Lesson 84 MIXED

Plotting and reading points with negative co-ordinates

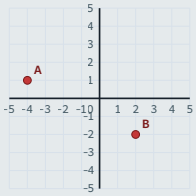
CURRICULUM ALIGNMENT

SHA.SAL.4a describe location on the full co-ordinate plane.

INTERACTIVES Coordinate Grid · challenge, display, explore

WHAT THIS LESSON TEACHES

Reading and plotting in all four quadrants follows the same rule — **(x, y)**: how far across (left if negative), then up or down.



→ (−4, −1): 4 left, 1 down.

LESSON ARC

Open with (−5, −2) on the IWB and ask which way each minus sends you — left, then down. Walk three plotted examples on the coordinate-grid interactive, pointing at each minus and saying 'minus means the other way'. Pupils rule a four-quadrant grid (−6 to 6) in their copy and plot three points, then read three you place on the board. The Student Activity Book follows for solo practice.

TEACHING MOVES

1. **Getting Started.** Put (−5, −2) up and take two or three hands-up answers, not call-outs. Listen for whether pupils link the minus to direction (left/down) or wrongly to 'a smaller number' — that tells you who needs the slow walk-through next.
2. **Watch and Notice.** Plot each pair one at a time on the coordinate-grid interactive, tapping the minus sign as you say 'go the other way'. On the read-back point, make the class look across first (four right), then down (two down), and agree (4, −2) aloud before the on-screen label confirms it.
3. **Try It Together.** Rotate four pupils at the board, alternating read and plot — hide a label and have the class read it, then call a pair to plot. Watch for the swap error: a pupil reading (4, −2) as (−2, 4) has gone up-before-across. Revoice 'always across first, then up or down'.
4. **Plot and Read in Your Copy.** While pupils rule their −6 to 6 grid and plot the three points, walk the room glancing for across-before-up and minus signs landing in the right direction. No marking. Once most have the three plotted, place three fresh points on the board for them to read and record.
5. **Class Challenge.** Brisk board work — pupils take turns, the class predicts each answer before Check is tapped, confirm, move on. Don't re-explain each plot. For the complete-the-rectangle problem, let pupils reason aloud about which corner is missing rather than feeding them the pair.
6. **What Did We Notice?.** Pose (−3, 4) versus (4, −3) and listen for pupils naming order as the thing that changes everything. Revoice a strong answer: 'three left and four up is top-left; four right and three down is bottom-right — opposite corners.' Head off 'same because the numbers are the same'.

COMMON MISCONCEPTIONS

⚠ A pupil reads a placed point up-before-across — a dot four right and two down comes out as (−2, 4) instead of (4, −2).

Stop and revoice 'across first, then up or down' while tracing the path on the coordinate-grid interactive with your finger: along the x-axis to four, then drop down to the dot. Have the pupil read it again following your trace.

⚠ Pupils insist (−3, 4) and (4, −3) land in the same place 'because they're the same numbers and the same minus'.

Plot both on the interactive side by side so the class sees one in the top-left and one in the bottom-right. Same digits, opposite corners — the order and which number carries the minus decide everything.

⚠ A pupil treats the minus as making the number smaller rather than as a direction — they plot (−5, 2) somewhere near the origin instead of five squares left.

Point at the minus and say 'this isn't a smaller five, it's a five going the other way'. Count the five squares left aloud with the class as you drag the point on the interactive.

DIFFERENTIATION

EMERGING

- Stay with one negative at a time on the IWB (like (−5, 2)) while the class moves to both-negative pairs; the pupil mirrors those simpler points in copy.
- Have them rule the grid axes lightly in pencil and number them 0 to ±6 before any plotting, so the structure is set before they place a single dot.

DEVELOPING

- After the copybook points, give a pair like (−4, 0) or (0, −5) and ask where a point sits when one co-ordinate is zero — on an axis, not in a quadrant.
- Ask them to predict the quadrant from the signs alone before plotting: which corner does (−, −) always land in?

PROFICIENT

- Narrate a harder variant of the rectangle challenge from the front: give two diagonal corners and ask them to find both missing corners and explain how they know.
- Pull them ahead into the Student Activity Book page while the class finishes the board work.

Cross-curricular: Tie to Geography — read grid references on an Irish OS map, comparing how its eastings-then-northings rule matches 'across first, then up'.

ANSWER KEY

W1: 3 units

W2: (1, 4) → Q1

W3: 1.2 m

W4: 90 cm

Q1: 4 units

Q2: (-6, 4) → Q2

Q3: 6 units

Q4: (8, -4) → Q4

EXTENSION SHEET · STRETCH ANSWERS

S1: (-6, 9) → Q2

S2: 3 units

S3: (-6, 4) → Q2

S4: 9 units

S5: (-6, 9) → Q2