# Year 1 Maths Calculation Policies

**National Curriculum Programme of Study:**

Pupils should be taught to:

- read, write and interpret mathematical statements involving addition (+) and equals (=) signs
- represent and use number bonds and related addition 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 such as 4 = ? + 1

**Y1**
Addition

## BY THE END OF YEAR 1…

Children will be making real progress with knowing, off by heart, all addition facts for each number totaling up to 20 (e.g. know that 9 + 5 = 14). They should also understand the effect of adding zero.

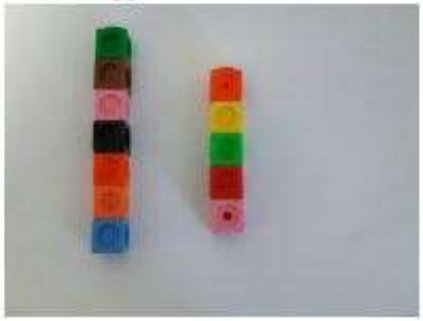
## Using grouped objects for addition, up to 20

Once secure with counting reliably numbers from one to twenty and adding one more, teachers should demonstrate, combining two sets of concrete objects to find totals to 20.

1

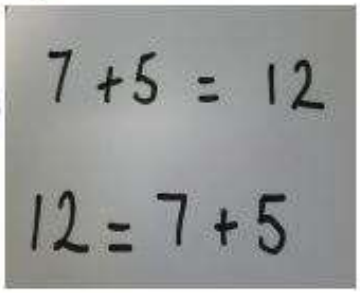
Counters or other classroom counting objects should be used initially. Combining two sets of objects (aggregation - photo 1) which will progress onto adding on to a set (augmentation - photo 2).

2

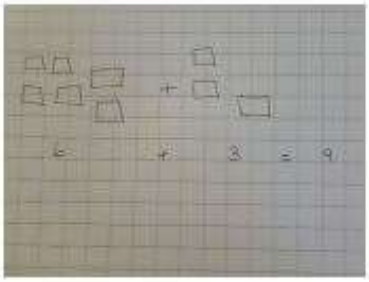


Recording as shown below:

3



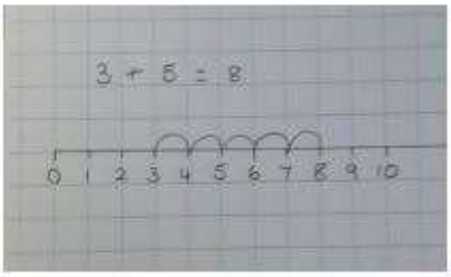

## Using pictures and diagrams to help calculate addition number sentences



## Understanding of counting on using a number line

3 + 5 = 8


Recording as shown:




The next step is to solve missing number problems within 20. Ensure children are familiar with both 5 + ? = 8 and 8 = 5 + ?

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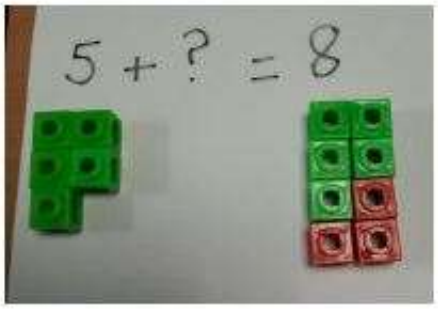
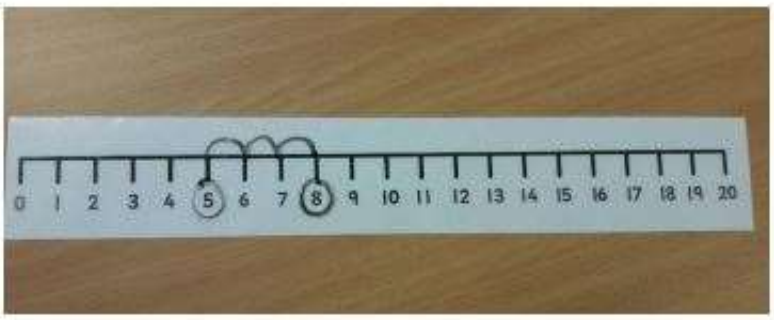



Start on 5.
How many jumps to get to 8?

5 + 3 = 8



**National Curriculum Programme of Study:**

Pupils should be taught to:

- read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- 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 such as 4 = ? - 5

# Y1

## Subtraction

### BY THE END OF YEAR 1…

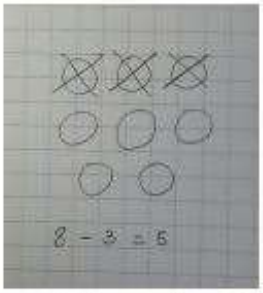
Children will be making real progress with knowing, off by heart, all subtraction facts within 20, e.g. know that 14 - 9 = 5.
Children should understand the effect of subtracting zero.

### Using physical objects for subtraction up to 20

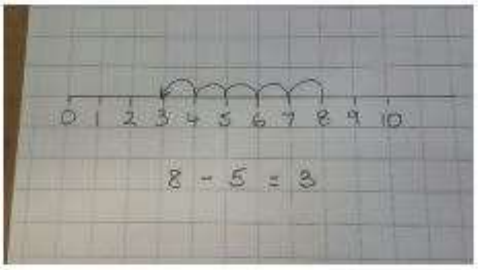
Once secure with counting reliably numbers from one to twenty and subtracting one, teachers should demonstrate taking away concrete objects, from a group, within 20.

Counters or other classroom counting objects should be used initially. Taking away a given number of objects from a group.

Recording as shown:

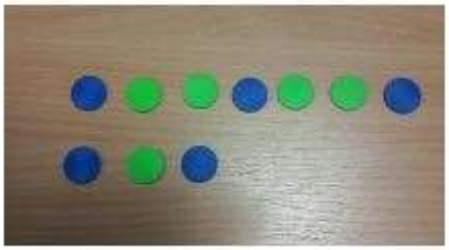



### Understanding taking away using a number line



## Understanding subtraction as 'finding the difference'

This should be introduced using concrete objects.



What is the difference between 7 and 3?

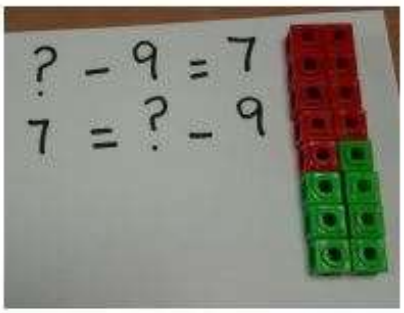
7 - 3 = 4

What is the difference between 5 and 2?

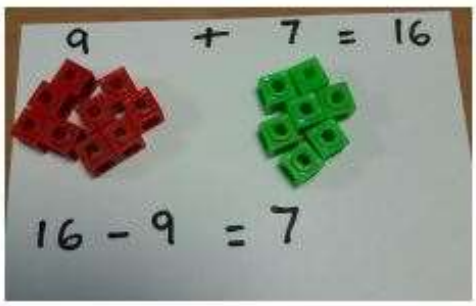
5 - 2 = 3

## Solving one-step problems using concrete objects and pictorial representations

Missing number problems such as:




This problem would require much discussion and posing of questions. *What can you tell me about the first number in a take away calculation? You have 9 red cubes and 7 green cubes, what do you do with them now to solve the problem? (Plausible response: 9-7=2). Two's not big enough, what else could we do?*



**National Curriculum Programme of Study:**

- 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.

# Y1
## Multiplication

### BY THE END OF YEAR 1…

Children will be able to understand multiplication as describing an array.
Understand it is related to doubling and combining groups of the same size (repeated addition).

### Using grouped objects for addition, without recombining

With support, children in year 1 should be arranging a variety of physical objects into groups of the same size, counting the number of groups, the amount in each group, and the total.

12 green cotton reels arranged into groups of 3

6 clothes pegs arranged into groups of 2

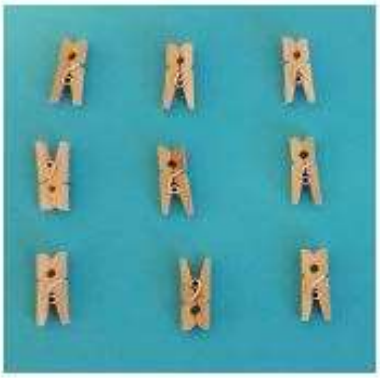
8 socks arranged into groups of 2, or pairs

### Arranging objects into rectangular arrays

To support the progression towards a formal visual image of multiplication, and into a formal written method in Key Stage 2, children need to be shown how to arrange their objects into a rectangular array.

Children in year 1 will be counting in steps of 2, 5 and 10, and so it is useful if these numbers are used initially in any arrays created.

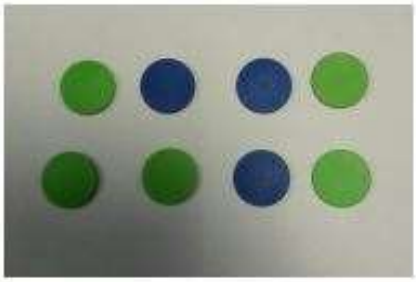
Arrays can then be created with numbers other than 2, 5 and 10, with objects arranged in rows and columns of 3 or 4.



9 pegs arranged into three rows of three

Model the drawing of an array, initially from an arrangement of physical objects. Children can then draw their own arrays to represent their physical groupings.

Physical objects can be replaced with circular counters, representing the objects. Again children will need experience of grouping these physically into rows for an array, before drawing them.



2 groups of 4 counters
2 x 4

Arrays can be rotated to start to demonstrate the commutativity of multiplication, e.g. 2 groups of 4 is the same as 4 groups of 2

4 groups of 2 counters
4 x 2

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

Three children get four stickers each during a week.
How many stickers altogether?

3 lots of 4
3 groups of 4

An array showing 3 groups of 4.
3 x 4

**National Curriculum Programme of Study:**

- 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.

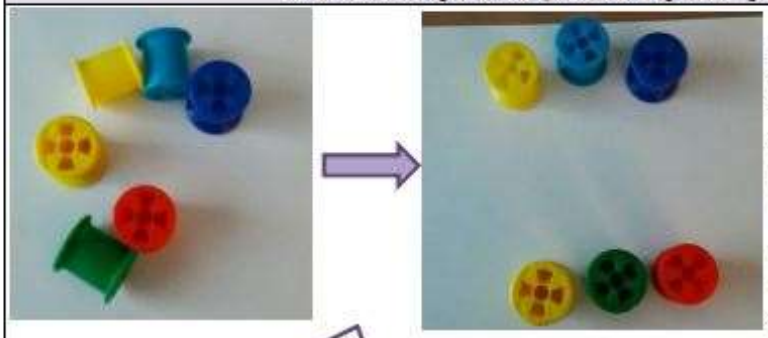
# Y1
## Division

### BY THE END OF YEAR 1…

By the end of Year 1, children will be able to show their understanding as:

Understanding division as sharing and grouping
Recognising one half as one of two equal parts of a quantity
Recognising one quarter as one of four equal parts of a quantity.

### Understanding both 'equal sharing' and 'grouping'

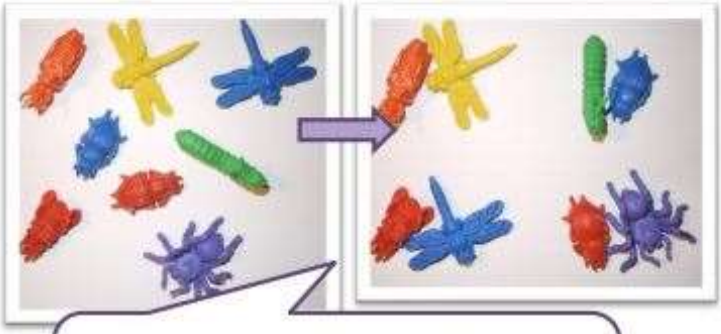


**Equal sharing** occurs when a quantity is shared out equally into a given number of portions. We find out how many there are in each portion.

When sharing, we know the total number being shared, and the number of sets to share between. We find out how many in each portion.

*6 cotton reels shared between 2 children.*
*How many will they have each? …3*
*They have half each. Half of 6 is 3.*

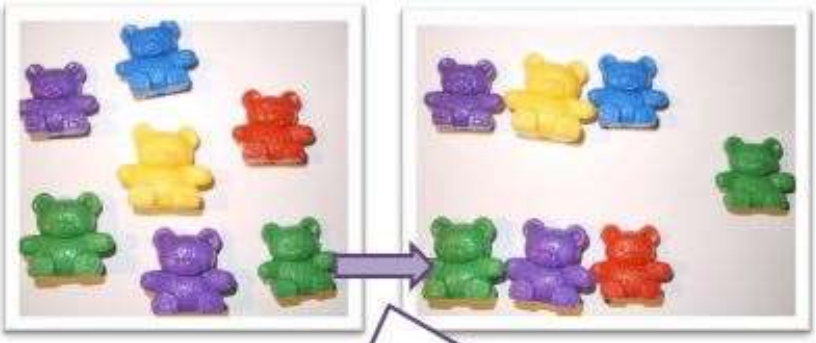
Fractional language can be used alongside sharing, eg. 'halving' when sharing between two.



**Grouping o**ccurs when finding how many groups of the divisor are in the original amount.
When grouping, we know the total number of objects, and the number in each set. We find out how many sets are needed.

*8 minibeasts are put into groups of 2.*
*How many children can have 2 minibeasts?...4. They have a quarter of the minibeasts each. One quarter of 8 is 2.*

## Extension: Introducing remainders when dividing



*7 bears are shared between 2 children.*
*How many will they have each?*
*They have 3 each with one left over, or a remainder of 1.*

**Remainder (left over)** occurs when a group cannot be shared equally without finding a fractional part of an object or quantity. Introduce the concept of remainder to the children, using 'everyday' objects and real life contexts where possible.

## Solving one-step problems by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

10 packs of pegs are put into groups of 2.
How many children can have 2 packs each?