

Algebra investigation – patterns and rules

MODULE 10 · ALGEBRA — PATTERNS, RULES AND NUMBER SENTENCES

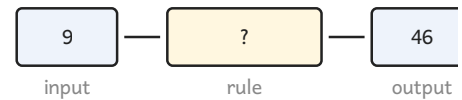
ALGEBRA

HOW TO ANSWER TODAY

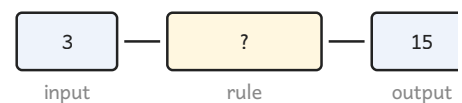
- **Find the rule.** Look at how each input changes to its output. Try $\times$ first, then $+$ or $-$.
 $3 \rightarrow 6$, $5 \rightarrow 10$, $7 \rightarrow 14 \rightarrow$ rule is $\times 2$
- **Function machine.** Do EACH step of the rule in order to the input.

★ STRETCH PROBLEMS

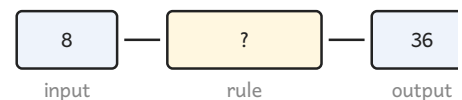
- 1 Cara runs a raffle stall at the school fair, where each ticket costs the same and there is a small booking fee added on. When **9** tickets are sold, the total is **46**. When **10** tickets are sold, the total is **51**, and **8** tickets give a total of **41**. Find the rule that maps each number of tickets to its total.



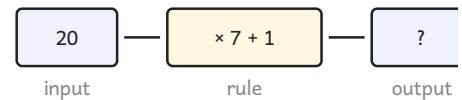
- 2 At the school sports day, the teacher gives out points for each lap run in the relay race. When a team runs **3** laps they get **15** points, **9** laps gives **33** points, and **10** laps gives **36** points. What is the rule that turns the number of laps into the number of points?



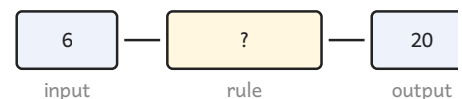
- 3 Aoife runs a stall at the school fair where every child pays a fee for a bag of prizes. She notes that **8** children brought in **36 euro**, **10** children brought in **44 euro**, and **1** child brought in **8 euro**. What is the rule that turns the number of children into the money collected?



- 4 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?



- 5 Cian is working out the rule for a number machine in maths. When he puts in **6** it gives **20**, when he puts in **4** it gives **14**, and when he puts in **1** it gives **5**. What is the rule that turns each input into its output?



● INVESTIGATE

How does your pattern grow?

Build a growing pattern with sticks, cubes or drawings (for example a row of squares or triangles). Record how many pieces you need for steps 1, 2, 3 and 4. Find the **rule**, then predict step 10 and step 20 without building them.
