TEACHING MENTAL ADDITION STRATEGIES– 2

Often when we do addition problems in Maths, there is only one correct answer. The way that each of us arrive at the solution though, can vary considerably! Take the example of 5+5. If I wrote this equation on the board and asked a class of students to solve it, I would be hoping that they would all end up with 5+5=10. If I then asked each child how they went about solving it, chances are that I would get a range of responses. However, some of the strategies used by the children to solve this equation, would most likely be more efficient than others.

If we wanted an efficient way to solve 5+5, as in the example above, it would be extremely beneficial to know our 'doubles'. 'Doubles' are addition equations, where numbers are added to themselves. Examples of these include: 1+1, 2+2, 3+3, 4+4, 5+5, 6+6, 7+7, 8+8, 9+9, 10+10, 11+11, 12+12, etc. A child, who can automatically recall their 'doubles' facts, can efficiently answer any of these equations.

Once a child has automatic recall of their 'doubles' facts, they can then utilise the mental strategy 'near doubles'. As the name suggests, 'near doubles' can be used when an equation has numbers that are near one another, such as 3+4. You can solve 'near doubles' problems by doubling a number and either adding one or taking one away. Using the example 3+4, you can either double the three and add one (3+3+1) or double the four and take one away (4+4-1). 'Near doubles' is only an efficient addition strategy however, if a child has memorised their 'doubles' facts.

Another mental addition strategy that requires children to memorise facts is called '10 facts'. 'Ten facts' or 'pairs to ten' as they are sometimes called, are pairs of numbers that add up to ten. There are eleven '10 facts', which include: 0+10, 1+9, 2+8, 3+7, 4+6, 5+5, 6+4, 7+3, 8+2, 9+1 and 10+0. If a child can memorise these facts, then an equation such as 6+4, 2+8 or 7+3, can be answered very quickly and easily.

Once a child has mastered the automatic recall of '10 facts', they can then be taught a more complex mental strategy called 'build to 10', 'make 10' or 'bridge to 10', as this strategy can also be called. 'Build to 10' utilises a child's ability to 'partition' - break a quantity into parts. If we wanted to solve the problem 8+5, there are two ways that we could 'build to 10'. Firstly we could partition the number five into 2+3. This would mean that we could add (8+2)+3. Secondly we could partition the number eight into 5+3. We could then add (5+5)+3. If we can partition numbers so that we can 'build to 10' in our minds, it is easy to add another number to ten.

Likewise, children are taught to 'add 10'. Once a child gains an understanding of the pattern that is created when counting by tens, they can then go on and 'add 10'. When using two-digit numbers to count by tens, the first or 'tens' number increases by one and the second or 'units/ ones' number remains the same. An example of this is: 6, 16, 26, 36, 46, 56, etc. Therefore when solving 32+10, a child with knowledge of this pattern would know that that 32+10=42 because the one's number (which is 2) stays the same and ten's number increases by one from 30 to 40.

When a child can confidently 'add 10', they can then be taught the mental addition strategy 'add 9'. To 'add 9', you must first 'add 10' and then take away one. An example of this is 12+9. First you would think 12+10=22. However, nine is one less than ten so 22-1=21. Therefore, 12+9=21.

So when it comes to a child efficiently adding numbers together, there is not 'one strategy' used to solve all equations. Children need to be able to move beyond an over-reliance on 'count on' (see Part One of this article) and utilise a variety of mental strategies, depending on the combination of numbers that need to be added. Memorisation is required for strategies such as 'doubles' and '10 facts'. Understanding concepts such as 'partitioning', can assist children in mastering some of the harder strategies such as 'near doubles', 'build to 10', 'add 10' and 'add 9'. Ultimately though, for a child to efficiently add numbers, they need to be able to have access to a variety of strategies and be able to recognise and apply the most efficient strategy required, to solve each problem.