Teacher guidance

Key focus

This objective builds direction sense in two linked systems: the 8-point compass (N, NE, E, SE, S, SW, W, NW) and the three-figure bearing (a clockwise angle from North, always written with three digits, e.g. $072°$). Students move from naming and turning between compass directions, to reading and writing bearings, to calculating reverse bearings and the angle turned between two bearings, finishing with reasoning that wraps past $000°/360°$. Not covered in the Beta Textbook – resources are sourced from Dr Austin Maths bearings practice grids.

Suggested teaching sequence

1. Establish the 8-point compass rose (N, NE, E, SE, S, SW, W, NW) and practise naming the direction opposite, or halfway between, two given directions.
2. Practise turning: given a starting direction and a turn (quarter-, half-, three-quarter-turn, clockwise or anticlockwise), find the new direction.
3. Introduce the three-figure bearing: always measured clockwise from North, always written with three digits. Convert each of the 8 compass points to its bearing and back.
4. Read a bearing diagram (North line, ray to the destination, and the clockwise angle between them) and state the bearing shown.
5. Teach the reverse-bearing rule: if the original bearing is less than $180°$, add $180°$; if it is $180°$ or more, subtract $180°$.
6. Calculate the angle turned (clockwise) between two given bearings, including cases that wrap past $000°/360°$ and need $360°$ added or subtracted to land back in the $000°$–$360°$ range.

Core examples to model

- Compass to bearing: south-west $\rightarrow 225°$.
- Bearing to compass: $315° \rightarrow$ north-west.
- Reverse bearing (add $180°$): $060° \rightarrow 240°$.
- Reverse bearing (subtract $180°$): $300° \rightarrow 120°$.
- Turn between bearings: $020°$ to $110°$ is a $90°$ clockwise turn.
- Wrap-around: start on $250°$, turn $150°$ clockwise $\rightarrow 250 + 150 = 400$, $400 - 360 = 040°$.

Watch for

- Writing a bearing with fewer than three figures (e.g. $72°$ instead of $072°$) – three-figure bearings always have three digits, using a leading zero where needed.
- Adding or subtracting $180°$ the wrong way for a reverse bearing – the rule is add $180°$ when the original bearing is under $180°$, subtract $180°$ when it is $180°$ or over, so the result always stays in range.
- Forgetting to wrap a bearing back into the $000°$–$360°$ range after adding a turn (e.g. leaving

$405°$ instead of subtracting $360°$ to get $045°$).

- Measuring a bearing anticlockwise from North, or from a direction other than North – a bearing is always the clockwise angle from North.
- Confusing ”the bearing you are travelling on” with ”the bearing of your destination from your start point” when a question describes a multi-leg journey.

Checks for understanding

- Can students name the direction opposite, or halfway between, two compass points?
- Can they convert fluently between an 8-point compass direction and its three-figure bearing, in both directions?
- Can they read a bearing diagram and state the three-figure bearing shown?
- Can they calculate a reverse bearing using the add/subtract $180°$ rule?
- Can they find the number of degrees turned clockwise between two bearings, including when the turn wraps past $000°/360°$?