Choosing Two Filters for a Print Display

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

A print display uses filters to reduce ultraviolet radiation while keeping the print visible. Each fraction in the table is the part of the incoming light that leaves one layer. In the classroom model, each layer passes the same fraction whether it is used alone or after another layer.

Filter	Fraction of ultraviolet passed	Fraction of visible light passed
J	0.30	0.90
K	0.40	0.85
L	0.20	0.60

1 Which single filter passes the smallest fraction of ultraviolet radiation?

(1) J

(2) K

(3) L

(4) All pass the same fraction.

2 Calculate the fraction of the original ultraviolet radiation that passes through J and then K. [1]

Answer and work

The display requires an ultraviolet transmission fraction of at most 0.15 and a visible transmission fraction of at least 0.75. The team will use either J followed by K or J followed by L.

3 Choose the stack that meets both requirements. Use the two transmission fractions to explain your decision. [1]

Answer and work

4 In this model, would reversing J and K change the amount of visible light reaching the print? Explain. [1]

Answer and work