**On March 16th, we gave you two mathematical tasks to do, with the focus on how questioning and prompting helped, or hindered, your work. We said we would give you some ideas about the tasks after you have had a few more days to dwell on them. Here we go:**

**Ideas for thinking about Task 1:**

You started with a number in the three times table and numbers each side of it, which you squared and subtracted and eventually found that you got '4 times something'. I would write these numbers as *3n+1* and *3n-1*. In these I am using the fact that any multiple of 3 can be written as *3n*. [Extension: You might try and find out what will happen for any multiplication table, with any size jump each side. So if *kn* is any number in the *k* times table, then I am going to square and subtract the numbers *kn+d* and *kn-d* and predict what I will get.]

You were asked to 'explain' - that was the problem. Well it depends how far you have gone in your generalisation and whether you extended the investigation what you have to explain. Some people said they had generalised the difference as *4k*, but you have to be able to say what *k* stands for in this generalisation. And if you have tried all multiples of 3 in order, you will have got: 12, 24, 36 ...... There is more that can be said about this sequence than 'they are 4 times something'.

Grid multiplication would help you with the squaring. I know that the current minister for education doesn't like grid multiplication, but it happens to be a very useful and powerful tool for multiplying, so don't throw it out. Here are the grids for squaring *3n+1* and *3n-1*. If you subtract the cells of the second grid from the cells of the first grid you will get 4 times whatever your chosen multiple of 3 was.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *x* | ***3n*** | ***+1*** |  | *x* | ***3n*** | ***-1*** |
| ***3n*** | *9n2* | *+ 3n* |  | ***3n*** | *9n2* | *-3n* |
| ***+1*** | *+ 3n* | *+ 1* |  | ***-1*** | *-3n* | *+1* |

You might wonder why the multiplication table matters for a generalisation, because you might have been able to explain '*4k'* without using the fact that you were in the three times table. Try choosing a number from the five times table and the numbers that are 4 steps each side of it. *5n + 4* and *5n - 4*. Square and subtract. You get 4 x something, but what is the 'something'?

**Ideas for thinking about Task 2:**

You probably did all the subtractions and then added the differences up, because that is the order in which the instructions were given. So some numbers will have been added and some of them subtracted. If you write these all out without doing the calculation you will probably get something like 9 - 1 + 7 - 3 - 5 + 6 ... and so on When you rearrange all these in decreasing number order you will probably get 10 + 9 + ... and so on with some subtractions. Look at this long string and think about simple ways of finding the answer and you might be able to spot why the answer you get is 5 x 5. Think of it as 'five lots of five' rather than five squared. Now don't stop there. You might be able to extend what you have found for different lengths of numbers, maybe not always starting at 1, and maybe with different step sizes.