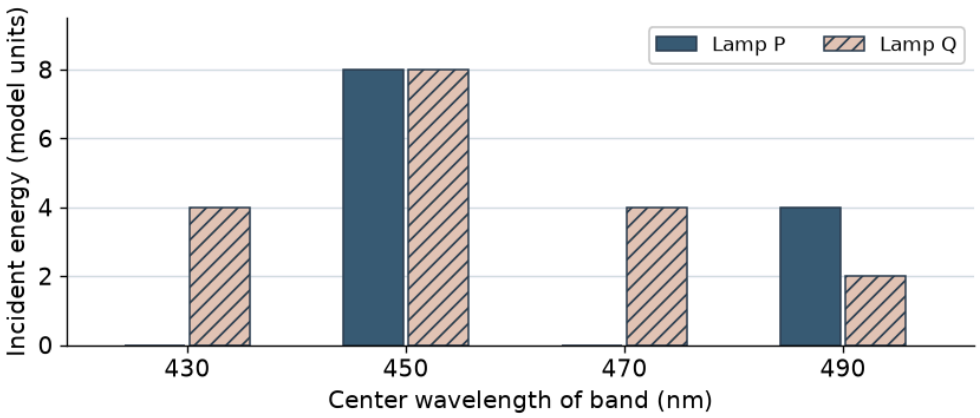
Comparing Light Bands With the Same Peak

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

A museum tests a light-sensitive coating with two lamps. Each plotted bar gives incident energy in one wavelength band. The coating absorbs all energy from the bands centered at 430, 450, and 470 nm. It absorbs none from the band centered at 490 nm in this model.



Incident energy by wavelength band for the two lamps.

1 Which lamp sends more energy into the coating's three absorbing bands?

(1) P only

(2) Q only

(3) Both send the same amount.

(4) The graph cannot compare them.

2 Calculate the total incident energy that the coating does not absorb from each lamp. [1]

Answer and work

3 A student uses the equal 450 nm peaks to say both lamps transfer equal energy to the coating. Evaluate the claim using all absorbing bands. [1]

Answer and work

A filter now passes only the 450 nm band to the coating. It passes that entire band from either lamp.

4 Predict the absorbed-energy comparison after the filter is added. Explain what changed about the evidence the coating receives. [1]

Answer and work