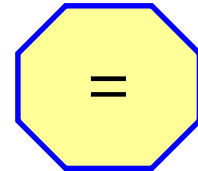
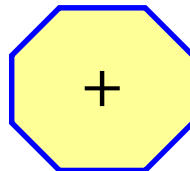
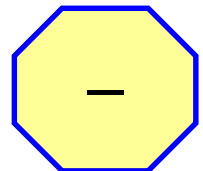
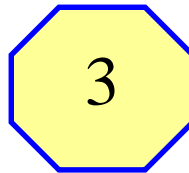
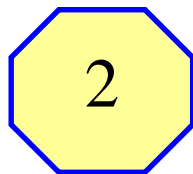




INVESTIGATION



Terrific Twenty



MathSphere

Terrific Twenty Investigation

Starter

Using only 3, 2, +, – and = can you make all the whole numbers up to 20?



Now, you can use each number and sign as many times as you like!

Have a go!!

Here is a start for you:

$$3 - 2 = 1$$

Try to find a sum for each number up to twenty.

It might be a good idea to work systematically, but you might find that some answers come up whilst looking for others - make sure you include them.

Some Ideas

Work in a methodical way, recording your results carefully as you go.

Think about how to set your results clearly. You may want to make up your own table, or ask your teacher for one ready to put answers in.

Have you found answers for each number up to 20?

Can you find more than one way of getting some numbers?

Try to find two ways of getting each number:

For example: $2 + 2 - 3 = 1$

What would happen if you tried to go up to 30?

What would happen if you started with different numbers eg 3 and 4?

What would happen if you were allowed to multiply as well?

Make 20 - table of results.

	= 1
	= 2
	= 3
	= 4
	= 5
	= 6
	= 7
	= 8
	= 9
	= 10
	= 11
	= 12
	= 13
	= 14
	= 15
	= 16
	= 17
	= 18
	= 19
	= 20



Answer Guide

Children enjoy this investigation as they can have some success very early on, finding solutions to numbers quickly.

It needs to be emphasised that the numbers and signs can be used more than once, and in most cases have to be used more than once.

Encourage working in a systematic way, but also to look out for unexpected answers eg when trying to find a way of getting 8, finding 9 or 10.

Because the signs are only addition and subtraction the order they are written down is less important than if multiplication is used.

Working in a small group is ideal for this investigation, sub-dividing the task between two or three children, or each member of the group trying to find different ways of reaching the same answer.

For those children who complete the task more quickly then the sequence can be extended to thirty, or more. Also the starter numbers can be changed - keeping to two consecutive numbers is helpful.