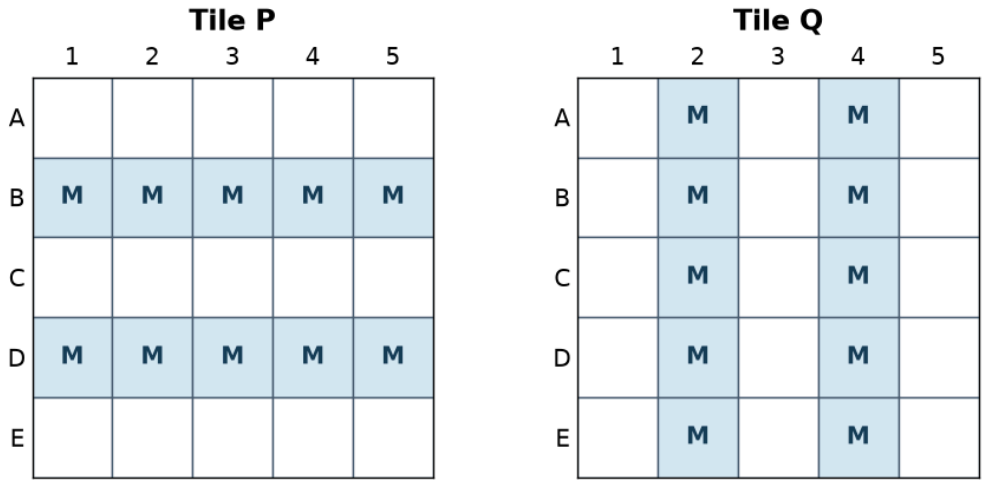
Tracing Conducting Paths Across Two Tiles

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A floor sensor uses square tiles made of conducting squares, marked M, and insulating squares. A current path can cross from one M square to another only when they share a full edge. The current contacts touch every square along the two edges being tested.



Tile models. M marks a conducting square.

1 Which tile can conduct from its left edge to its right edge without changing any squares?

(1) P only

(2) Q only

(3) Both tiles

(4) Neither tile

2 The two tiles each have ten M squares. Name one complete path in each tile and identify the opposite edges it connects. [1]

Answer and work

The team turns square C2 in Q into an insulating square. No other squares change.

3 Explain whether Q still has a top-to-bottom path. Identify the path or the break that determines your answer. [1]

Answer and work

4 Return to tile P. Name three squares to change to M for a path from row A to row E. Explain why at least three squares must change. [1]

Answer and work