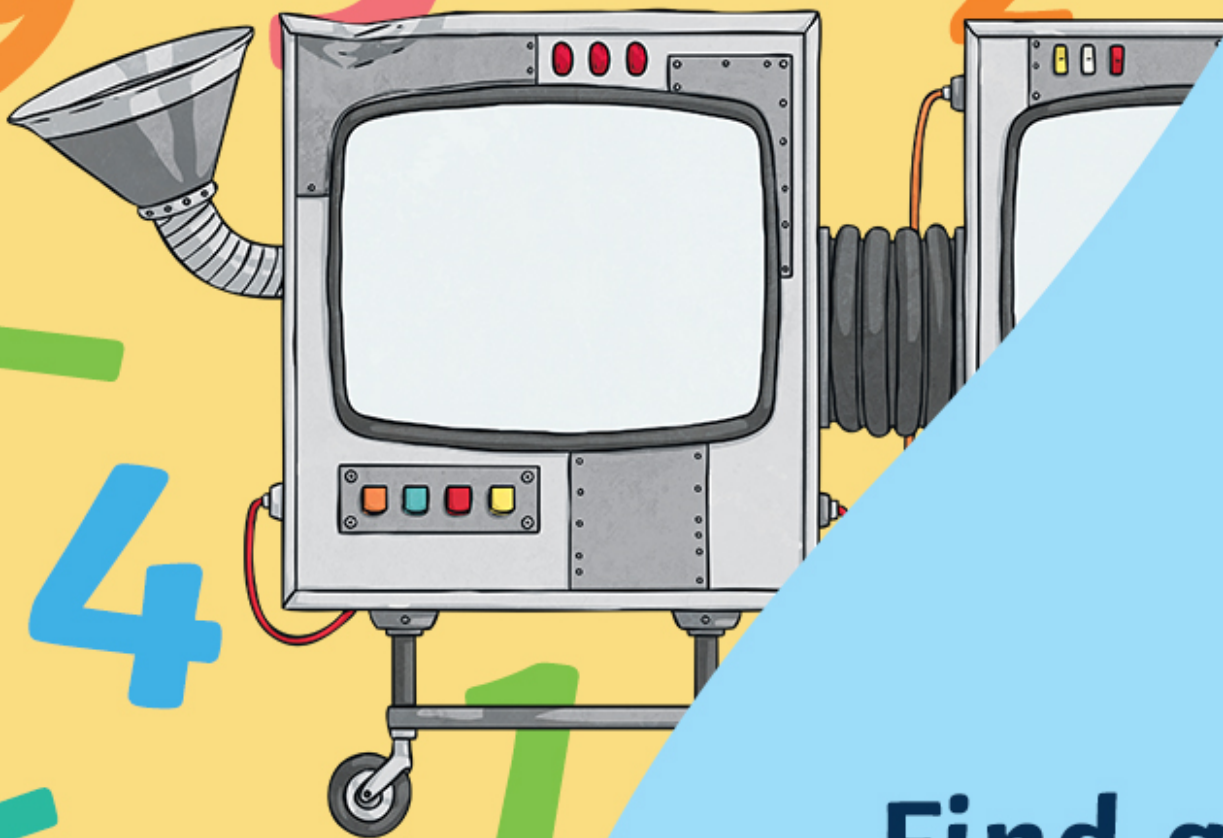


Diving into Mastery



Find a Rule - Two Step

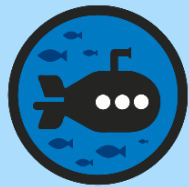


Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:



Diving



Deeper



Deepest

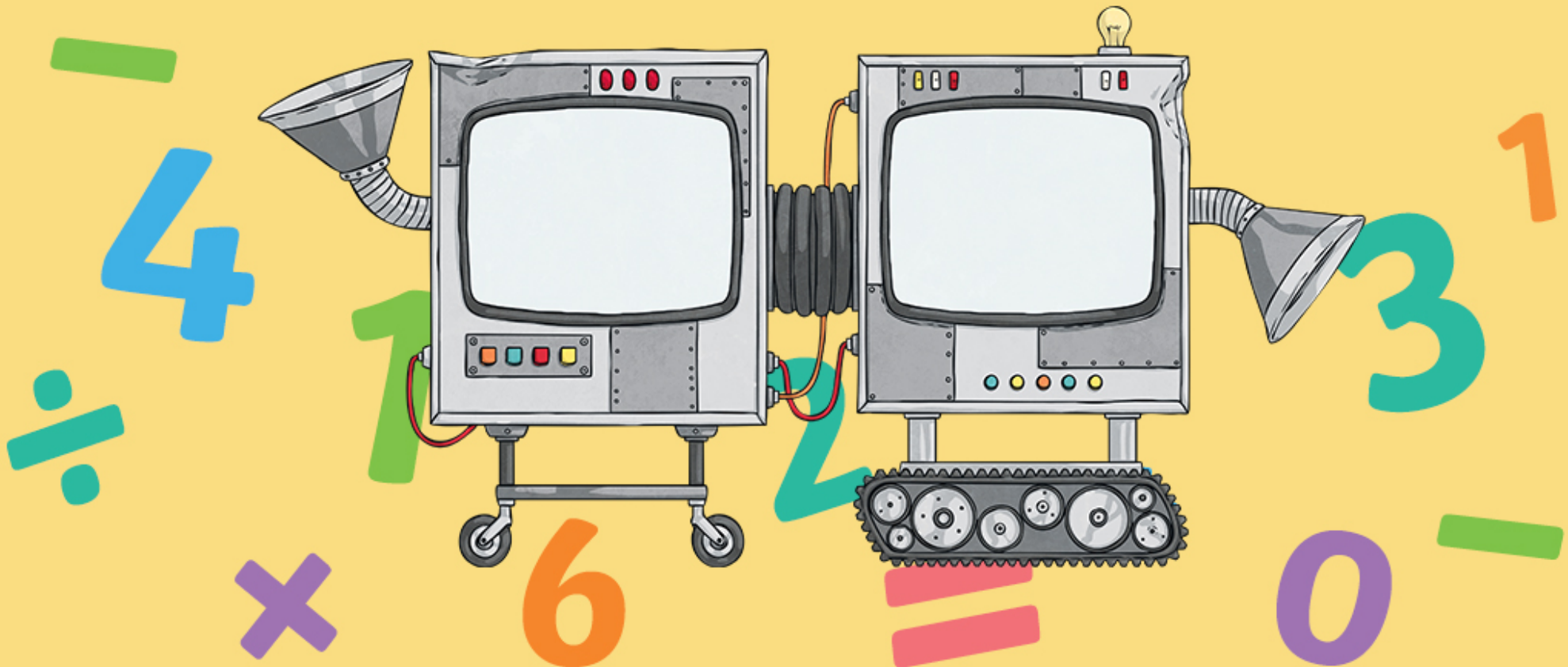
These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

Aim

- Use simple formulae.

- # Aim
- Use simple formulae.

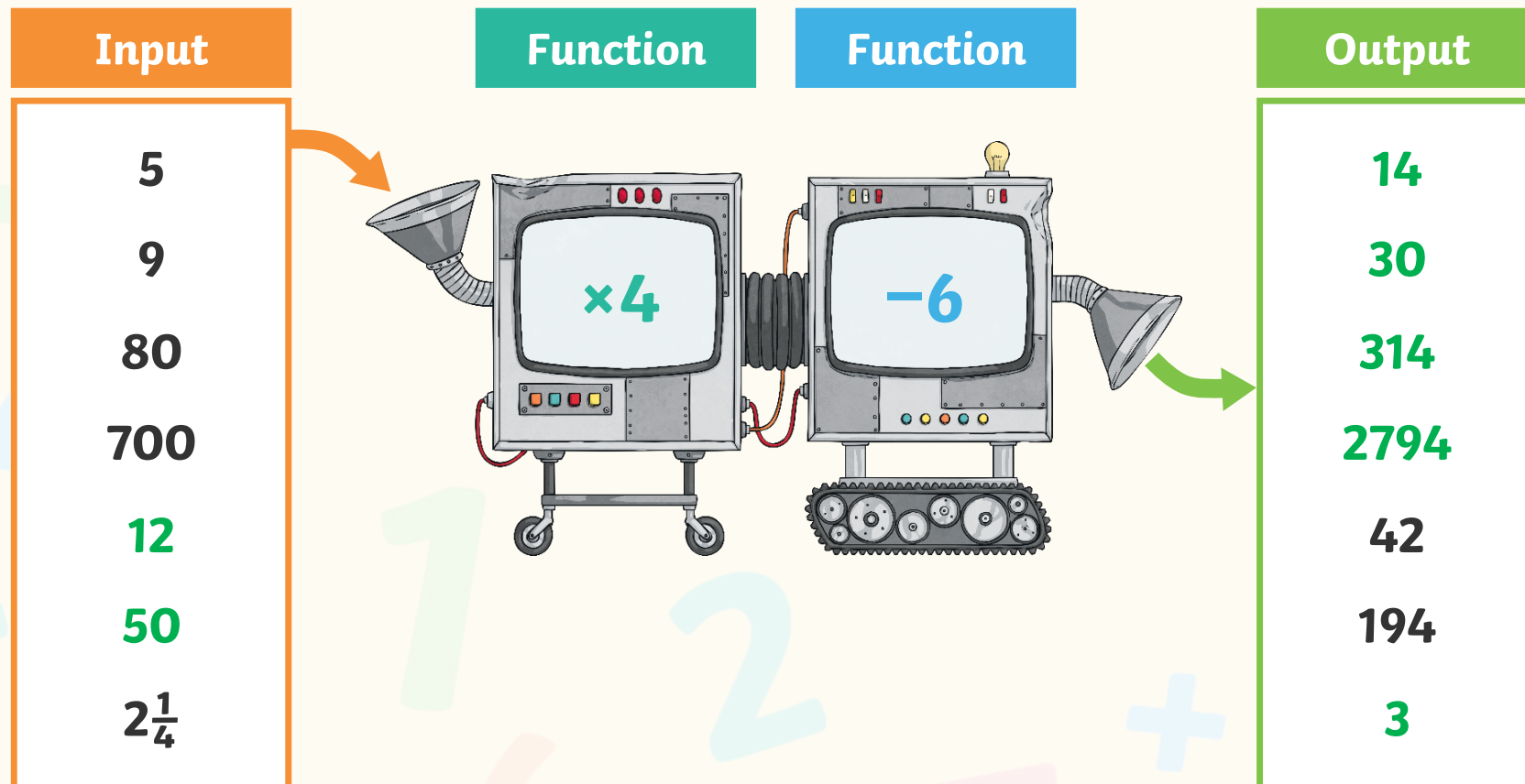


Find a Rule – Two Step

Diving



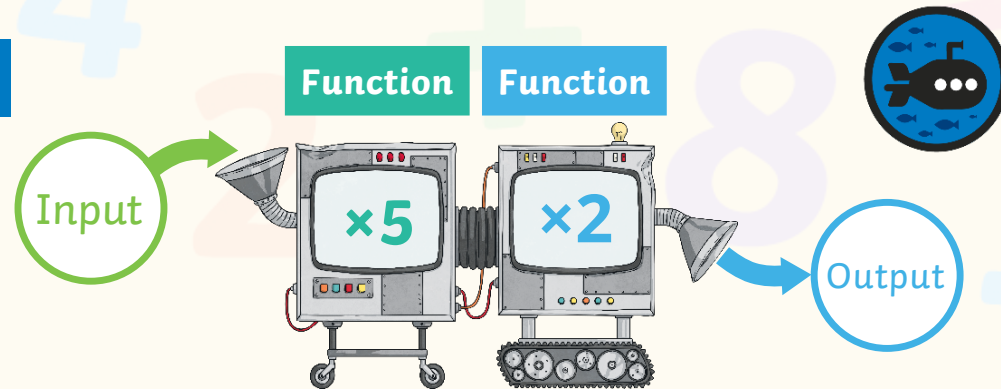
This function machine has two steps.
Give the missing inputs and outputs for the machine.



Find a Rule – Two Step

Deeper

Emily and Jamal are thinking how they could change this two-step function machine into a one step-function machine.



Do you agree or disagree with each child's statement? Explain why.



Emily: I think that this function machine could be changed to a one-step machine if we add the $\times 5$ and $\times 2$ together to make one function of $\times 7$. The output would still be the same.

Emily is incorrect, as when we multiply a number by 5, then multiply it by 2, this is not the same as multiplying by 7. For example, if the input was two, then $2 \times 5 \times 2 = 20$, whereas $2 \times 7 = 14$.



Jamal: I think that this function machine could be changed to a one-step machine by having the function of $\times 10$. It would then give the same answer as the two-step function machine.

Jamal is correct, as when we multiply a number by 5, then multiply it by 2, this is the same as when we multiply by 10. For example, if the input was five, then $5 \times 5 \times 2 = 50$ and $5 \times 10 = 50$.

Find a Rule – Two Step

Deepest



Give an input number, two functions and an output that follow the rules set by the function machine.

Input

Any whole number up to 100

Function

\times any multiple of 4

Function

$-$ any multiple of 6

Output

Make each number in three different ways.

6
18
30

For example:

$$3 \times 4 - 6 = 6$$

$$3 \times 12 - 30 = 6$$

$$3 \times 18 - 48 = 6$$

$$3 \times 12 - 18 = 18$$

$$18 \times 4 - 54 = 18$$

$$6 \times 12 - 54 = 18$$

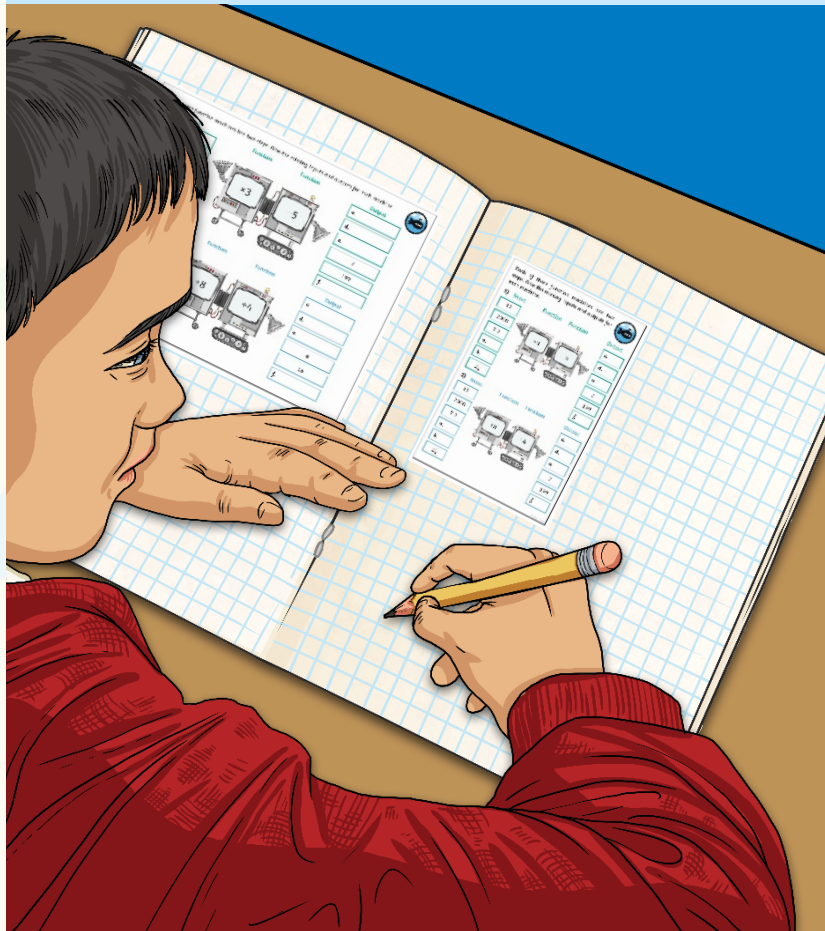
$$9 \times 4 - 6 = 30$$

$$18 \times 4 - 42 = 30$$

$$6 \times 12 - 42 = 30$$

Find a Rule – Two Step

Dive in by completing your own activity!



1) Is each child's statement about the function machine correct? Write 'Yes' or 'No'.

Ole

Thomas

Logia

2) Look at these two-step function machines. Do you agree or disagree with the statement? Write 'Yes' or 'No'.

If I add the function $+7$ into both function machines, then both machines will give the same answer.

Each of these function machines has two steps. Give the missing inputs and outputs for each machine.

1)

Input	Function	Function	Output
12	$\times 3$	-5	a.
2000			d.
7.2			e.
a.			7
b.			199
$2\frac{1}{2}$			f.

2)

Input	Function	Function	Output
20	$+8$	$\div 4$	a.
72			d.
132			e.
a.			6
b.			16
0.8			f.

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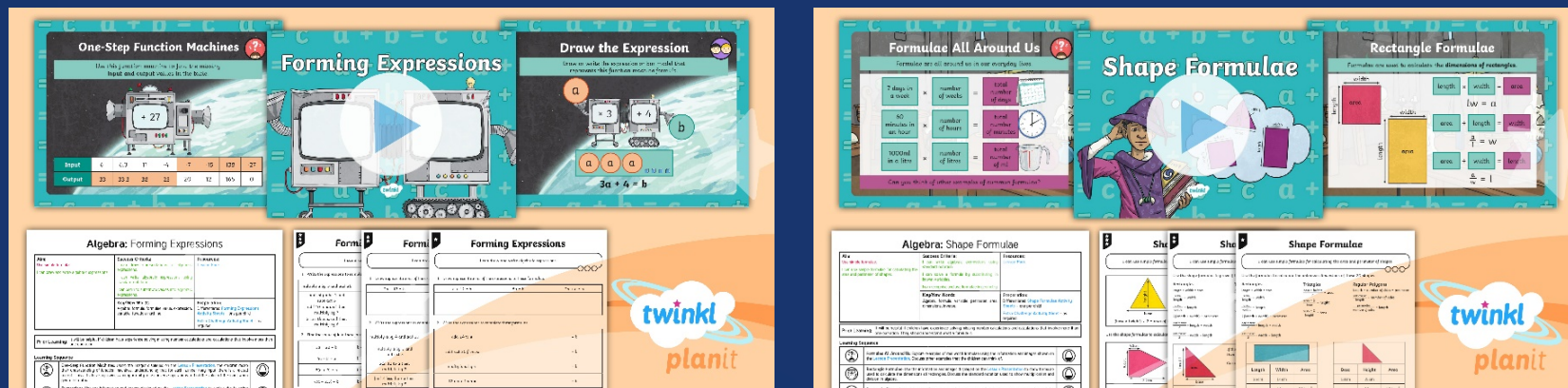
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