

The Missing First-Aid Box

Sports Day begins soon. The equipment store is at $A(2, 1)$ and the first-aid tent is at $B(6, 4)$. The route must be written as one exact vector.

THE MISSION

Choose and prove the route that moves the box from $A(2, 1)$ to $B(6, 4)$:
 $(4, 3)$, $(8, 5)$, or $(-4, -3)$.

Clear situation. Visible reasoning. A decision you can defend.

Lesson at a glance

**CURRICULUM
FOCUS**

Senior 2 Mathematics - Vectors and Translation. Suggested time: 60-75 minutes or two classroom periods.

Learning outcomes

describe horizontal and vertical movement; find a vector using destination minus start; translate a point; add vectors and verify a route

Teaching sequence

1. Read the situation without calculating.
2. Ask learners to identify known and unknown information.
3. Build the mathematical representation together.
4. Model one worked example and explain each decision.
5. Let learners complete the quick checks.
6. Finish with the scenario challenge and a written justification.

TEACHER PROMPT

Do not ask only, 'What is the answer?' Ask, 'What does this number mean in the situation, and how can we check it?'

Foundation teaching notes

Horizontal first

Compare x-coordinates. Right is positive and left is negative.

Vertical second

Compare y-coordinates. Up is positive and down is negative.

Check the route

Add the vector to the starting point. The result must be the destination.

Worked model

FIND AB

A(2, 1) to B(6, 4): $(6 - 2, 4 - 1) = (4, 3)$.

TRANSLATE

R(-1, 2) + (5, -3) = (4, -1).

COMBINE

$(3, 2) + (-1, 4) = (2, 6)$.

Practice answers

1. (4, 5)
2. (-1, 4)
3. (3, 2)
4. The first component changes x ; the second changes y .

Support

Keep the situation visible. Let learners label quantities and units before calculating. Break one long method into short decisions and require a check after the answer.

Stretch

Ask learners to change one number in the situation, predict how the answer will change, then solve and compare with the prediction.

Final scenario - complete response

CHALLENGE

Choose and prove the route that moves the box from A(2, 1) to B(6, 4): (4, 3), (8, 5), or (-4, -3).

The correct vector is (4, 3). Check: $(2, 1) + (4, 3) = (6, 4)$.

What a strong response contains

- a correct mathematical representation;
- visible calculation steps;
- a check against the original situation;
- a clear final sentence that answers the real problem.

EXIT TICKET

Ask the learner to complete: 'My answer is reasonable because ...'