



*I wonder how often you have noticed numbers that follow one after another: 1, 2, 3 ... etc.? Sometimes they appear in reverse order when a countdown is happening for a launch of a rocket. But usually they happen in order going up, like when you read through a book and notice the page numbers. These kinds of numbers - whole numbers that follow one after another - are called consecutive numbers.*

*This investigation uses the idea of consecutive numbers and gives us other numbers to explore. You may very well discover things that no-one else has discovered or written about before, and that's great!*

**This is how it starts.** You need to choose any four consecutive numbers and place them in a row with space between them, like this:

4 5 6 7

When you've chosen your consecutive numbers, stick with the same ones for quite a while, exploring different ideas before you change them in any way. Now place + and - signs in between them, something like this:

$4 + 5 - 6 + 7$

$4 - 5 + 6 - 7$

and so on until you have found all the possibilities. Are you sure you've got them all? You should include one using all pluses and one that includes all minuses.

Now work out the answers to all your calculations (e.g.  $4 + 5 - 6 + 7 = 12$ ).

Next, try other sets of four consecutive numbers and look carefully at the sets of answers that you get each time.

Are you surprised by anything you notice?

It is probably a good idea to write down your 'noticings'. This can lead you to test some ideas out by starting with new sets of consecutive numbers and seeing if the same things happen in the same way.

You might now be doing some predictions that you can test out...

Finally, it is good to ask the question "I wonder what would happen if I ... ?"



# Consecutive Numbers

You may have thought up your own questions to explore further. Here are some we thought of:

"What would happen if I took the consecutive numbers in an order going down, instead of up?"

"What would happen if I only used sets of three consecutive numbers?"

"What would happen if I used more consecutive numbers?"

"What would happen if I changed the rule and allowed consecutive numbers to include fractions or decimals?"

"What would happen if I allowed a + or – sign before the first number?"