

# YEAR 7 — ALGEBRAIC THINKING...

# Algebraic notation

@whisto\_maths

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

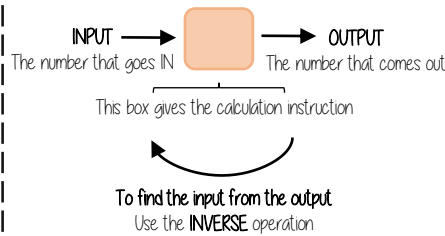
By the end of this unit you should be able to:

- 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.

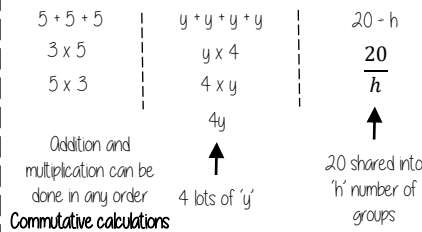
## Keywords

- 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.

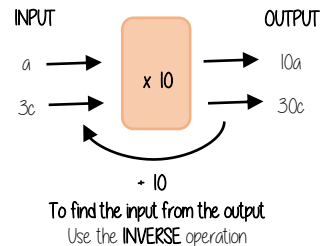
## Single function machines



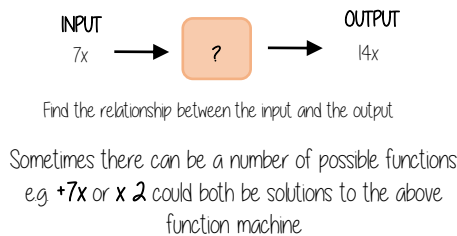
## Using letters to represent numbers



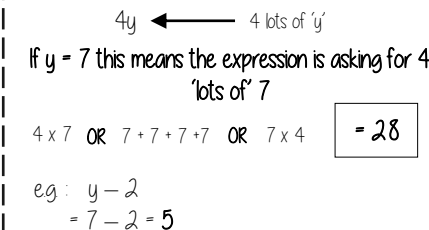
## Single function machines (algebra)



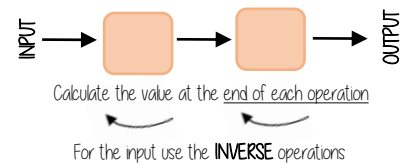
## Find functions from expressions



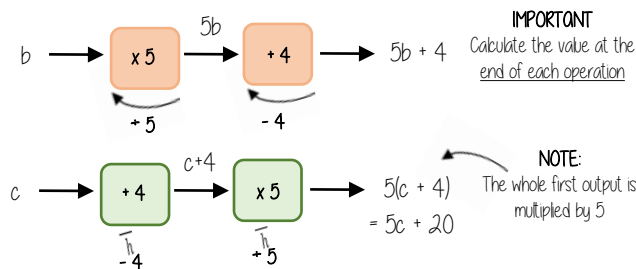
## Substitution into expressions



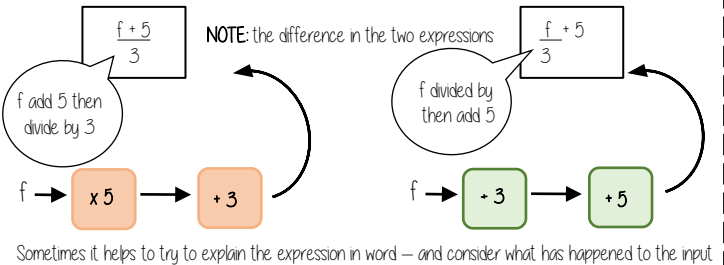
## Two step function machines



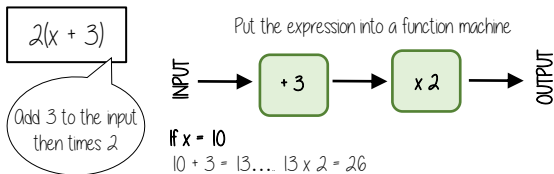
## Two step function machines (algebra)



## Find functions from expressions



## Substitution into an expression



## Representing functions graphically

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



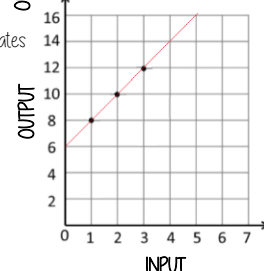
To represent graphically the input becomes x co-ordinates and the output becomes y co-ordinates

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

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.