A Guide to Maths Mastery in Year One

At Booker Avenue Infant School, we see teaching for mastery in Maths as allowing the pupils to gain a deep understanding of Maths, allowing them to acquire a secure and long-term understanding of Maths that allows them to make continual progress to move onto more complex topics.

We believe that everyone can do Maths and there's no such thing as a Maths person. Maths is a subject that everyone can and should be able to perform confidently and competently.

We choose to teach by breaking down Maths objectives into the smallest steps, so that every pupil is secure in every new concept before moving on. We focus upon teaching to gain fluency with Maths facts, reasoning about Maths and problem solving.

In Year 1, we aim to teach so that children have a deep understanding of number.

Representing Numbers

We want to develop children's number sense so that they understand the number rather than just recognising the numeral. Children need to understand that numbers can be represented in many ways, not just as a written numeral. We use many different objects and pictures to show that numbers can be represented in lots of ways.

Some ways to represent five.

Children sometimes need to continually work on recognising numbers in different forms, in order to embed it. We play matching games and encourage children to recognise and make different amounts. Seeing numbers in different contexts helps them to make connections and to generalise about concepts.

Number Bonds

Learning number bonds is of high importance in understanding Maths. Number bonds are pairs of numbers that go together to make another number. Once number bonds are learned they form the basis of many other calculations, for example if we know 5 + 2 = 7, we also know 50+20=70 etc. We can also learn the opposite (inverse), for example 7-2=5 and 7-5=2. However, these connections often do not come naturally to children and they need to be shown to them in many ways.

In Year 1 we need to learn lots of number bonds.

The number bonds in green should be known by the end of Year 1 with the ones in yellow left until Year 2. Although this looks a lot, if we know, for example 5+3, we also know 3+5. We use lots of ways of showing number bonds including using real life objects that we can physically move, physical and pictorial examples such as part whole models or bar models, through to abstract examples using the numeral.

+	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

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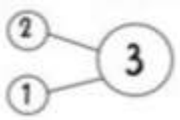
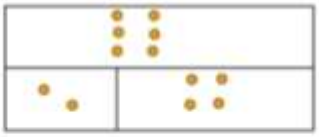
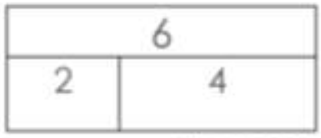




Part whole model

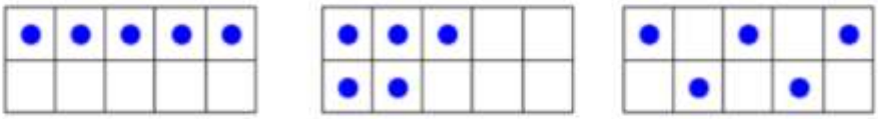


Bar models

Allowing children to compare using objects, pictures and numbers at the same time allows them to gain a much better understanding of what is happening with the numbers. It also leads into children being able to solve missing number calculations such as 6 = ? + 2.

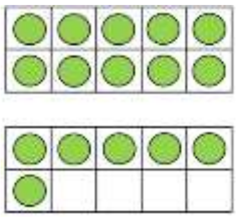
<u>Understanding that the total stays the same even when the objects move</u>

When children first start to add numbers, they often do not understand that if we move objects into another arrangement the total stays the same. We learn this with many different types of objects but a useful tool is using a tens frame to be able to move counters around.



<u>Partitioning Numbers</u>

Tens frames also help children understand seeing how teen numbers consist of a ten and a ones digit. 13 is made of a 10 and a 3.



<u>Reasoning</u>

Reasoning in Maths helps children to be able to explain their thinking, therefore making it easier for them to understand what is happening in the Maths they are doing, and to make connections to new concepts. It helps them to think about how to solve a problem, explain how they solved it and to think about what they could do differently. In Year 1, some examples of reasoning are:

- True and false statements.
- Spotting nonsense Maths calculations e.g. Tick the correct calculation. Explain why the others don't make sense. 2=2=4   2+2=4   2=2+4
- Explaining how we know something or how we worked it out.

Spotting Patterns

Children need to be taught to spot patterns in Maths. This often does not come naturally and generally needs to be specifically taught.

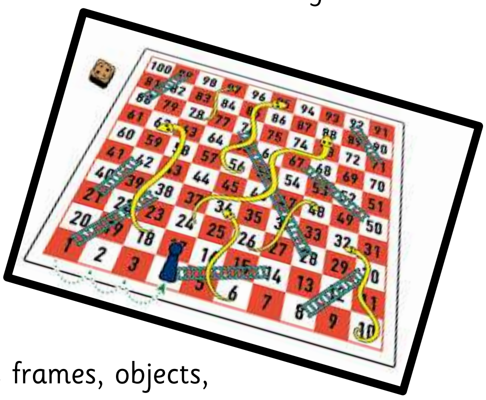
- Sharing objects between different groups – particularly when the number of groups change and the number of objects stay the same.
- Finding different ways to split number e.g. 9 could be 9+0, 8+1, 7+2 etc.
- Spotting addition patterns e.g. 5 + 1 = 6   5 + 2 =7   5 + 3 = 8

Problem Solving

Problem solving in Maths allows children to use their Maths skills in lots of contexts and in situations that are new to them. It allows them to seek solutions, spot patterns and think about the best way to do things rather than blindly following Maths procedures. In Year 1, problem solving might include:

- Choosing different ways to find answers.
- Solving 'puzzles'.
- Problems that involve trial and error.
- Finding all possible solutions

Fluency, reasoning and problem solving are not taught in isolation from each other. Lessons are carefully planned to interweave all three aspects in a cohesive teaching sequence to allow children to fully understand the concept being taught and to be able to make connections.



How can I help at home?

- Count in steps of 2, 5 and 10 eg using coins.
- Ask children to say how many objects without counting.
- Play games using a dice and encourage child to say how many spots without counting. Even better use two dice and either work on number bonds or count on from the first dice!
- Match different representations of numbers e.g. using dice, tens frames, objects, tallies etc.
- Deliberately make mistakes. Children need to understand mistakes are normal and everyone makes them e.g. saying 5 add 5 equals 9. Ask children to explain what you did wrong.
- Watch Numberblocks on Cbeebies. This programme is written by Maths specialists to model Maths concepts and represents number brilliantly.
- Hide numbers around the house or garden for children to find. Give children a total number they have to make and ask them to find two numbers to go together to make it.
- Play outdoor Maths games like hopscotch and skittles. Even better, let children make up their own games and decide how to score points.
- Read books with Maths concepts e.g. The Doorbell Rang, Equal Shmequal, 2 x 2 = Boo, What's the time, Mr Wolf?
- Draw attention to more than, less than and equal.
- Ask children to divide things into halves – halves of a whole such as pizza, halves of amounts, such as sweets etc.
- Ask questions such as "How many more?", "How many altogether?", "How many would I have if…?"