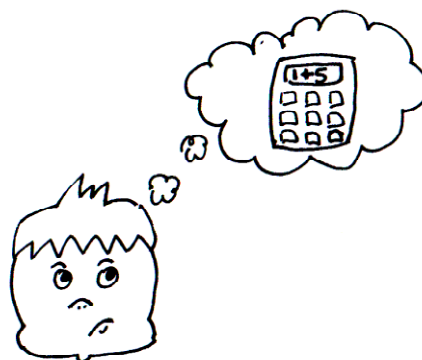


Support your junior child in maths

In your head, please!

We would all agree that we want our children to be numerate. But what does this mean? Well, it means that we want them to be able to work things out in their heads, and also to be able to do sums on paper if they need to. In real life, MOST calculations are fairly easy and actually we need a fast approximate answer. For example, if we are buying three pizzas at £4.99 each, we need to know that this will cost about £15. It follows that it is crucial that children can do such calculations swiftly and easily, with confidence. Therefore teachers nowadays are most concerned to make sure that children can manipulate numbers in their heads! Before they move children on to doing written procedures (what we used to think of as written sums) we need to make sure that children can move around the numbers without any problem - adding ten or one hundred or numbers close to that (e.g. $345 + 69$ is $345 + 70$ (415) - 1) and rounding numbers to get an approximate answer (e.g. spending £6.49 out of £10 leaves about £3.50). Keeping maths mental for longer helps children to develop a really good sense of how numbers work - and that means that they are better at doing the written calculations in the end - and a lot more confident!



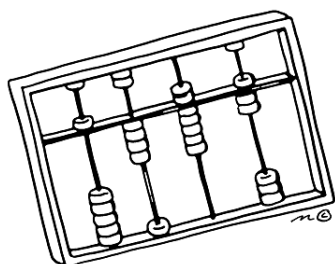
Confident mathematicians

To be confident in number means having three things:

A really good understanding of how numbers work (see next section)

A good memory for number facts (see section 4)

Some images in our heads on which we can draw to help us work out what is going on!

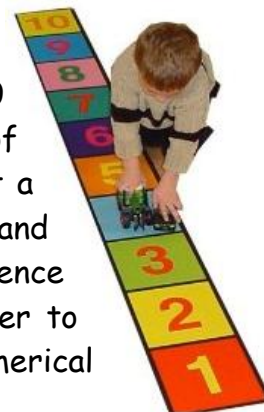


Maths is an abstract subject. To calculate effectively, especially as the calculations get longer and harder, it is essential to have some images or models to help us! Take the calculation, $62 - 57$. We need children of 8 years and older to be able to do this mentally (in their heads). The mental image of a number line is extremely useful.

Shut your eyes and picture the numbers on a line going from one to one hundred.

Now zoom in on the section around 60. If 60 is in the middle of your 'close-up', there is 57, 58, 59 before it, and 61, 62, 63 etc. after it. Focus on 57. We count along three steps to 60, and two more steps to 62. That's five steps in all. So $62 - 57 = 5$.

Helping children to internalise helpful mental images such as the number line, or models such as a 1-100 number grid or place value cards, is very much part of helping them develop an understanding of number. Put a number line from 1-100 up in your child's room, and occasionally take turns to practise finding a difference between two numbers by counting on from one number to the next. This is truly excellent in developing numerical fluency.



How do numbers work?

At the root of many - even most - of the difficulties that children have with mathematics, is a lack of understanding of how the number system works. Teachers call this concept 'place value'. It can be summarised as the idea that in the number two hundred and twenty-two, the first two has a different value from the second two because of its place. The first two is worth 200, the second two is worth 20, and, of course, the third two is worth only two! The place that a number occupies tells us its value. This is the genius of the number system we have inherited from the Hindus and the Arabs - we only need ten symbols (0-9) to write any number no matter how large or how small! Thus 56,300 is written using the same digits as 0.0635 but they are totally different and one is about a million times larger than the other! If children do not understand that 220 is ten times larger than 22, and that 505 has no tens digit whereas 550 has no ones digit, then pretty much all their calculations will come to grief. Use images such as ten sweets in a tube, ten tubes in a box to



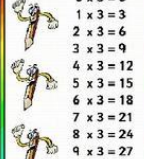
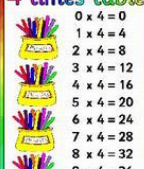
reinforce the idea of ones, tens and hundreds and to make sure that your child really understands this concept. If in doubt, talk to the teacher for more help, and also look for activities on place value in our [Magical Maths](#) section in [Things2Do/Busy not Bored](#).

Number facts

Like most school subjects, mathematics has certain facts which need to be memorised or learned by heart. Children who know these facts, and who do not have to think about them or work them out will be at a GREAT advantage in their mathematics. Almost all calculation and a great deal of advanced maths depends upon having these number facts at the tips of their tongues! So which are the really crucial number facts that we should really help our children to memorise?

First the addition facts to ten. This means knowing all the pairs of numbers that make ten ($5 + 5$, $6 + 4$, $7 + 3$, $8 + 2$, $9 + 1$) and all the pairs of numbers which make the numbers up to ten ($3 + 3 = 6$, $5 + 3 = 8$, $7 + 2 = 9$, etc). It is impossible to exaggerate how much difference it makes if children know these facts securely by the time they are seven. Teachers call these facts 'number bonds to ten'. Do help your child to learn all these facts totally by heart. Play memory games using cards, spot two car numbers adding to ten or a hundred on journeys and have a look at some of the number activities in our Busy not Bored/Things2Do section of this site. Once children know that $3 + 7 = 10$, they will also recognise that $57 + 3 = 60$ and that $300 + 700 = 1000$ and that $£4.70 + 30p = £5$. So many doors are opened for children's understanding of numbers once they know these number facts.

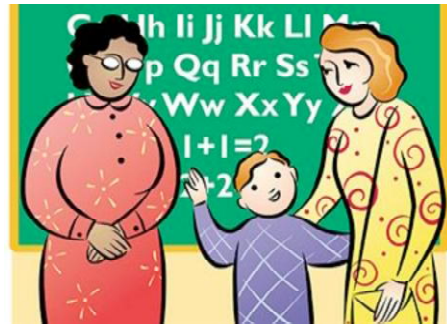
Tables and doubles

2 times table  $0 \times 2 = 0$ $1 \times 2 = 2$ $2 \times 2 = 4$ $3 \times 2 = 6$ $4 \times 2 = 8$ $5 \times 2 = 10$ $6 \times 2 = 12$ $7 \times 2 = 14$ $8 \times 2 = 16$ $9 \times 2 = 18$ $10 \times 2 = 20$	3 times table  $0 \times 3 = 0$ $1 \times 3 = 3$ $2 \times 3 = 6$ $3 \times 3 = 9$ $4 \times 3 = 12$ $5 \times 3 = 15$ $6 \times 3 = 18$ $7 \times 3 = 21$ $8 \times 3 = 24$ $9 \times 3 = 27$ $10 \times 3 = 30$
4 times table  $0 \times 4 = 0$ $1 \times 4 = 4$ $2 \times 4 = 8$ $3 \times 4 = 12$ $4 \times 4 = 16$ $5 \times 4 = 20$ $6 \times 4 = 24$ $7 \times 4 = 28$ $8 \times 4 = 32$ $9 \times 4 = 36$ $10 \times 4 = 40$	5 times table  $0 \times 5 = 0$ $1 \times 5 = 5$ $2 \times 5 = 10$ $3 \times 5 = 15$ $4 \times 5 = 20$ $5 \times 5 = 25$ $6 \times 5 = 30$ $7 \times 5 = 35$ $8 \times 5 = 40$ $9 \times 5 = 45$ $10 \times 5 = 50$

Of course memorising or learning our times tables are important as well. Although it is good to stress that knowing these is no where near as crucial as knowing the number bonds to ten. However, it certainly does help children as they get towards the end of their primary education if they have a secure memory of the times tables up to 10×10 , and also - equally if not more important - the doubles of all the numbers from 1 to 20. Help your child to memorise these tables facts and their doubles. Take a focus each week - and write this in a prominent place so everyone knows. This week is 7x table week, or this week is doubles week. Together write out the relevant table facts and pin them up in the bathroom NEXT to the loo! At any odd moment, ask for a fact. Does anyone know what six sevens are? And play games together based around these facts (see Magical maths in Things2Do/Busy not Bored).

How do they do their sums nowadays?

One of the most difficult things for a parent nowadays is to fathom out how best to help a reluctant child with their sums when we are not even sure how they do these nowadays. The first rule of thumb is to listen! Don't be tempted to start with, 'This is how you should do sums like this...!' But rather, ask your child, 'How does your teacher ask you to do these? Can you remember?' Mostly teachers will use a method which has a visual image such as a number line or grid associated with it to help children visualise what is going on. It is definitely worth popping into school or writing a note to ask if you can look at an example of the method of doing a particular sum on which your child is stuck. That way you and the teacher will be singing from the same hymn sheet rather than contradicting each other and totally confusing the child with two different methods.



Playing with numbers!



Once children have done a certain amount of maths they can become interested in numbers - and, as parents, we should do everything we can to encourage this! Numbers are magical. If you start at two, and you keep on doubling, eventually you get to 1024! How far can you go? Did you know that the answer to 13×13 is the same answer as to 31×31 but in reverse! Some numbers, like 17, are special because nothing will divide evenly into them without leaving a remainder except themselves and one. These are called Prime numbers, and are in some ways the building blocks of mathematics. Any number can be made by adding prime numbers. E.g. 61 is a prime number and it can be made by adding $3 + 29 + 29$ or $1 + 31 + 29$, etc. Some numbers are 'perfect' in that if you add the numbers that go into them, you get the number itself (6 is $3 + 2 + 1$). And if you add the digits of any large number, you can tell if it divides by three or by nine because its digits add to a number in the three or nine times table! Explore numbers with your child. Encourage them to notice patterns. Add up or multiply numbers just to see what happens! You'll be surprised how much just playing with numbers is responsible for brilliance at maths at a later stage!