

## How can I help at home?

- Count in steps of 2, 5 and 10 e.g. 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 practise 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. Also, Numberjacks is excellent for solving problems.
- 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,  $2 \times 2 = \text{Boo}$ , What's the time, Mr Wolf?
- Draw attention to more, less 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...”
- Sing number songs; there are lots of songs for number bonds, counting in steps and doubles on YouTube.

Most importantly- have fun!

# A Guide to Maths Mastery in Year 1



**QUEEN'S HILL PRIMARY SCHOOL**



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- Answering Always, Sometimes, Never questions e.g. *Multiples of 5 always end in 5*
- explaining how we know something or how we worked it out

## Spotting Patterns

Children need to be taught to spot patterns in numbers and number calculations. 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 stays the same
- finding different ways to split numbers 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

## Recognising doubles

Knowing doubles of numbers is a really useful skill. We practise doubles by using a set of objects and adding a mirror to see how the amount is doubled. We can use fingers to show doubles up to 5+5. Using dice can show doubles to 6+6 so playing games that use two dice can be very effective.

Once children are familiar with doubles it is then easy to work out 'near doubles', e.g. I know  $5 + 5 = 10$  so  $5 + 6 = 11$  as it's adding one more.

## Counting in steps of 2, 5 and 10

Being able to count in steps of 2, 5 and 10 rather than just steps of one, helps children to become familiar with multiples and links to learning times tables. It also helps with recognising odd and even numbers.

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*By becoming fluent in maths facts, it allows our brain to concentrate on higher level skills.*

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## Reasoning

Reasoning in maths helps children to be able to explain their thinking, making it easier for them to understand what is happening in the maths they are doing. 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 e.g. if I add zero to a number it makes it bigger
- spotting incorrect maths calculations eg  
*Tick the correct calculation. Explain why the others don't make sense.*

$$2 = 2 = 4 \qquad 2 + 2 = 4 \qquad 2 = 2 + 4$$

## What is Teaching for Mastery?

### Our Definition



At Queen's Hill Primary School we see teaching for mastery in maths as allowing the pupils to gain a deep understanding of maths, allowing them to gain a secure and long-term understanding of maths that allows them to make continual progress to move onto more complex topics.

### Our Ethos



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.

### Teaching for Mastery



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 for fluency, reasoning and problem solving.

## National Curriculum in Year 1

This is what most children in Year 1 are expected to be able to do by the end of their school year.

### Number - number and place value

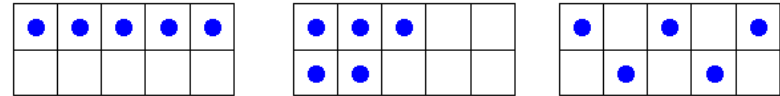
- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s
- given a number, identify 1 more and 1 less
- identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- read and write numbers from 1 to 20 in numerals and words

### Number - addition and subtraction

- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including 0
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as  $7 = ? - 9$

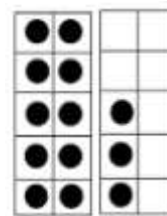
### Understanding that the total stays the same even when the objects move

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 practise this with many different types of objects but a useful tool is using a tens frame to be able to move counters around.



### Partitioning numbers

Tens frames also help children understand seeing how teen numbers consist of a ten and a ones digit.



For example

13 is made up of 10 and 3

### Spotting connections between numbers

Understanding how a teen number is composed alongside using number facts means children are able to add mentally

e.g. I know  $5 + 3 = 8$  so I know  $15 + 3 = 18$

Knowing addition facts means we also know the corresponding subtraction facts.

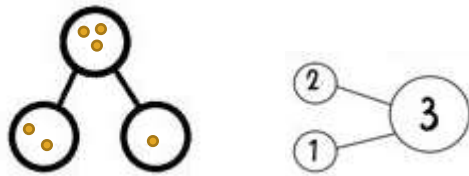
$$5 + 3 = 8 \text{ and } 3 + 5 = 8 \text{ so } 8 - 3 = 5 \text{ and } 8 - 5 = 3$$

In Year 1 we need to learn lots of number bonds

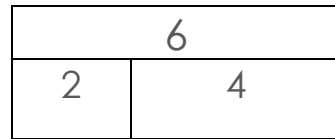
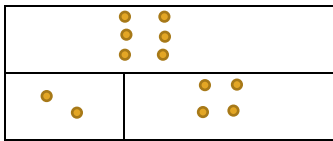
+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	1+10
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9	2+10
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9	3+10
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9	4+10
5	5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9	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

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.



Part whole models



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  $6 = \square + 2$ .

## Number – multiplication and division

- solve one-step problems involving multiplication ( $\times$ ) and division ( $\div$ ), by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

## Number - fractions

Pupils should be taught to:

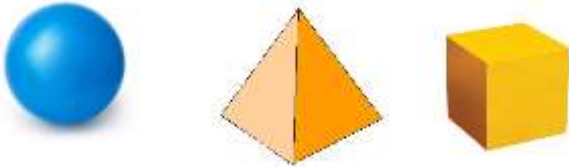
- recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity
- recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity

## Measurement

- compare, describe and solve practical problems for:
- lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
- mass/weight [for example, heavy/light, heavier than, lighter than]
- capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
- time [for example, quicker, slower, earlier, later]
- measure and begin to record the following:
  - lengths and heights
  - mass/weight
  - capacity and volume
  - time (hours, minutes, seconds)
- recognise and know the value of different denominations of coins and notes e.g. 2p, 5p, £2, £5
- sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
- recognise and use language relating to dates, including days of the week, weeks, months and years
- tell the time to the hour (i.e. 3 o'clock), and half past the hour (i.e. Half past 3) and draw the hands on a clock face to show these times

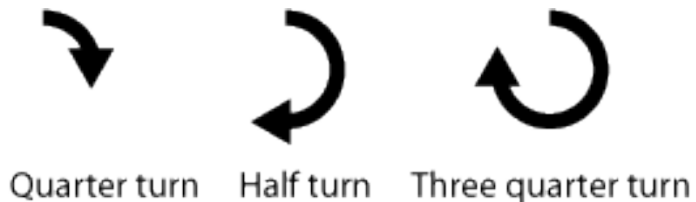
## Geometry – properties of shapes

- recognise and name common 2-D and 3-D shapes, including:
  - 2-D shapes [for example, rectangles (including squares), circles and triangles]
  - 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]



## Geometry - position and direction

- describe position, direction and movement, including whole, half, quarter and three-quarter turns



## How do we teach for Mastery in Year 1?

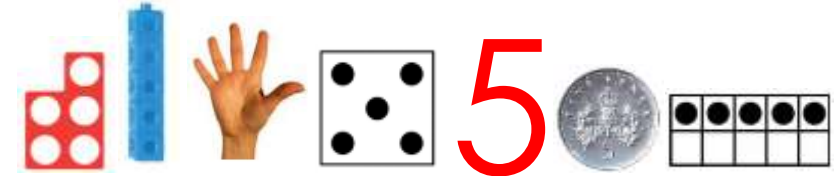
### Fluency

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 lots of practice to recognise numbers in different forms. We play matching games and encourage children to recognise and make different amounts in our indoor and outdoor areas.

### 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  $50 + 20 = 70$ ,  $500 + 200 = 700$  etc. We can also know the opposite (inverse), for example  $7 - 2 = 5$  and  $7 - 5 = 2$ . However, these connections often do not come naturally to children and need to be shown to them in many ways.