Accounting for Water in a Condensing Box

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

A sealed classroom model contains air and water vapor. A cool panel inside the box causes some vapor to condense. No water enters or leaves the box. The class records the mass of water in the gas phase and the mass of liquid on the panel.

Stage	Water in vapor (g)	Water on panel (g)
Before cooling	8.0	0.0
After cooling	5.0	3.0

1 Which statement describes the change in the water during cooling?

(1) Three grams of water changed from gas to liquid.

(2) Three grams of water changed from liquid to gas.

(3) The panel created three grams of new water.

(4) The box lost three grams of total water.

2 Explain why energy can pass from the condensing water to the cool panel. Refer to the change from gas to liquid. [1]

Answer and work

The class estimates that condensation transfers about 2.4 kJ to the panel per gram condensed. In a second run under the same model, 1.5 g condenses.

3 Estimate how much more energy transfers from condensation in the first run than in the second. Show how both masses enter the calculation. [1]

Answer and work

4 Would the same reading for panel temperature in both runs establish that condensation transferred the same energy? Explain using the model. [1]

Answer and work