

All four quadrants: first walk

CURRICULUM ALIGNMENT

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

INTERACTIVES Coordinate Grid · challenge, display, explore

WHAT THIS LESSON TEACHES

The axes cross at zero and keep going, so points can sit left or down as well as right or up. A minus on x sends the point left of the y-axis; a minus on y sends it below the x-axis, and the four regions are the four quadrants.

→ $(-3, 4)$ is three steps left and four steps up.

→ $(-2, -5)$ sits in the third quadrant (left and down).

MODEL THIS ON THE BOARD

PLOT $(-3, 4)$ ON THE GRID

- 1 Start at the origin where the axes cross.
- 2 The x-value is -3 , so move **three** steps left of the y-axis.
- 3 The y-value is 4 , so move **four** steps up from there.
- 4 Mark and label the point; it lands in the second quadrant.

LESSON ARC

Open with the four-quadrant grid on the board and take quiet guesses for $(-3, 4)$. In Watch and Notice, point at each minus as its dot lands — left for the first number, down for the second — and number the corners anticlockwise from top-right. Pupils plot four spread points at the board, then sketch a -5 to $+5$ grid in their copy and label each point's quadrant. The Class Challenge is the practice round.

TEACHING MOVES

1. **Getting Started.** Show the four-quadrant grid as pupils settle and give five seconds of silent think-time before hands. Take two or three guesses for $(-3, 4)$ — no call-outs — and deliberately don't confirm; the next step builds the answer.
2. **Watch and Notice.** As each dot lands, physically point at the minus sign and name the push: 'left' for the first number, 'down' for the second. Land $(0, -3)$ on the axis itself and say plainly it sits on the line, in no quadrant — head this off before it becomes a misconception.
3. **Try It Together.** Run the four points in order so one lands in each quadrant. Before each reveal, ask a pupil to predict the quadrant number, then revoice a good answer: 'so both minus means left AND down — that's quadrant three.'
4. **Sketch the Grid in Your Copy.** Walk the room glancing at two things only: axes labelled and zero at the centre. No marking. The slip to catch is reversed x and y, which drops a point into the wrong quadrant number.
5. **Class Challenge.** Keep board work brisk — pupils predict the quadrant, plot, and the class confirms before moving on. Don't re-explain each point; this is consolidation. Watch the both-minus points, where the reversed-order slip most often shows.

6. What Did We Notice?. Push pupils to separate the two jobs the minus signs do rather than accept 'both are negative'. Revoice: 'the minus on the first number sends it left, the minus on the second sends it down — so swapping which number carries the minus flips a different direction.'

COMMON MISCONCEPTIONS

⚠ A pupil plots $(-3, 4)$ and $(3, -4)$ in the same spot — they see 'a 3, a 4 and a minus' and ignore which number the minus belongs to.

Plot both on the grid at once so the class sees two different dots. Trace each with a finger: 'the minus is on the first number here, so left; on the second there, so down.' The minus flips one direction only.

⚠ A pupil assumes every point has a quadrant number and tries to name one for $(0, -3)$.

Land $(0, -3)$ right on the axis and run a finger along the line. 'It's sitting on the fence, not in any field.' Points on an axis have no quadrant — say this out loud rather than letting it pass.

⚠ A pupil reverses the reading order — treats $(4, -1)$ as up 4, along -1 — so the dot lands in the wrong quadrant.

Say the rule aloud as they plot: 'first number along, second number up or down.' Have the pupil trace along the x-axis first, then move up or down, so the order is a physical habit not a guess.

DIFFERENTIATION

EMERGING

- Give these pupils the copybook grid with the axes already drawn and numbered -5 to $+5$, so they plot points rather than build the grid from scratch.
- Stay with one-flip points (like $(4, -1)$) at the board before the both-minus points; name the direction of each move aloud with them.

DEVELOPING

- After the copybook points, ask: give me a point that lands in the second quadrant with a first number of -4 . Then one more in the fourth.
- Add a justify step — beside each labelled point, write in one word why it's in that quadrant (e.g. 'left, up').

PROFICIENT

- During the Class Challenge stretch, ask pupils to name a fourth point that would line up with the three that already do, and explain how they knew before plotting it.
- Pose: which quadrant holds every point where the first number is bigger than the second, and both are negative? Let them test cases in their copy before answering.

✚ **Cross-curricular:** Tie to Geography — a compass-style map where the school is the origin and places sit left/right and up/down of it, each with its own (x, y) pair.

ANSWER KEY

Scaffold: visual check on the page

Q1: Quadrant 2

Q2: down (below the x-axis)

Q3: Quadrant 1

Q4: $(3, -4)$ is in the fourth quadrant, $(-3, 4)$ is in the second

a) Always : By definition the minus on x always moves the point left.

b) Always : Left and down is always the third quadrant.

c) Never : $(2, -5)$ is in the fourth quadrant and $(-2, 5)$ is in the second.

d) Never : Flipping the x sign always moves the point across the y-axis into a new quadrant.

EXTENSION SHEET · STRETCH ANSWERS

S1: $(8, -4) \rightarrow Q4$

S2: $(-6, 4) \rightarrow Q2$

S3: $(4, -4) \rightarrow Q4$

S4: $(-6, 9) \rightarrow Q2$