Key maths concepts in Year 2

Commutative and non-commutative operations

Commutative operations are those where changing the order of the numbers in the calculation doesn't affect the answer (for example, 2 + 4 = 6, and 4 + 2 = 6). In Year 2, children meet the idea that some mathematical operations are commutative, whereas others are not. It's helpful to give children lots of examples so that they can begin to understand and make this connection for themselves, using objects and pictorial representations as well as written calculations.

Addition and multiplication are commutative:

- 6 + 5 = 11, and 5 + 6 = 11

- 4 × 3 = 12, and 3 × 4 = 12

Children can be encouraged to check that this is true for a wide range of multiplication and addition facts. Using concrete objects such as blocks is a good way to demonstrate that the outcome of addition is always the same , whether you start with for example with 6 blocks and add 5 blocks or vice versa. Similarly, for multiplication, make an array of 4 rows of 3 blocks and then walk around it to see that it is also 3 rows of 4 blocks.

Subtraction and division are non-commutative:

- 5 − 3 does not come to the same as 3 − 5

- 6 ÷ 2 does not come to the same as 2 ÷ 6

As children haven't met negative numbers yet, it isn't necessary to go into detail about the results which give answers in negative numbers – you could say *oh, we haven't got enough to take away five'* or *we'll have to cut the sweets up is we want to divide two sweets between six people*.

Inverse relationships

If two mathematical operations have an inverse relationship, this means that one operation 'undoes' the other (for example, 3 × 6 = 18 can be undone by performing the operation 18 ÷ 6 = 3). This is a concept which children first meet in Year 2, when the idea is introduced that there is an inverse relationship between addition and subtraction, and between multiplication and division.

Children should become familiar with the idea that, for example, you can check the answer to a statement like 2 × 10 = 20 by calculating 20 ÷ 2 = 10, or 20 ÷ 10 = 2. In the same way, you could check 2 + 10 = 12 by calculating 12 − 2 = 10 or 12 − 10 = 2. Plenty of practice is helpful in ensuring that children become fluent in using inverse relationships to check their calculations, and it helps to use concrete objects to demonstrate what is happening visually.

Linking division with fractions

In Year 1, children encountered the idea that division is related to the concept of grouping and sharing quantities (for example, 12 can be divided into 4 groups of 3, or 3 people can share 12 things by getting 4 things each). The idea of sharing can also be used to make a link between division and fractions – so 16 divided (or shared) by 2 is 8, and 8 is half of 16. Again, it will help to use concrete objects to demonstrate this, so children can see that dividing a number of objects by 2 is the same as splitting the group of objects into two halves.