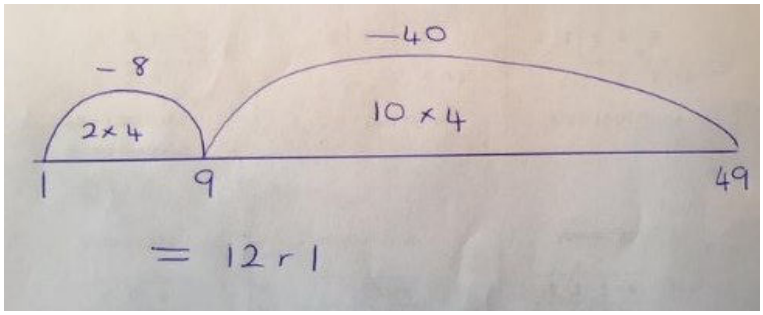
Year 3

Multiplication and division

Children are introduced to the concept of remainders. A remainder is any number left over once an amount has been divided equally. When introducing the children to the idea of remainders, they are reminded that division should always be **fair and equal**. Children that are taught that sometimes, in order to be fair, there will be some left over that cannot be equally shared or grouped.

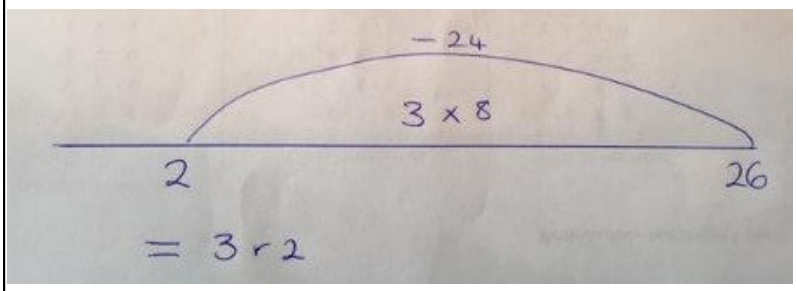
Using the repeated subtraction method, children continually jump back until they reach the lowest number that they can without going over zero. If they cannot land exactly on zero they should stop and identify what is left over as the remainder. Again, children are encouraged to identify the biggest 'chunk' of the dividend and use known facts.

E.g. **49 ÷ 4 = ?**



I know that I can't subtract 4 from 1 therefore there is 1 left over. The answer is 12 remainder 1.

E.g. **26 ÷ 8 = ?**



I know that I can't subtract 8 from 2 therefore there are 2 left over. The answer is 3 remainder 2.

- **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 *m* objects.**

Missing number problems are a good way to ensure that the children know the expected multiplication facts and to consolidate the relationship between multiplication and division.

6 x 4 = ☐ 32 ÷ ☐ = 4

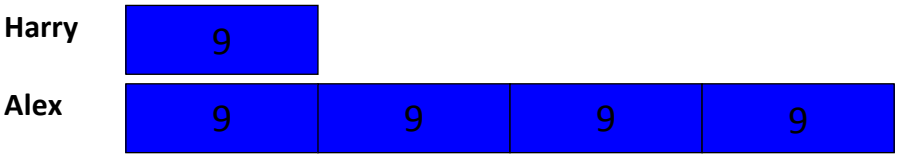
☐ x ◯ = 48 ☐ ÷ 3 = 50

Year 3

Multiplication and division

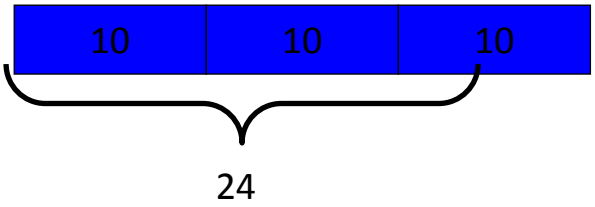
Children should be given practical problems where they will need to scale up:

“Harry’s sunflower is 9cm tall. Alex’s sunflower is 4 times taller. How tall is Alex’s sunflower?”



Problems where the answer has a reminder but the answer needs to be given as a whole number, including the remainder, should also be given.

“Pencils are sold in packs of 10. How many packs will I need to buy for 24 children?”

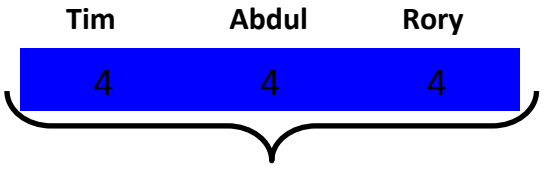


There are 52 books left over from a book sale.

Tim, Abdul and Rory are given 4 books each.

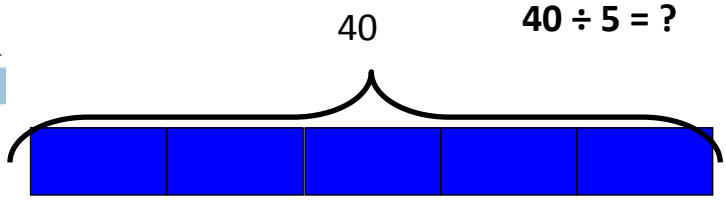
The rest of the books are shared equally between 5 classes.

How many books does each class receive?



52 - 12 = 40

40 ÷ 5 = ?



There are four times as many men as women on a train.

There are 14 women.

How many men and women are there altogether on the train?

Year 3

Multiplication and division

Key vocabulary:
See Year 1 & 2; partition, grid method, inverse, multiplier, multiplicand, product, divisor, divided, quotient.