Reading Light Through Turned Sheets

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

A display sends 100 light units through sheets that select a direction of light vibration. The first sheet passes 50 units and sets their vibration direction. Each later sheet acts on the light reaching it. It passes all light aligned with its own direction, none at 90°, and half at 45°. Any light it passes leaves aligned with that sheet.

Trial	First sheet	Last sheet
P	Horizontal	Horizontal
Q	Horizontal	Vertical

1 Which trial lets more light reach a detector after the last sheet?

(1) P only

(2) Q only

(3) Both pass the same amount.

(4) Both block all of it.

2 Use the direction of the light between the sheets to explain why the last sheet in Q blocks the light. [1]

Answer and work

The display repeats Q with a third sheet between the original two. The middle sheet is at 45° to both original sheets.

3 Calculate the amount reaching the final detector. Track the light through all three sheets. [1]

Answer and work

4 A student says adding a sheet can only decrease the amount reaching the detector. Evaluate the claim with the two Q arrangements. [1]

Answer and work