

# YEAR 7 — ALGEBRAIC THINKING...

## Algebraic notation

@whisto\_maths

### What do I need to be able to do?

By the end of this unit you should be able to:

- Be able to use inverse operations and "operation families".
- Be able to substitute into single and two step function machines.
- Find functions from expressions.
- Form sequences from expressions.
- Represent functions graphically.

### Keywords

**Function:** a relationship that instructs how to get from an input to an output.

**Input:** the number/ symbol put into a function.

**Output:** the number/ expression that comes out of a function.

**Operation:** a mathematical process.

**Inverse:** the operation that undoes what was done by the previous operation. (The opposite operation)

**Commutative:** the order of the operations do not matter.

**Substitute:** replace one variable with a number or new variable.

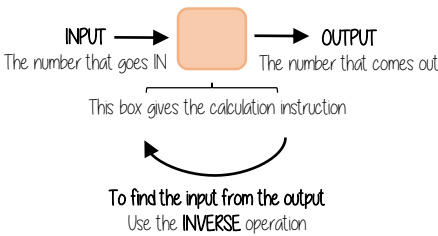
**Expression:** a maths sentence with a minimum of two numbers and at least one math operation (no equals sign)

**Evaluate:** work out.

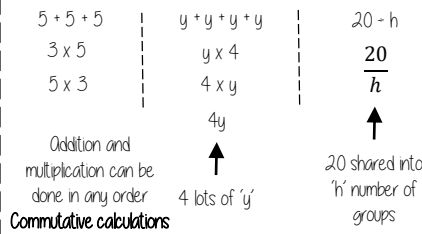
**Linear:** the difference between terms increases or decreases by the same value each time.

**Sequence:** items or numbers put in a pre-decided order.

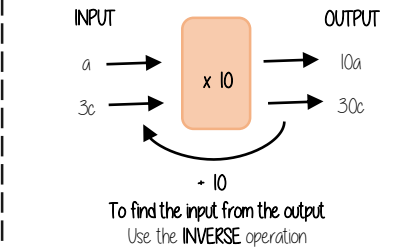
### Single function machines



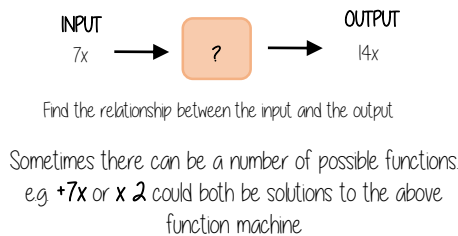
### Using letters to represent numbers



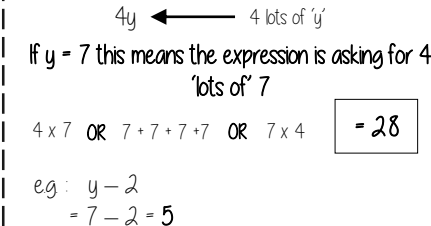
### Single function machines (algebra)



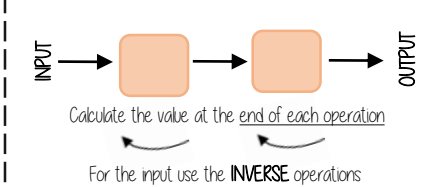
### Find functions from expressions



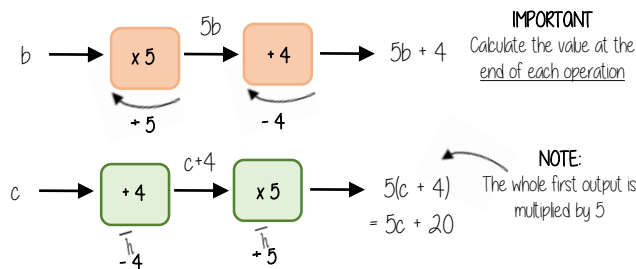
### Substitution into expressions



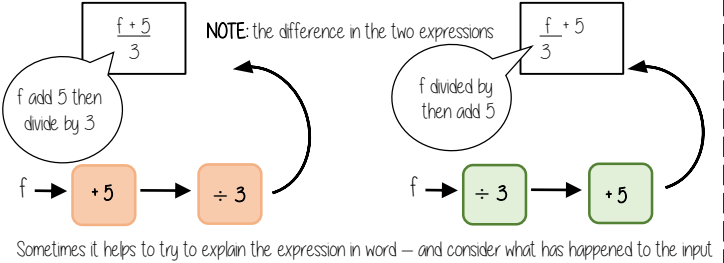
### Two step function machines



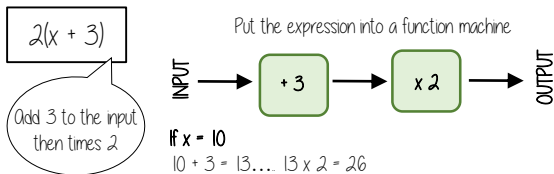
### Two step function machines (algebra)



### Find functions from expressions



### Substitution into an expression



### Representing functions graphically

Take the function and generate a sequence  $2(x+3)$



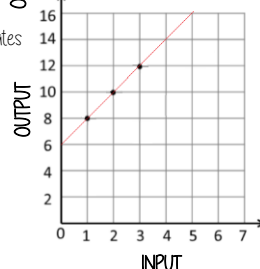
To represent graphically the input becomes x co-ordinates and the output becomes y co-ordinates

$$y = 2(x + 3)$$

INPUT (x)	1	2	3
OUTPUT (y)	8	10	12

This becomes a co-ordinate pair (2, 10) to plot on a graph

Not all graphs will be linear only those with an integer value for x. Powers and fractions generate differently shaped graphs.



NOTE: Because this is a linear graph you can predict other values

### Forming a sequence

INPUT	1	2	3
OUTPUT	8	10	12

The substitution is the 'input' value. The OUTPUT becomes the sequence.