

## Generalising number patterns and sequences

### WHAT THIS LESSON TEACHES

A number pattern has a hidden rule that turns each position number into the next term, often a multiply step then add or subtract.

→ In 4, 7, 10, 13 the rule is position times 3 then add 1.

→ For 6, 11, 16, 21 the rule is position times 5 then add 1.

### MODEL THIS ON THE BOARD

#### FIND THE RULE FOR 4, 7, 10, 13

- ① Look at the first term: position 1 gives 4.
- ② Try multiply by 3 then add 1: 1 times 3 is 3, plus 1 is 4.
- ③ Check next: 2 times 3 is 6, plus 1 is 7.
- ④ The rule works for every term.

### ANSWER KEY

Q1: 16

Q2: 31

Q3: add 3; 26

Q4: add 10; 97

Q5:  $n(n+2)$ ; 63

a) Always — A constant step means the rule is the same for every position.

b) Always — The rule position times 3 plus 1 gives the exact term no matter how far.

c) Never — This pattern has changing steps so no single multiply-and-add rule fits all.

d) Sometimes — It works if the rule is found first, but not if the steps keep changing.

### EXTENSION SHEET · STRETCH ANSWERS

S1: 14

S2: 2

S3: -6

S4:  $\times 6 + 4$

S5:  $\times 3 + 8$

**Investigation:** Growing patterns — open-ended; scan pupils' working for valid solution paths rather than a single answer.