Checking Colored Glass Under Two Lamps

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

A glass workshop sorts two panels using a lamp and a light meter. The meter reads how much light passes through a panel. In the classroom model, reflection and scattering are negligible, so light that does not pass through is absorbed. The class uses narrow bands of red light and blue light.

Panel	Red light transmitted (%)	Blue light transmitted (%)
M	80	20
N	80	65

1 Calculate the percentage of the blue light that panel M absorbs in this model. Show your setup. [1]

Answer and work

2 Which lamp by itself can distinguish M from N using the light meter?

(1) The red lamp only

(2) The blue lamp only

(3) Either lamp by itself

(4) Neither lamp

On a second test a technician gets different meter readings with the two lamps, even with the panel removed. The meter reports the amount of light that reaches it.

3 Explain how the technician can use the readings with the panel removed to compare transmission percentages fairly. [1]

Answer and work

4 A student claims that increasing the blue lamp’s brightness changes blue photons into red photons. Explain why increasing the brightness at the same wavelength does not change the photon energy. [1]

Answer and work