

**Division:** Know  $12 \div 3$  is not same as  $3 \div 12$ , etc. ‘Not commutative’.

**NB** although we are using the terms ‘commutative’ and ‘not commutative’, it is not necessary for the child to know these words. More important that they can explain the concept.

### Division as sharing or grouping

*You will need a whiteboard and marker, some counters.*

It is helpful if this activity is done after the sessions on “multiplication is commutative” so that they have a frame of reference. It’s also important that they have had some exposure to division. Remind the child about addition and multiplication sums being able to be done in any order, perhaps do a quick example, and explain that division and subtraction cannot.

Give a simple division sum such as  $6 \div 3$ . This could be illustrated as a word problem to encourage the child to use practical apparatus and models and images to help work out and solve the problem. Use grouping *and* sharing word problems.

- Grouping: There are 6 cakes and I want to put 2 cakes on each plate. How many plates?
- Sharing: There are 6 cakes and I want to share them between 3 children. How many each?

Draw 3 circles on the whiteboard and remind the child that when we divide by 3, we are sharing items into 3 groups. It’s important that they see the “divisor”, in this case 3, as the number of groups. Encourage the child to share 6 counters equally (and methodically) into the 3 circles and count how many are in each at the end. See image below:



The child can see that 6 has been split into 3 equal groups with 2 in each group. They can now write the number sentence  $6 \div 3 = 2$

### What happens when you reverse the order?

Take the same word problem as above and reverse it, so that it requires  $3 \div 6$ . Remind the child that the “divisor” is the number of groups, in this case 6. Repeat the process, sharing out 3 counters into 6 circles on the whiteboard. The child should be able to see they can’t share the counters equally and that the answer cannot be the same. Repeat with different sums and help the child to see that division has to be done in a certain order, different from multiplication.

### Greater number first

Build a few examples, such as  $6 \div 3 = 2$ ,  $8 \div 2 = 4$ ,  $10 \div 2 = 5$ . Make sure they can see that the order matters in each case. Ask them if they can see a pattern with the examples, and help them see that it is always bigger number  $\div$  smaller number. (Or equal numbers  $3 \div 3 = 1$ .)

To show them why this is so, ask them to make their own sharing problem with cakes, but with more children than cakes. Say 5 children and 4 cakes. Show them that if they try to give even 1 cake to each child they run out of cakes. That is why you need the number of cakes to be greater than or equal to the number of children for the sharing to work.