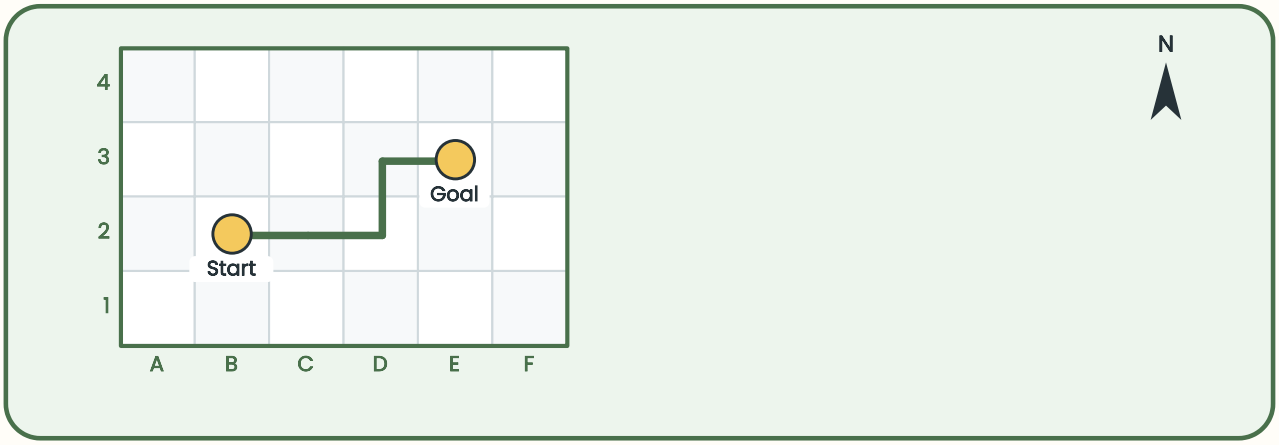
FREE STARTER

GRADES 3–5

# Lantern Valley and Beyond: Map and Route Reasoning Puzzles

6 complete activities from Map & Route Reasoning, each with a worked answer.




HOW TO USE

1. Read the situation and the evidence first.
2. Show your thinking in the work boxes, not only an answer.
3. Explain how you know your answer makes sense.
4. Try the new problem at the bottom of the page.

6 activities • 3 answer pages • From the 24-activity collection

10 US Letter pages • Print at 100% / Actual Size

Original Bobotemp educational printable • Fictional names, places and prices

Name _____ Date _____

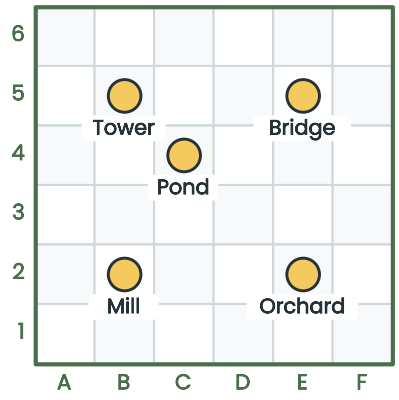
## Lantern Valley Landmark Hunt

LEVEL 1 ●○○

Use the map key. Columns A-F run west to east. Rows 1-6 increase toward the north. Name a cell by letter first, then number.

Lantern Valley has five landmarks on a 6-by-6 grid. Each landmark sits inside one cell. Read both clues, and find the one landmark that fits them. Clue 1: The landmark is in column E. Clue 2: The landmark is north of row 3 (in row 4, 5, or 6).

LANTERN VALLEY




Map key
Columns A-F: west to east
Rows 1-6: south to north

N

1. List every landmark in column E.

2. List every landmark north of row 3.

3. Name the landmark that fits both clues.

TRY IT • Which landmark is in row 2 and west of column D?

Name _____ Date _____

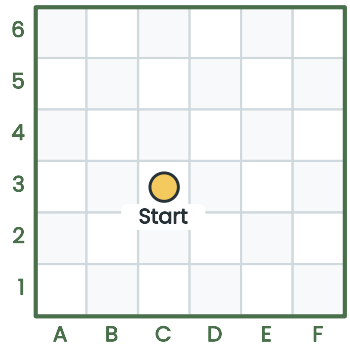
## Direction Relay from C3

LEVEL 1 ●○○

Move one full cell for each step. East means the next letter. North means the next higher row number.

A runner starts in cell C3 on the Lantern Valley map. She follows these moves in order: 2 squares east, 3 squares north, 1 square west. Find the cell where she stops. Then describe her net change from start to finish: how far east or west, and how far north or south?

LANTERN VALLEY




N

EVIDENCE TO USE

- Start: C3
- Move 1: 2 east
- Move 2: 3 north
- Move 3: 1 west
- East = next letter; west = letter before
- North = higher row number

1. Write the cell after each move.

2. Name the final cell.

3. Find the net east-west and north-south changes.

TRY IT • Start at B1. Move 3 north, 2 east, then 1 south. Where do you stop?

Name _____ Date _____

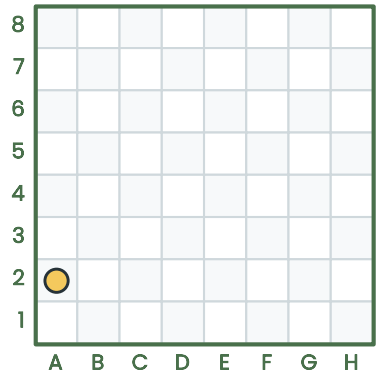
# Net Change Shortcut

LEVEL 2 ●●○

Combine opposite moves first. Then write a shorter instruction that reaches the same cell.

On the Saltmarsh grid, columns A–H run west to east, and rows 1–8 run south to north. A messenger starts at A2 and follows these moves in order: 5 east, 2 west, 3 north, 1 south, 4 east. Find the final cell. Then write a shortcut using two direction instructions, one east-west and one north-south, that reaches the same cell.

SALTMARSH




Dot in A2 = Start

N

EVIDENCE TO USE

- Start: A2
- Moves: 5 E, 2 W, 3 N, 1 S, 4 E
- Columns A–H west to east
- Rows 1–8 south to north

1. Find the net east-west change.

2. Find the net north-south change.

3. Name the final cell and write the shortcut.

TRY IT • Start at A1. Move 4 north, 6 east, 1 south, and 2 west. Give the final cell and the shortcut.

Name _____ Date _____

## Willowmere Reverse Scale

LEVEL 2 ●●○

You know the real distance. Undo the scale to find the number of map squares.

On the Willowmere county map, 1 grid square = 4 miles. The Long Canal runs straight east for 36 miles. The Short Canal runs straight north for 20 miles. How many grid squares long should each canal be drawn on the map? How many more squares long is the Long Canal?

EVIDENCE TO USE

- Scale: 1 grid square = 4 miles
- Long Canal: 36 miles, straight east
- Short Canal: 20 miles, straight north

1. Find the number of squares for the Long Canal.

2. Find the number of squares for the Short Canal.

3. Find the difference in squares.

TRY IT • On another map, 1 square = 6 miles. A road is 42 miles long. How many squares is it?

Name _____ Date _____

## Fractional Trails at Thistle Lake

LEVEL 3 ●●●

Rename the fractions with a common denominator before you add or subtract.

Trail A around Thistle Lake has three parts: 1 1/2 mi, 2 3/4 mi, and 1 5/8 mi. Trail B is a single path that is 6 1/4 mi long. Find the total length of Trail A as a mixed number. Which trail is shorter, and by how much? Show how you renamed the fractions.

EVIDENCE TO USE

- Trail A part 1: 1 1/2 mi
- Trail A part 2: 2 3/4 mi
- Trail A part 3: 1 5/8 mi
- Trail B: 6 1/4 mi

1. Rename each length using eighths.

2. Find the total length of Trail A.

3. Compare the trails and find the difference.

TRY IT • A path has two parts: 2 1/4 mi and 1 3/8 mi. How long is it?

Name _____ Date _____

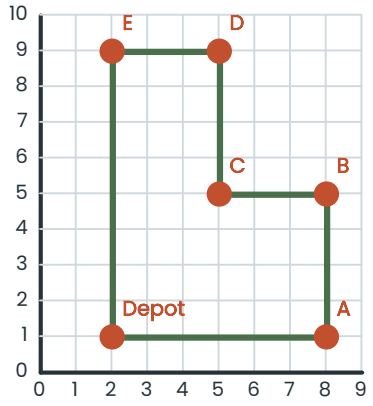
# Sunfield Coordinate Delivery Loop

LEVEL 3 ●●●

Stops are intersections named (x, y). On each leg, one coordinate stays the same. Subtract the coordinate that changes, larger minus smaller.

A delivery cart in Sunfield Village travels only along the grid lines of a first-quadrant coordinate plane. In each stop (x, y), x tells how far east and y tells how far north. The cart starts at the Depot, visits Stops A through E in order, and returns to the Depot. Find each leg's length by subtracting coordinates. Then find the total length of the loop.

SUNFIELD DELIVERY LOOP (1 UNIT = 1 BLOCK)




EVIDENCE TO USE

- 1 unit = 1 block
- Depot (2, 1)
- Stop A (8, 1)
- Stop B (8, 5)
- Stop C (5, 5)
- Stop D (5, 9)
- Stop E (2, 9), then back to the Depot

1. Find the length of each of the six legs.

2. Add to find the loop total.

3. Explain which coordinate you subtracted on each leg.

TRY IT • A cart goes from (3, 4) to (3, 10), then to (8, 10). How many units does it travel?

## 1. Lantern Valley Landmark Hunt

LEVEL 1

**Bridge (cell E5)**

WORKED REASONING • Clue 1: Column E holds the Orchard (E2) and the Bridge (E5). Clue 2: Rows 4-6 hold the Bridge (E5), the Tower (B5), and the Pond (C4). Only the Bridge is on both lists, so the landmark is the Bridge at E5.

WATCH FOR • Students may read the number first or count rows from the top of the page. On these maps, the letter always comes first, and row 1 is the southernmost row, so a bigger row number means farther north.

TRANSFER • The Mill (B2). The Orchard is also in row 2, but column E is east of column D.

## 2. Direction Relay from C3

LEVEL 1

**She stops at D6. The net east-west change is 2 - 1 = 1 square east, and she moved 3 squares north.**

WORKED REASONING • C3, then 2 east, reaches E3. E3, then 3 north, reaches E6. E6, then 1 west, reaches D6. Net change: 2 east - 1 west = 1 square east, plus 3 squares north. Check: C plus 1 letter is D, and row 3 + 3 = row 6, so the final cell is D6.

WATCH FOR • Students may move west to a later letter, or they may ignore that the last move undoes part of the first one. West always moves back one letter, so 2 east and 1 west leave a net of only 1 east.

TRANSFER • D3 (B1 to B4 to D4 to D3)

## 9. Net Change Shortcut

LEVEL 2

**The net east-west change is 9 - 2 = 7 east, and the net north-south change is 3 - 1 = 2 north. The final cell is H4, and the shortcut is 7 east, 2 north.**

WORKED REASONING • East moves total 5 + 4 = 9, and west moves total 2, so the net change is 9 - 2 = 7 east. North is 3 and south is 1, so the net change is 2 north. A plus 7 letters is H, and row 2 + 2 = row 4, so the final cell is H4. Trace to check: A2, F2, D2, D5, D4, H4. The shortcut, 7 east then 2 north, is 9 one-square moves instead of 15.

WATCH FOR • Students may add all the moves (15) as if they all went the same way, or they may subtract only the first pair. Group each direction, and then cancel the opposites: east against west, north against south.

TRANSFER • The final cell is E4, and the shortcut is 4 east, 3 north.

## 10. Willowmere Reverse Scale

LEVEL 2

**Long Canal: 36 ÷ 4 = 9 squares. Short Canal: 20 ÷ 4 = 5 squares. The Long Canal is 4 squares longer.**

WORKED REASONING • Each square stands for 4 miles, so count the groups of 4. 36 ÷ 4 = 9 squares (check: 9 × 4 = 36). 20 ÷ 4 = 5 squares (check: 5 × 4 = 20). Difference: 9 - 5 = 4 squares, which is 4 × 4 = 16 miles, and 36 - 20 = 16 agrees.

WATCH FOR • Students may multiply 36 × 4 = 144 because the scale was used that way before. Going from miles back to squares undoes the scale, so divide.

TRANSFER • 42 ÷ 6 = 7 squares

## 17. Fractional Trails at Thistle Lake

LEVEL 3

**Trail A is 5 7/8 mi, so it is shorter by 6 1/4 - 5 7/8 = 3/8 mi (0.375 mi).**

WORKED REASONING • Use eighths: 1 4/8 + 2 6/8 + 1 5/8 = 4 15/8 = 4 + 1 7/8 = 5 7/8 mi. Compare with Trail B: 6 1/4 = 6 2/8 = 5 10/8. Then 5 10/8 - 5 7/8 = 3/8 mi, so Trail A is 3/8 mile shorter. As decimals: 1.5 + 2.75 + 1.625 = 5.875, and 6.25 - 5.875 = 0.375.

WATCH FOR • Students may add numerators and denominators (1/2 + 3/4 = 4/6), or they may leave 4 15/8 without renaming it. Fractions must share a denominator, and 15/8 must be renamed as 1 7/8.

TRANSFER • 2 2/8 + 1 3/8 = 3 5/8 mi

## 18. Sunfield Coordinate Delivery Loop

LEVEL 3

**The legs are 6 + 4 + 3 + 4 + 3 + 8 = 28 units.**

WORKED REASONING • Depot to A: same y, 8 - 2 = 6. A to B: same x, 5 - 1 = 4. B to C: same y, 8 - 5 = 3. C to D: same x, 9 - 5 = 4. D to E: same y, 5 - 2 = 3. E to Depot: same x, 9 - 1 = 8. Total: 6 + 4 + 3 + 4 + 3 + 8 = 28 units.

WATCH FOR • Students may subtract the coordinate that stays the same, or they may count grid points instead of spaces (getting 7 for Depot to A). Find the coordinate that changes, and subtract the smaller value from the larger.

TRANSFER • 6 + 5 = 11 units