

Year 1

Daisyfield Primary School Calculation Policy

Updated March 2025

Progression Toward Mental Calculation Strategies **(Addition and Subtraction)**

The ability to calculate mentally is an essential skill, but, as with written methods of calculation, children need to be taught. **It is important to ensure that when teaching particular strategies, children have the appropriate prerequisite skills and are guided as to how and when that strategy is appropriate.**

Children should be taught and encouraged to ask themselves the following questions when faced with a calculation:

- Do I know the answer?
- Can I work it out in my head?
- Do I need to do a jotting?
- Do I need to use a written method?

When using a jotting, there is no requirement to follow a particular method of recording.

A feature of mental calculation is that a type of calculation can often be worked out in several different ways. Which method is best will depend on the numbers involved, the age of the children and the range of methods that they are confident with.

In developing a progression through mental calculation strategies for addition and subtraction, it is important that children understand the relevant concepts, in that addition is:

- combining two or more groups to give a total or sum
- increasing an amount

and subtraction is:

- removal of an amount from a larger group (take away)
- comparison of two amounts (difference)

They also need to understand and work with certain principles, that:

- addition and subtraction are inverses
- addition is commutative i.e. $5 + 3 = 3 + 5$ but subtraction is not $5 - 3$ is not the same as $3 - 5$
- addition is associative i.e. $5 + 3 + 7 = 5 + (3 + 7)$ but subtraction is not $10 - 3 - 2$ is not the same as $10 - (3 - 2)$

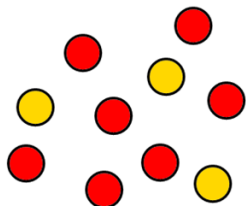
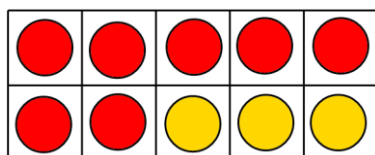
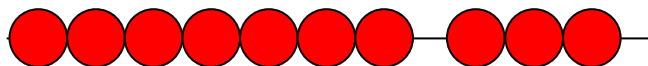
Commutativity and associativity mean that calculations can be rearranged, e.g. $4 + 13 = 17$ is the same as $13 + 4 = 17$.

End of Year Objective:**Add and subtract one-digit and two-digit numbers to 20, including zero.****Rapid Recall**

Children should be able to:

- represent and use number bonds and related subtraction facts within 20

Number bonds can be represented practically using:

Double sided counters:Ten frames:Beadstrings**Mental Strategies*****Count on or back in ones (chain count and linked to objects, i.e. 1-1 correspondence)***

Initially, children's counting for addition and subtraction should be linked to the objects that they are using to represent the calculation, e.g. cubes, counters etc. It is important that at this stage the counting and calculating are supported by practical equipment and/or be in context so that they support children's developing understanding of the concepts of addition and subtraction in a concrete rather than abstract way.

Children can begin to use chain counting (i.e. unsupported by objects) when they are confident with the concepts of addition and subtraction and have developed their understanding of using counting on or back, rather than counting all, as a strategy for these calculations.

Examples of calculations:

4 + 5	count on in ones from 4 (or in ones from 5)
8 - 3	count back in ones from 8
10 + 7	count on in ones from 10 (or use place value)
13 + 5	count on in ones from 13
17 - 3	count back in ones from 17

Prerequisite skills:

- Count using one to one correspondence
- Count forwards and backwards in ones

To develop an understanding of addition and subtraction, the progression through learning should be:

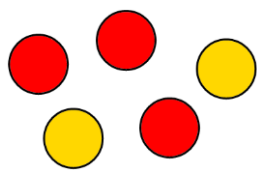
Concrete → Model → Abstract

An example of this might be:

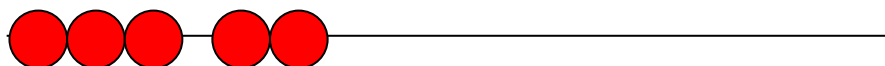
Using counters → Using a beadstring → Placing cubes on a number track → Using a numberline
(Concrete – random) (Concrete – organised) (Model) (Abstract)

Addition

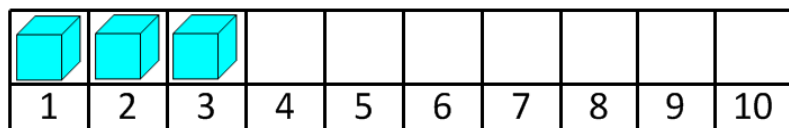
$$3 + 2 = 5$$



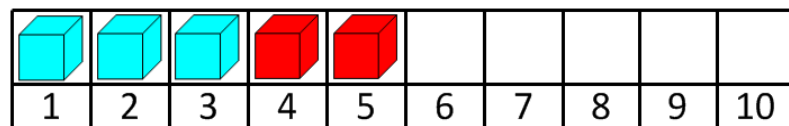
Counters



Beadstring

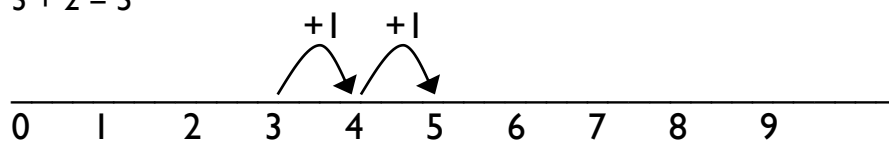


Number track stage 1



Number track stage 2

$$3 + 2 = 5$$



Numberline

Subtraction

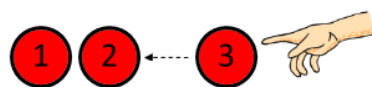
$$5 - 2 = 3$$

Touch count and remove the number to be taken away, in this case 2.

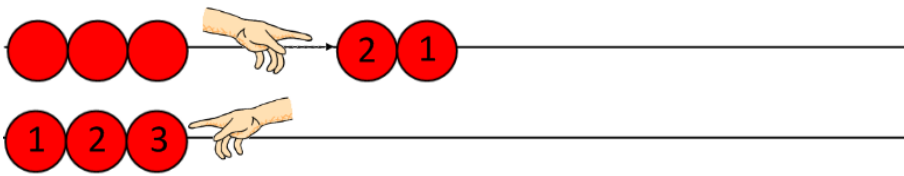


Counters stage 1

Touch count to find the number that remains.

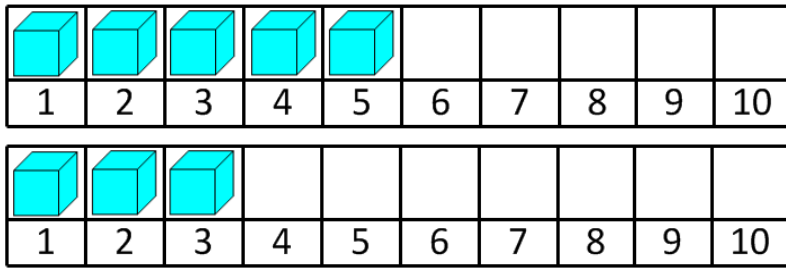


Counters stage 2



Beadstring stage 1

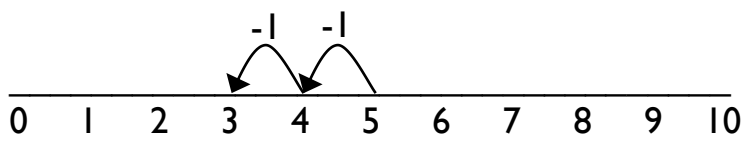
Beadstring stage 2



Number track stage 1

Number track stage 2

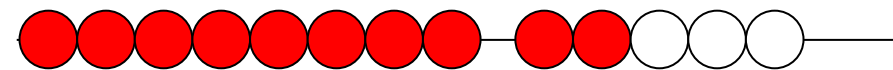
$$5 - 2 = 3$$



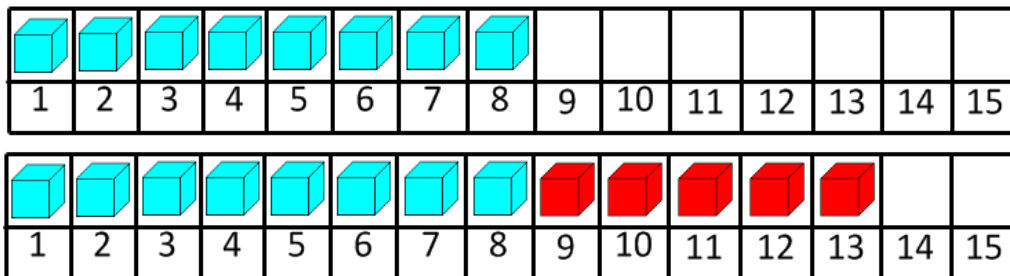
Numberline

Addition

$$8 + 5 = 13$$



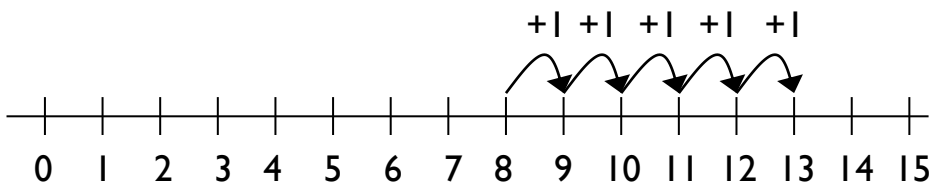
Beadstring



Number track stage 1

Number track stage 2

$$8 + 5 = 13$$

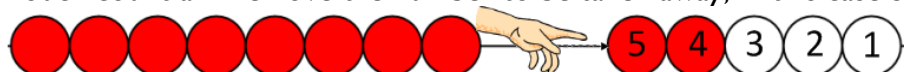


Numberline

Subtraction

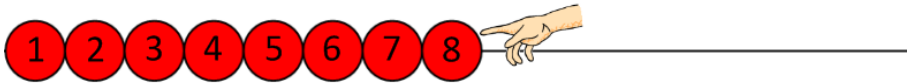
$$13 - 5 = 8$$

Touch count and remove the number to be taken away, in this case 5.

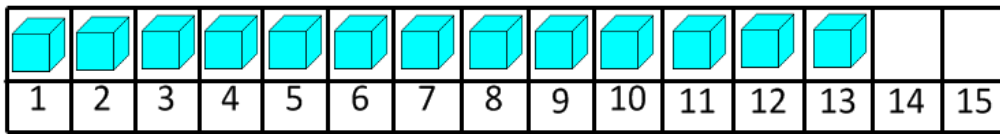


Beadstring stage 1

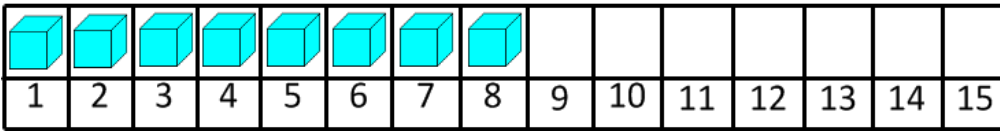
Touch count to find the number that remains.



Beadstring stage 2

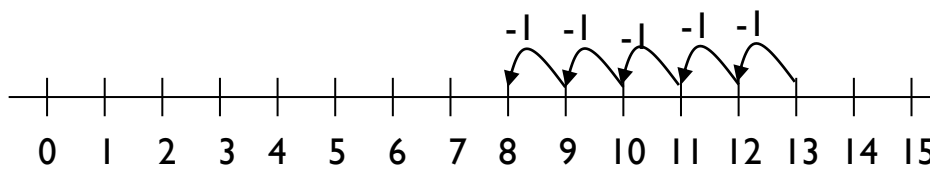


Number track stage 1



Numbertrack stage 2

$$13 - 5 = 8$$



Numberline

Reorder numbers in a calculation

In Y1, children need to recognise that they can rearrange an addition, but not a subtraction. They also need to understand that the principle behind reordering a calculation is to make it more efficient, particularly when utilising a counting on strategy. Children need to be encouraged to identify calculations which should be reordered and those that are already in the most efficient format.

Examples of calculations:

8 + 3	doesn't need reordering as the greater number is first already
2 + 7	reorder as 7 + 2
5 + 13	reorder as 13 + 5
11 + 6	doesn't need reordering as the greater number is first already

Prerequisite skills:

- Understand the place value of numbers to identify which number is the greater
- Understand that reordering works (at this stage) for addition but not subtraction* (*because children are not at the level when they are solving calculations such as $16 - 3 - 6$, when reordering would be appropriate*).

Partition small numbers, e.g. $8 + 3 = 8 + 2 + 1$

Utilising partitioning in this way is useful as a strategy for bridging across 10 or multiples of 10 to make calculations more efficient.

Examples of calculations:

7 + 5	partitioned as $7 + 3 + 2$
9 + 7	partitioned as $9 + 1 + 6$
6 + 8	partitioned as $6 + 4 + 4$

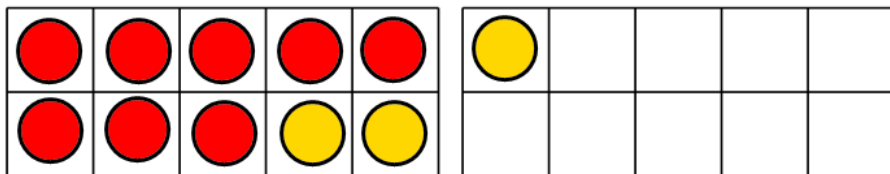
Prerequisite skills:

- Partition numbers in different ways, e.g. 5 as 2 + 3 to enable $8 + 5$ as $8 + 2 + 3$
- Know, or quickly derive, number bonds for numbers up to and including 10

This method can be supported by the use of practical equipment, e.g.

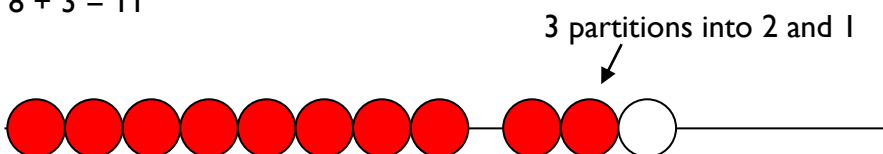
Addition

$$8 + 3 = 11$$



Ten frame

$$8 + 3 = 11$$



Beadstring

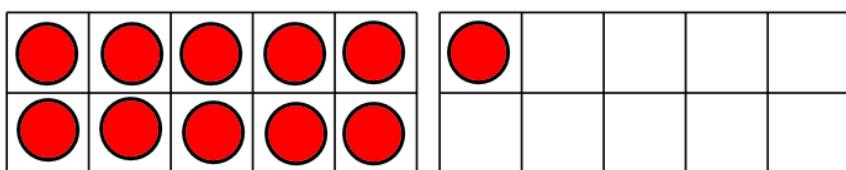
$$8 + 3 = 11$$



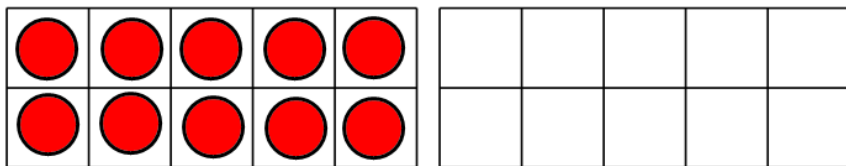
Numberline

Subtraction

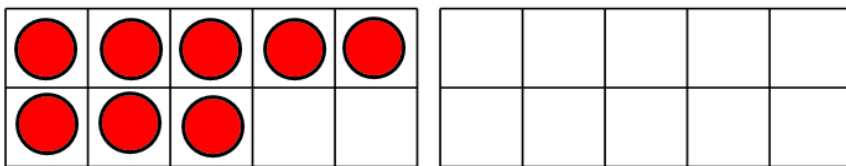
$$11 - 3 = 8$$



Ten frame stage 1

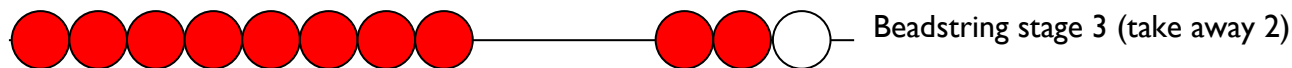
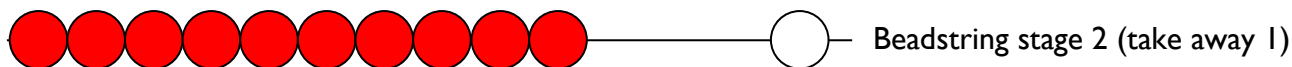
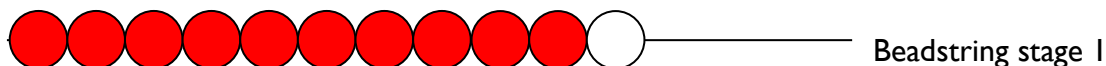


Ten frame stage 2 (take away 1)

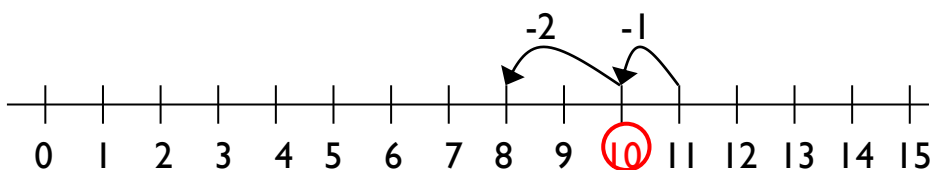


Ten frame stage 3 (take away 2)

$$11 - 3 = 8$$



$$11 - 3 = 8$$



WRITTEN ADDITION

End of Year Objective:

Add one-digit and two-digit numbers to 20, including zero (using concrete objects and pictorial representations).

Children will continue to use practical equipment, combining groups of objects to find the total by counting all or counting on. Using their developing understanding of place value, they will move on to be able to use Base 10 equipment to make teens numbers using separate tens and units. For example, when adding 11 and 5, they can make the 11 using a ten rod and a unit.



The units can then be combined to aid with seeing the final total, e.g.



so $11 + 5 = 16$. If possible, they should use two different colours of base 10 equipment so that the initial amounts can still be seen.

WRITTEN SUBTRACTION

End of Year Objective:

Subtract one-digit and two-digit numbers to 20, including zero (using concrete objects and pictorial representations).

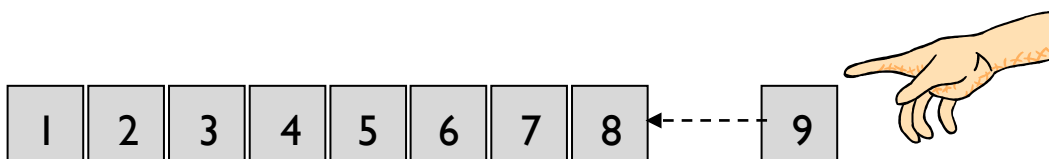
Children will continue to use practical equipment and taking away strategies. To avoid the need to exchange for subtraction at this stage, it is advisable to continue to use equipment such as counters, cubes and the units from the Base 10 equipment, but not the tens, e.g. $13 - 4$



Touch count and remove the number to be taken away, in this case 4.



Touch count to find the number that remains.



Progression Towards a Written Method for Multiplication

Y1

End of Year Objective:

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

In year one, children will continue to solve multiplication problems using practical equipment and jottings. They may use the equipment to make groups of objects. Children should see everyday versions of arrays, e.g. egg boxes, baking trays, ice cube trays, wrapping paper etc. and use this in their learning, answering questions such as 'How many eggs would we need to fill the egg box? How do you know?'

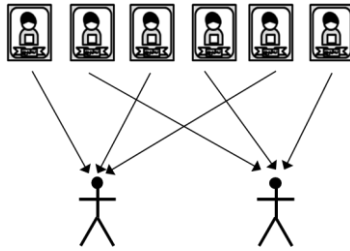
Progression Towards a Written Method for Division

Y1

End of Year Objective:

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

In year one, children will continue to solve division problems using practical equipment and jottings. They should use the equipment to share objects and separate them into groups, answering questions such as 'If we share these six apples between the three of you, how many will you each have? How do you know?' or 'If six football stickers are shared between two people, how many do they each get?' They may solve both of these types of question by using a 'one for you, one for me' strategy until all of the objects have been given out.



Children should be introduced to the concept of simple remainders in their calculations at this practical stage, being able to identify that the groups are not equal and should refer to the remainder as '... left over'.