Match It and Write It

Three clues in both directions: the boundary (m and b), the line style (dashed is strict, solid is inclusive), the shaded side (above is greater, below is less). Write from a graph; eliminate graphs boundary first.

1 THE VOCABULARY
Words we use

Strict inequality < or >: dashed boundary.
Inclusive inequality ≤ or ≥: solid boundary.
Boundary y = mx + b, read as in Unit 3.
Shaded side above is y greater; below is y less.
Match by elimination boundary, then style, then side; cross out, do not plug in.

- **Watch out for these.**
- Reading the side before checking the boundary. Boundary first, always.
- Dashed means less than. Dashed means strict, either direction.
- Above means greater only when y is alone on the left, which it is when you read a graph as y = mx + b.
- Plugging in points to find the match. Use the clues; plug in only to check.

2 THE METHOD
Three clues, both ways

1. **CLUE 1: THE BOUNDARY** b where it crosses the y-axis, m as rise over run. y = mx + b.
2. **CLUE 2: THE STYLE** dashed: strict (< or >). Solid: inclusive (≤ or ≥).
3. **CLUE 3: THE SIDE** above: y greater. Below: y less. Put the sign together.
4. **TO MATCH BY ELIMINATION** run the clues in the same order against each graph; cross out any graph that breaks one; check the one left.
5. **VERTICAL, HORIZONTAL** x = a shaded right is x > a; y = a shaded above is y > a.

WHY BOUNDARY FIRST
The boundary is the hardest thing to fake: a wrong m or b rules a graph out no matter how it is shaded. Style and side then split the survivors quickly.

3 READ AND WRITE
A dashed line crossing at 2, falling 1 per 1, shaded below

b = 2, m = −1	clue 1: the boundary is y = −x + 2
dashed	clue 2: strict sign
shaded below	clue 3: y less than
y < −x + 2	the inequality
check (0, 0): 0 < 2	true, and (0, 0) is in the shaded part. Agrees

ELIMINATING WITH THE SAME CLUES
Against four graphs: cross out the wrong boundary, then the wrong style, then the wrong side. Say the clue for each cross-out.

SAY IT OUT LOUD
Boundary, style, side. Dashed is strict, solid is inclusive. Above is greater, below is less.

Unit 5, Lesson 3 in one line: a region is three clues, boundary, style, and side; read them to write the inequality, and run them in order to eliminate wrong graphs.