

Input and output: number rules shown as a table

MODULE 10 · ALGEBRA — PATTERNS, RULES AND NUMBER SENTENCES

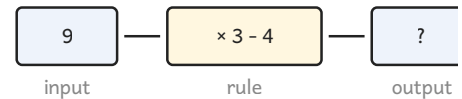
ALGEBRA

HOW TO ANSWER TODAY

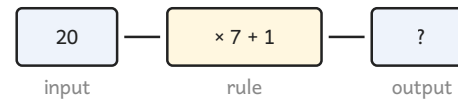
- **Function machine.** Do EACH step of the rule in order to the input.
Rule $\times 4 + 2$, input $5 \rightarrow 5 \times 4 = 20, + 2 = 22$
- **Find the rule.** Look at how each input changes to its output. Try $\times$ first, then $+$ or $-$.
 $3 \rightarrow 6, 5 \rightarrow 10, 7 \rightarrow 14 \rightarrow$ rule is $\times 2$

STRETCH PROBLEMS

- 1 Cara sets up a treat machine for her sleepover. It takes the number of guests, multiplies it by 3 and then takes away 4 to work out how many biscuits to lay out. If 9 friends come, how many biscuits does the machine say to lay out?



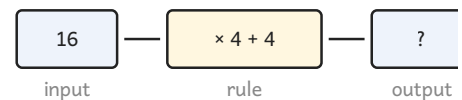
- 2 Cian is planting seeds in the school polytunnel. He fills each tray with 7 seeds and then plants 1 extra seed in a spare pot at the end. If he uses 20 trays, how many seeds does he plant in total?



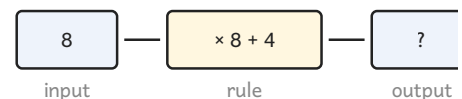
- 3 Cian is running a scoring machine for the lunchtime soccer game in the yard. When he types in 7 it shows 23, when he types in 5 it shows 17, and when he types in 10 it shows 32. What rule is the machine using to turn each input number into its output?



- 4 At the class games night, a points machine takes a score, multiplies it by 4, then adds 4. If the machine takes an input of 16, what output does it give?



- 5 Master Ó Ceallaigh's function machine follows the rule: multiply by 8, then add 4. Cian feeds the number 8 into the machine. What number comes out?



INVESTIGATE

Invent a secret rule

Make up a number rule and build an input-output table for at least six inputs. Challenge a partner to find your rule from the table alone. Can you design a rule so tricky they need an extra clue?
