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INVESTIGATION

One to Four

$$1 = \frac{4 + 2}{3} - 1$$

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One to Four

In this investigation we are going to see how many numbers we can make using the digits 1, 2, 3 and 4.

We can use any normal mathematical symbols such as $+ - \times \div ( ) \sqrt{\ }^2$
We can also use two or more numbers to make a fraction.

The investigation is in two parts:

Part 1. Use any or all of the digits 1, 2, 3 and 4 to make the numbers.

Here are some to get you going:

$1 = 1$

$2 = 2$

$7 = 1 + 2 + 4$

If you can get up to 20 you are doing very well.
How far past 20 can you get?

Can you find any numbers that can be done in more than one way?

Eg. 1 can also be written as: $4 - 3$

Part 2. This is the same as part 1, but this time you must use all the digits 1, 2, 3 and 4 to make each number.

Here are some to get you going:

$1 = \frac{4 + 2}{3} - 1$

$2 = 4 \times 2 \div (3 + 1)$

$5 = 3 + 4 - (2 \div 1)$

Answer Guide

This is quite an easy investigation and very good practice in juggling symbols and numbers.

The important idea to establish with children is the order of operations usually called BODMAS (brackets, of, division, multiplication, addition, subtraction). This determines the order in which operations are carried out.

In other words, anything in brackets is done first, then anything involving of (which is really multiplication in disguise), then division and multiplication and, finally, any additions and subtractions.

So $6 + (5 + 3) \times 7 - 6 + (5 - 2)$ is calculated as follows:

$6 + 8 \times 7 - 6 + 3$

$= 6 + 56 - 6 + 3$

$= 59$

If you are not familiar with this idea and would like more information, please see the module on BODMAS under year 6 worksheets on the CD.