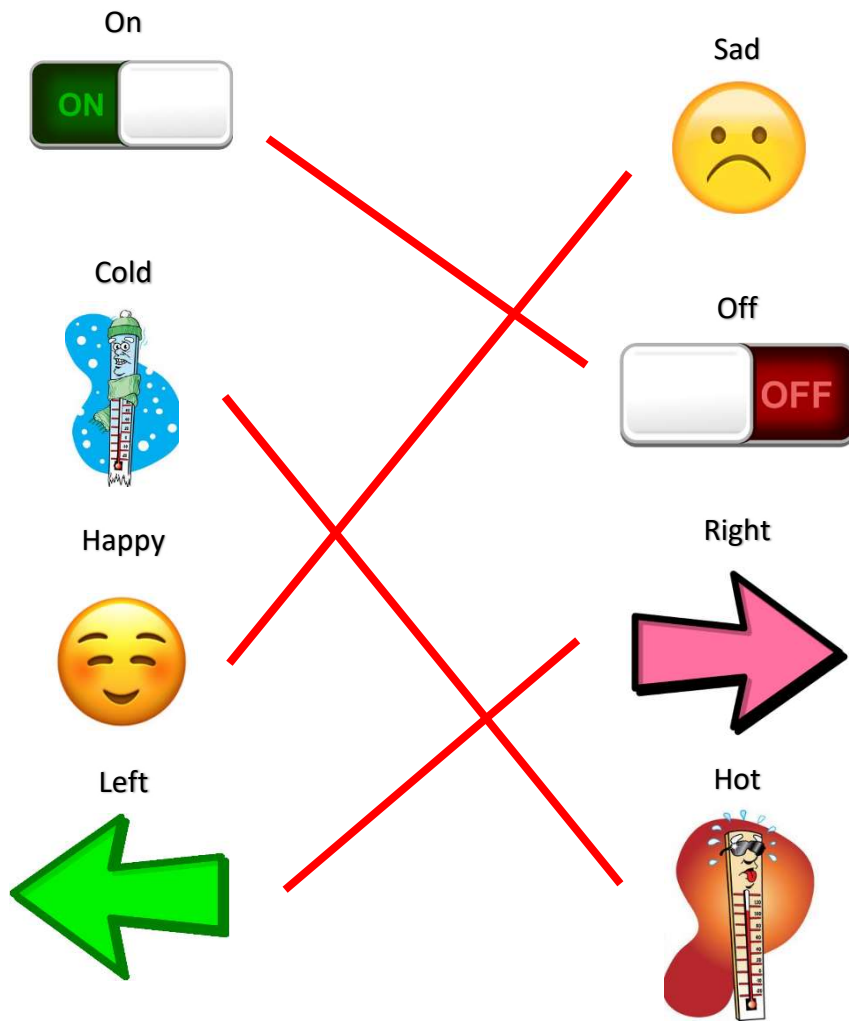


## Function Machines

### Warm up:

To start off with, we will look at opposite pairs, this will help us with a task later on

Task 1: Match up the opposite pairs



#### Literacy for Learning

In English, words with opposite meanings are called antonyms

Extension: How many opposite word pairs of your own can you think of?

**Working with Function Machines:**

A function machine helps us to perform an operation ( +, -, ×, ÷ )

<p>Example: One Step</p> $3 \Rightarrow +5 \Rightarrow 8$ <p>INPUT                      OUTPUT</p> $12 \Rightarrow \div 2 \Rightarrow 6$ <p>INPUT                      OUTPUT</p>	<p>Example: Two step</p> $5 \Rightarrow -1 \Rightarrow 4 \Rightarrow \times 3 \Rightarrow 12$ <p>INPUT                                           OUTPUT</p> $40 \Rightarrow \div 5 \Rightarrow 8 \Rightarrow +2 \Rightarrow 10$ <p>INPUT                                           OUTPUT</p>
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Task 2: Find the outputs of these function machines

$2 \Rightarrow +3 \Rightarrow 5$	$17 \Rightarrow -9 \Rightarrow 8$
$10 \Rightarrow -7 \Rightarrow 3$	$12 \Rightarrow \times 12 \Rightarrow 144$
$8 \Rightarrow \times 5 \Rightarrow 40$	$23 \Rightarrow +8 \Rightarrow 31$
$28 \Rightarrow \div 4 \Rightarrow 7$	$78 \Rightarrow \div 6 \Rightarrow 13$

Extension: Find the outputs of these function machines

$3 \Rightarrow \times 2 \Rightarrow +5 \Rightarrow 11$
$30 \Rightarrow \div 6 \Rightarrow -3 \Rightarrow 2$
$9 \Rightarrow +7 \Rightarrow \div 4 \Rightarrow 4$
$x \Rightarrow \times 3 \Rightarrow +1 \Rightarrow 3x + 1$
$y \Rightarrow -5 \Rightarrow \div 2 \Rightarrow \frac{y-5}{2}$

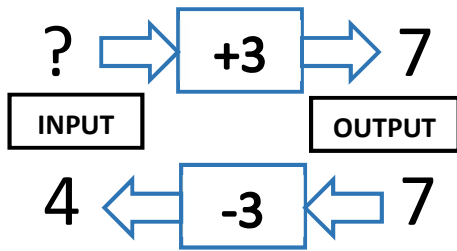
**Working with Inverses:**

We can use inverse functions to go from our output back to our input!

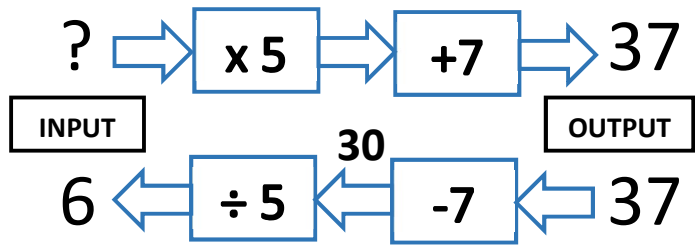
+ is the inverse to –

× is the inverse to ÷

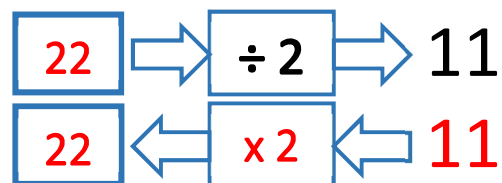
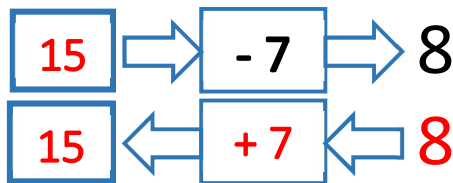
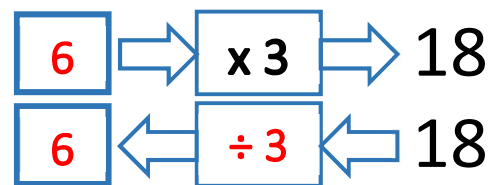
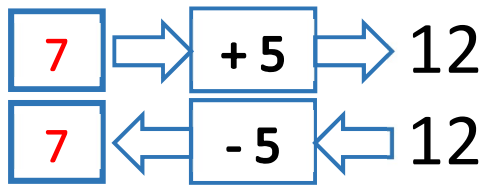
Example: One Step



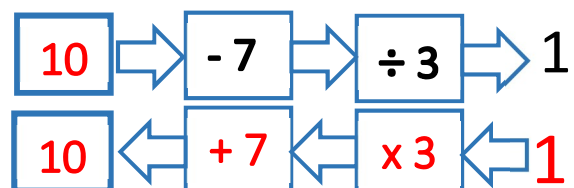
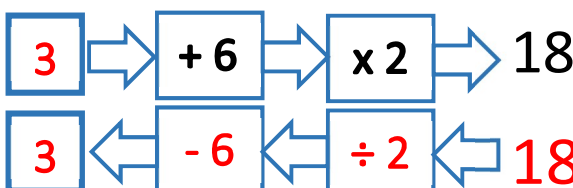
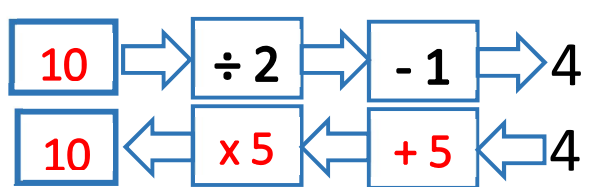
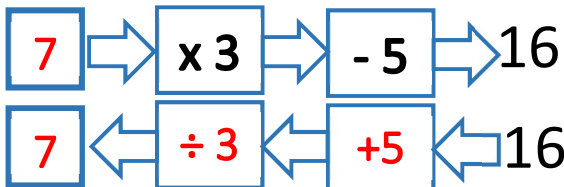
Example: Two step



Task 3: Find the inputs of these function machines



Extension: Can you write expressions for the outputs of these functions?



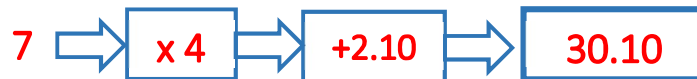
**Problem Solving**

Use what we have learnt on function machines to help you to solve problems!

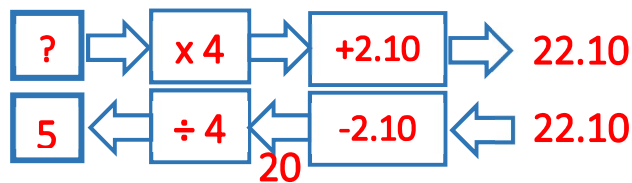
**Question 1**

The cost of a taxi journey is calculated by multiplying the number of kilometres travelled by £4 and then adding on £2.10.

- a) I take a taxi for 7km, how much will the journey cost me? **£30.10**



- b) The cost of a different journey is £22.10, how far did I travel? **5km**



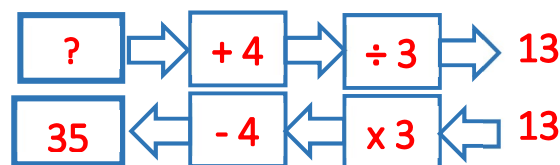
**Question 2**

I am thinking of a number. I add 4 to my number and then divide it by three.

- a) If the number I am thinking of is 20, what number do I end up with? **8**



- b) If the number I end up with is 13, what number did I start with? **35**



**Extension:**

Bella is 3 years younger than Malachi.

Femi is twice as old as Bella.

If Femi is 10,

- a) How old is Bella? **5**  
b) How old is Malachi? **8**

