Steps to Success

Lockdown	
Date	
Subject/s	**Maths**
Learning Objective 	To use simple formulae

		SA 	TA 
Success Criteria 	I know to complete the functions in the correct order		
	I know letters represent numbers		
	I can write algebraic expressions		
Support	Independent Adult Support ( ) Group Work		

Pre-task

Here is an expression that has come from a function machine: Output = $4a + 3$

- What is the output if the input, a, is 7?
- What is the output if he input is 2.5?
- What is the input if the output is 63?

1.

n	5n
4	
12	
300	
	15
	45

2.

n	n + 13
6	
11	
0	
	13
	29

3.

y	y - 10
26	
132	
	122
	25

4.

n	n + 13
4	
12	
	13
	19

5.

n	3n
3	
9	
15	
1	
	24

6.

p	p + 11
1	
101	
	23
	11
	71

7.

n	n -6
8	
15	
12	
1	
	27

8.

a	$\frac{1}{2}a$
4	
10	
3	
	22

9.

h	h^2
3	
8	
100	
	100
	36

10.

v	2v + 3
2	
5	
	19
	51

1.

n	5n
6	
11	
400	
	45
	650

2.

n	n + 11
6	
11	
0	
	9
	29

3.

y	y - 17
26	
132	
	132
	-5

4.

n	2n + 3
4	
12	
	13
	9

5.

n	3n - 5
3	
9	
15	
1	
	16

6.

p	3p + 11
1	
101	
	23
	11
	71

7.

n	3n -6
8	
5	
2	
1	
	27

Problem Solving and Reasoning

Use it!

Explain it!

These two function machines give the same answer.

Input → × 2 → +8 → Output

Input → ☐ → × 2 → Output

What is missing part of the function?
Can you explain why using base 10?
Using algebraic expressions?

Explain it!

This function machine gives the same output for every input.
For example if the input is 5 then the output is 5 and so on.

Input → × 2 → ☐ → Output

What is the missing part of the function?
What other pairs of functions can you think that will do the same?

Use it!

Complete the table of values for the following function.

$$5 + 2a$$

Input	5	7		
Output			75	30

Answers
+ 4 Because a x 2 + 8 is the same as (a + 4) x 2
÷2 Functions that are the inverse of each other.
15, 19, 35, 12.5

Further Challenge

You need to choose any four consecutive numbers and place them in a row with a bit of a space between them, like this:

4 5 6 7

When you've chosen your consecutive numbers, stick with those same ones for quite a while, exploring 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 +'s and one that includes all −'s.

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

Now 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...