

Patterns and rules investigation

MODULE 10 · ALGEBRA — PATTERNS, RULES AND NUMBER SENTENCES

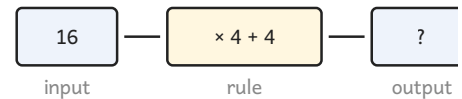
ALGEBRA

HOW TO ANSWER TODAY

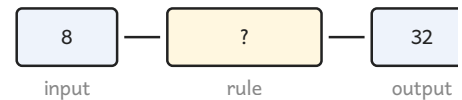
- **Function machine.** Do EACH step of the rule in order to the input.
Rule $\times 4 + 2$, input $5 \rightarrow 5 \times 4 = 20, + 2 = 22$
- **Find the rule.** Look at how each input changes to its output. Try $\times$ first, then $+$ or $-$.
 $3 \rightarrow 6, 5 \rightarrow 10, 7 \rightarrow 14 \rightarrow$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

★ STRETCH PROBLEMS

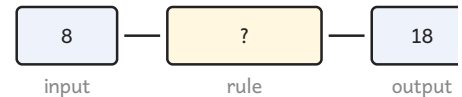
- 1 Mr Ó Briain draws a function machine on the whiteboard with the rule $\times 4 + 4$. Cian puts the number 16 into the machine. What number comes out?



- 2 Mr Ó Briain pins a number-rule chart on the 4th class noticeboard with three input-output pairs: $8 \rightarrow 32$, $3 \rightarrow 17$, and $7 \rightarrow 29$. What is the rule that turns each input into its output?



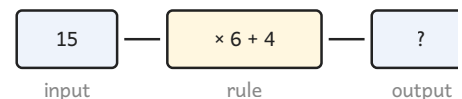
- 3 Sean and his friends play a soccer match in the schoolyard at lunchtime. Each team starts with 10 bonus points before the match begins, then adds the goals they score. The scoreboard shows: 8 goals $\rightarrow$ 18 points, 3 goals $\rightarrow$ 13 points, 7 goals $\rightarrow$ 17 points. What is the rule that turns the number of goals into the team's points?



- 4 Tadhg's mam adds the same number of grapes to his lunchbox each day, on top of whatever crackers he packs. On Monday he packs 6 crackers and ends up with 17 items; on Tuesday he packs 8 crackers and has 19 items; on Wednesday he packs 1 cracker and has 12 items. What is the rule that takes the number of crackers to the total number of items?



- 5 Tadhg's class has a function machine rule for working out birdseed servings at the classroom feeder: multiply the number of days by 6, then add 4 to get the total spoonfuls needed. If the feeder runs for 15 days, how many spoonfuls of birdseed are needed in total?



● INVESTIGATE

Seats around the tables

One square table seats 4 people. Two tables pushed in a row seat 6. Draw the next few arrangements and record the seats each time. How many seats for 5 tables? Find a rule for any number of tables and test it on 8 tables.
