

EYFS Calculation Policy



Concrete, Pictorial, Abstract Approach

One of the key principles behind the Singapore Maths approach and Maths Mastery is based on the concrete, pictorial, abstract approach. This approach identifies three steps (or representations) that are necessary for pupils to develop an understanding of different concepts.

1. Concrete Representation

Pupils are first introduced to an idea or skill using real objects. In division, for example, this might be done by separating apples amongst children. This is a 'hands on' approach and all classrooms have a wide range of practical resources available for pupils to use.

2. Pictorial Representation

Pupils are encouraged to relate their concrete understanding to pictorial representations. These representations may be a diagram or a picture of the Mathematical problem.

3. Abstract Representation

This is the symbolic stage – the pupils use Mathematical symbols to represent problems, for example $12 \times 2 = 24$. Whilst this Calculation Policy aims to show the Concrete / Pictorial / Abstract approach to the different calculations, it is not always noted further up the year groups. However, it is expected that the Concrete / Pictorial / Abstract approach is used continuously in all new learning and calculations, even when not noted.

Foundation Stage – Addition

Early Learning Goal for Mathematics

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number
- Subitise (recognise quantities without counting) up to 5.
- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.

Key Vocabulary

add, more, and, make, sum, total, altogether, double, one more, two more etc., How many more to make ?, How many more is ... than ... ?

In the Foundation Stage, pupils should be developing their concept of the number system through the use of concrete materials and pictorial representations. They should experience practical calculation opportunities using a wide variety of equipment such as small world toys, counters, cubes etc. Pupils are encouraged to develop ways of recording calculations using pictures etc.

Games and songs are used to develop understanding of the vocabulary associated with addition. Subitising plays a big part in the development of Number in the Foundation Stage, with children learning to 'see' how many there are, without the need to count.

Method 1 – use a range of practical resources to develop counting skills, and then develop their understanding of the concept of addition through counting activities. To use counting objects to count out aloud and reinforce one-to-one counting skills.

Method 2 – to be able to combine groups of objects using concrete apparatus.

How many dinosaurs are there? What about if I give you two more? How many are there now?

How many spots altogether on the domino tiles?

Method 3 – to use number lines to count along.

Method 4 – to begin to use the part-whole model to recognise different ways of making numbers and to develop knowledge of number bonds.

Mental Strategies

- To develop a mental image of the number system To understand the value of a number.
- To be able to count forwards.

Foundation Stage – Subtraction

Early Learning Goal for Mathematics

Children at the expected level of development will:

- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Key Vocabulary

take away, leave, How many are left ?, How many have gone ?, one less, two less etc., How many fewer is ... than ... ?, difference between.

In the Foundation Stage, pupils should be developing their concept of the number system through the use of concrete materials and pictorial representations. They should experience practical calculation opportunities using a wide variety of equipment such as small world toys, counters, cubes etc. Pupils are encouraged to develop ways of recording calculations using pictures etc. Games and songs are used to develop understanding of the vocabulary associated with subtraction.

Method 1 – Using a range of practical resources, pupils should develop their understanding of

subtraction as taking away through counting activities.

I had nine sweets and I ate two. How many do I have left ?

Method 2 – to listen to a subtraction story and use objects or drawings to represent the story, taking objects away, or crossing out drawings to visualise the subtraction.

Mental Strategies

- To develop a mental image of the number system.
- To count backwards using familiar number rhymes (eg: Ten Green Bottles).
- Count backwards from different starting points.

Foundation Stage – Multiplication

Early Learning Goal for Mathematics

Children at the expected level of development will:

- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Key Vocabulary

group, lots of, double.

In the Foundation Stage, pupils will experience equal groups of objects. The focus at this stage should be on solving practical problems with a 'hands on' approach.

Method 1 – Pupils will count groups of the same number of objects and add them together. They will learn about grouping in practical contexts and through pictorial representations.

Method 2 – Pupils will solve simple problems involving doubling. Pupils will be encouraged to explore a range of concrete materials to show a number and then repeat the number to show doubling.

Mental Strategies

- Develop a mental image of the number system. Understand the value of a number.
- Count in 2s, 5s and 10s.
- Explore number patterns on a number line and on a one-hundred square (eg: 2s, 5s and 10s).

Foundation Stage – Division

Early Learning Goal for Mathematics

Children at the expected level of development will:

- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Key Vocabulary

halve, half, share, share equally, groups.

In the Foundation Stage, pupils will experience the equal sharing of objects. The focus at this stage should be on solving practical problems with a 'hands on' approach.

Method 1 – Pupils experience early division by sharing objects and counting how many in each group.

Method 2 – Pupils are taught to solve problems including halving and sharing using objects (concrete representation).

Mental Strategies

- Develop a mental image of the number system.
 - Understand the value of a number.
 - Be able to solve verbal number stories involving halving and sharing.
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