

## Missing numbers: the rule finds them

### CURRICULUM ALIGNMENT

**ALG.PRR.2** identify and express relationships in patterns, including growing or shrinking shape patterns and number sequences.

**INTERACTIVES** Number Line Jumps · challenge, display, explore

### WHAT THIS LESSON TEACHES

Equal jumps of 2, 5 or 10 make a counting pattern. Name the jump size, make the same jump each time, and land on the missing number in the gap.

→ In 2, 4, 6, 8 the rule is jumps of 2.

→ In 2, 4, \_\_, 8 the missing number is 6 because each jump is +2.

### MODEL THIS ON THE BOARD

#### THE BLOWN-AWAY GAME CARD

- 1 The cards on the string show 2, 4, \_\_, 8.
- 2 From 2 to 4 the jump is **+2** so the rule is jumps of 2.
- 3 Start at 4 and jump **+2** to land on **6**.
- 4 Check the next jump:  $6 + 2$  lands on 8, so 6 fills the gap.

### LESSON ARC

Open with cards on a string — 2, 4, blank, 8 — and five seconds of quiet think-time. Hold out for the jump of two, not a bare guess of six. Work three snapshots on the number-line interactive: name the jump size before arcs draw, then land on the gap. Pupils take board turns on four Try It Together patterns and chant each finished line. Brief copybook of two skip-count lines, then Class Challenge. Student Activity Book follows What's Next.

### TEACHING MOVES

1. **Getting Started.** Hold the string of cards in view — 2, 4, blank, 8. Give five full seconds of silent think-time before any hands. Take three answers, then stop bare guesses of six and ask how do you know? Hold out until someone names the jump of two.
2. **Watch and Notice.** Work each number-line snapshot live. Freeze before the arcs appear and ask what is the jump size? — hands-up only. Name the landing aloud before the arc draws (from 10 a jump of five lands on 15). Revoice pure guesses as the jumps prove it — we did not just hope.
3. **Try It Together.** Pupils take turns at the board; the class agrees or corrects out loud. Freeze before every plot and demand the jump size first. On 10, \_\_, 30, 40 start at 10 and jump forward +10 — steer away from reversing from 30. Chant each finished line together to check equal climbs.
4. **Write the skip-count lines.** Pupils write the two finished lines in their maths copy, one under the other. Walk the row glancing at spacing and commas only — whole-class copybook practice, not marking.
5. **Class Challenge.** Keep board turns brisk: jump size, plot, check, next. On 20, \_\_, 40, 50 watch for pupils starting at 40 — the start is 20. On 25, 30, \_\_, 40 pause for a class prediction of 35 before Check.

6. **What Did We Notice?** Ask how the jump of 2 told us the missing number was 6. Follow up: would a different number fit that jump? Revoice: once the jumps stay the same, the gap has only one number that fits. Head off guessing with how would you prove it on the line?

### COMMON MISCONCEPTIONS

⚠ Pupils shout six for 2, 4, \_\_, 8 from memory and never name the jump — a guess, not a proof.

Stop and ask how do you know? Insist on the jump size. On the number-line interactive start at 4, draw one +2 arc, and land on 6 so the class sees the landing prove the gap.

⚠ When the gap sits right after the start — 10, \_\_, 30, 40 — pupils reverse from 30 to invent 20 instead of jumping forward.

Freeze the board. Point at the leftmost known number: we start here and jump forward. Reset and plot a single +10 from 10 only.

⚠ On 20, \_\_, 40, 50 pupils begin at 40, or leap +20 straight from 20 to 40 and skip the equal-step rule.

Call the jump size from the known pair first (40 to 50 is +10). Then start at 20 and make one +10 jump so the landing is 30.

### DIFFERENTIATION

#### EMERGING

- Stay on jumps of 2 for the first board turns; you name the jump size and the pupil only plots the landing arc.
- Pre-say the jump size before each Class Challenge item so the pupil at the board only has to land on the gap.

#### DEVELOPING

- After a correct landing, have them chant the full line and check every step still matches the jump size.
- On 25, 30, \_\_, 40 ask them to name 35 before Check, then say which known number they started from and why.

#### PROFICIENT

- After a landing, cover one end number on the IWB and ask: if that end were blank too, how would the same jump still fix both gaps? Then send them ahead into the Student Activity Book page.

✦ **Cross-curricular:** Tie to money sense — count 10c coins in a line (10, 20, \_\_, 40) and use the jump of 10c to name the missing amount.

### ANSWER KEY

a) 24

b) 35

c) 30

Q1: 14

Q2: 45

Q3: 60

Q4: 20

Q5: 31

a) **Always** : Equal jumps of 2 mean every step adds exactly 2.

b) **Never** : Each step adds 10, so the jump size is 10.

c) **Always** : That is the lesson rule for finding the gap.

d) **Never** : Jumps of 2 give 6, not 5.

### EXTENSION SHEET · STRETCH ANSWERS

S1: 25

S2: 44

S3: 46