Checking a Light Pulse on Two Card Areas

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

A class tests a light-sensitive display card. Each pulse spreads its energy uniformly over the listed area. The coating changes color in any region that receives at least 3 model energy units per square centimeter during the pulse. Both pulses have the same wavelength.

Pulse	**Total energy (units)**	**Area illuminated (cm^2)**
J	24	6
K	24	12

1 Which pulse is predicted to change the coating’s color over its illuminated area?

(1) J only

(2) K only

(3) Both pulses

(4) Neither pulse

2 Explain why equal total energy and wavelength do not give the same coating result in the two trials. [1]

Answer and work

A new pulse must cover 10 cm^2. The coating still needs at least 3 energy units per square centimeter. The energy remains uniform across the lit area.

3 Calculate the least total pulse energy that would change the color over the new area. [1]

Answer and work

4 Choose two energy levels to test near the predicted 30-unit threshold. State one condition to keep the same and what pattern would support the prediction. [1]

Answer and work