Knowing Numbers to 20

A child's first introduction to number:

When exposing children to the numbers 1 to 10, in order to create an in depth understanding of what they are and what they represent, it is vital that they experience each one in all its guises. That is, that they encounter the numbers in the various different forms they pertain to. The number 5, for example, represents ***5 things***, and there are endless opportunities in the world around us to reveal this structure to children.




But this is by no means a complete picture of the number 5. The 5 on a clock, for instance, does not denote 5 things, nor does the 5 on my front door necessarily mean I have 5 of them! This is because numbers are also used to put things in order and the knowledge that 5 comes after 4, but before 6, is equally important to understand. Therefore, this aspect of number must also be regularly exposed to the children so that they are able to, for example, locate the correct page in a book, look up a date in the calendar, or know how old they will be next year.

Below is a list of simple activities that can be carried out at home, or on the way to school, to help your child grasp these different concepts of number:

- Count sets of 5 things at home, or outside.
- Encourage your child to spot the number 5 whenever you are out and about.
- Tell your child to show you 5 fingers whenever they want your attention at home.
- Write down some numbers and ask them to point out the number 5.
- Get them to locate page 5 in a book.
- Can they then find a word with 5 letters?

- Tell your child to count as they go up 5 stairs. Are they able to count backwards as they come down again? You could do this with paving stones too.
- Ask them to draw a set of 5 dots in lots of different arrangements.
- Get them to draw a monster with 5 heads, 5 legs and 5 tails.

Teen Numbers

Our number system, for the most part anyway, follows a very repetitive structure and a secure knowledge of tens, hundreds, thousands etc., and the pattern they follow, would enable you, if you had to, to continue counting on and on, into infinity. However, the numbers 11 to 19, or the 'teen numbers' as they are commonly referred to, do not follow this structure and have instead been assigned an arbitrary collection of names - ones which don't appear to follow any recognisable pattern. It is for this reason that much more time must be dedicated to helping children familiarise themselves with the teen numbers and their associated structures and names. Common errors to look out for include confusing the names *twenty* and *twelve*, reciting the names in the wrong order, or omitting some altogether, or recording them incorrectly based on how they are said (e.g. sixteen written as 61). Children should also be corrected if they say, for example, that the number eleven is a 1 and a 1, and discussions should be had about the first 1 actually being a ten.

Concrete Resources

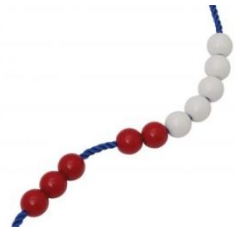
Several physical resources are used to help children learn the 'shape' of numbers. Numicon, which children are introduced to as soon as they start school, is ideal for this purpose as the way in which it presents numbers immediately highlights many of their properties. For instance, children can visually see their relative size, and use them to identify which numbers are one more, or one less, than another. The concept of odd and even is also very apparent.

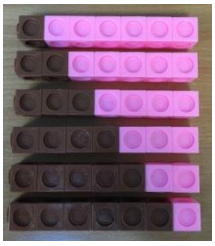
But another key feature of this resource is its ability to draw attention to the component parts of a number. There is an expectation that children will know all of their number bonds within 20 by the end of Year 2 (e.g. that 5 = 0 + 5 = 1 + 4 = 2 + 3 = 3 + 2 = 4 + 1 = 5 + 0) and familiarity with Numicon can really help embed this knowledge.

The pictures below show some of the different ways we can make the numbers 6 and 7.

However, Numicon is not the only effective model and image for mathematics and several other resources are used in the classroom as well, not least to ensure children don't just think that numbers come in the shape (and colour!) that are represented by Numicon.

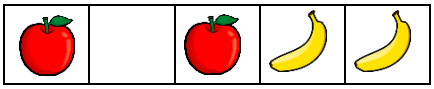
Bead strings, particularly with their purposeful use of colour, also create a visual image of number, as do trains of multilink cubes, or the slightly more abstract Cuisenaire Rods.

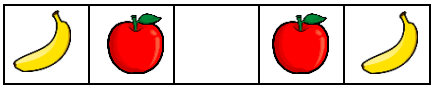




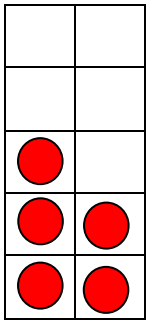
The five and ten frames, easily replicable rectangular frames used alongside counters or objects, illustrate essential characteristics of numbers too.

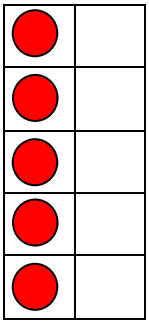
Below, the five frame is being used to demonstrate important aspects of the number 4: that it is made of 1 and 3 or 2 and 2, that it is one less than 5, and that it is still the same number, even if the objects move position.

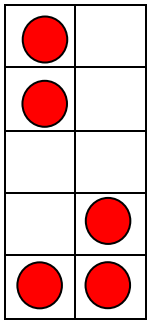




The examples of the ten frame here all show something different about the number 5 too.

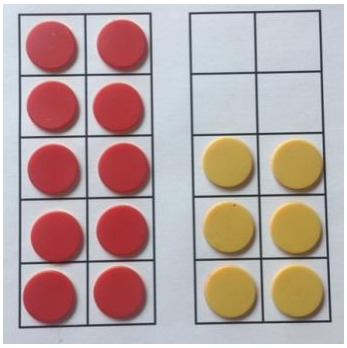






Unlike Numicon, this resource also makes apparent a number's relationship to the number 10.

Many concrete materials are used to emphasise the central feature of teen numbers too – that they are composed of a ten and a ones number.



Subitising

Subitising is the ability to instantly recognise the number of objects in a small group, without counting them. Most adults can subitise up to 5 objects; for sets of items beyond that, we tend to break them up into smaller groups (perhaps seeing two sets of 3 for a group of 6 objects). When cultivating a sense of number in children's early years of school, it is essential that they are given plenty of opportunity to develop this skill of subitising. The resources above, particularly the five and ten frame, are an ideal way to do this.

But before you delve into the list of activities below, which have been provided to help you develop your child's number sense, it is important that you bear in mind the following: although these resources are a brilliant way of enabling your child to visualise the maths, we need to ensure they don't become over reliant on them. That is, that they are so dependent on the apparatus that they are unable to do the maths without them. In order to prevent this, we must at some point encourage children to picture the resources mentally instead. Eventually they should get to the point where they no longer require them at all.

Activities and Games:

- Use a feely bag with Numicon to describe a secret number. *'It has four holes down one side and a bit that sticks out at the end. What number is it?'* You could swap roles with your child too and encourage them to describe the shape instead.
- Get your child to close their eyes and then pass them a Numicon shape or a Cuisenaire rod. Without looking, they must say what number it is. Alternatively, they can show you the shape they have felt using counters. This is a great way to encourage visualisation.

- Place the Numicon pieces, or Cuisenaire rods, in order and then hide one. Which one is missing?
- Ask children to make a particular Numicon shape using counters.
- Can you use the bead string to show me a number that is one less than 13? Or could you draw what the bead string would look like?
- Make pictures using only odd or even numbers.

- Give children a handful of objects which they must arrange into a five or ten frame to see how many there are. They could estimate the number first, but they should not count them.
- Repeat the activity above, but without the frame. Can children say how many objects there are without counting? Can they explain how they know?
- Bake some cakes in the shape of Numicon.

- Say a number orally, or show it using digits. Get your child to make this number using one of the resources, such as a ten frame, or with a bead string. Focus particularly on 'teen' numbers.
- Make, and then play, a matching game, where players have to find a number in digits, words and the ten frame shape.
- Show your child a Numicon shape or a number using the Cuisenaire rods or on a bead string; they must write down what it is in numerals.
- Use a pile of socks to get your child to help you decide whether you have an odd or even number. Can they find all the odd/even numbers up to 20? How do they know if a number is odd or even?
- Put all of the Numicon shapes in a feely bag. Challenge your child to pull out all of the odd/even numbers without looking. To make this activity more challenging, try it with Cuisenaire rods.
- Choose any number between 10 and 20 and ask your child to count from this number up to 20 and then back again. Counting backwards can be particularly difficult.
- Board games, notably those that use number tracks such as Snakes and Ladders, are great for early number recognition and counting too.

This is certainly not an exhaustive list of activities, and many more ideas can be found by searching online. You may even find you have the confidence to create some of your own.