Input and output — number rules shown as a table

MODULE 10 · ALGEBRA — PATTERNS, RULES AND NUMBER SENTENCES ALGEBRA

HOW TO ANSWER TODAY

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

STRETCH PROBLEMS

1. At the Cumann na mBunscol blitz, a scorekeeper notices a pattern between each team's tries and their final total. One team scored **4** tries for **12** points, another scored **7** tries for **18** points, and a third scored **6** tries for **16** points. What is the rule that turns the number of tries into the total points?

input	rule	output
4	?	12

2. At the club hurling pitch, a scoreboard machine turns the number of goals into a total score. When Tadhg puts in **10** it shows **66**, when he puts in **2** it shows **18**, and when he puts in **1** it shows **12**. What is the rule that maps each input to its output?

input	rule	output
10	?	66

3. At Camogie training, Aoife uses a scoring machine with the rule multiply by **7**, then subtract **4**. She feeds in the number **19**. What number comes out?

input	rule	output
19	× 7 − 4	?

4. Múinteoir has a points machine for lining up quietly before the yard. When **8** pupils line up she gives **32** stars, when **3** pupils line up she gives **17** stars, and when **7** pupils line up she gives **29** stars. What rule turns the number of pupils into the number of stars?

input	rule	output
8	?	32

5. At granny's house on Sunday, Oisín sets up a number machine for his cousins. When he puts in **2**, out comes **14**. When he puts in **10**, out comes **54**. When he puts in **7**, out comes **39**. What is the rule that changes each input into its output?

input	rule	output
2	?	14

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?