Separating Leaf Uptake From Water Uptake

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

A classroom pond model seals two chambers under the same light. One contains water and a plant. The blank contains the same amount of water but no plant. Carbon dioxide can move between the chamber air and the water. In this model, any net carbon gain not in air or water is retained by the plant. No carbon enters or leaves a chamber.

Chamber	Carbon lost from air (units)	Carbon gained by water (units)
Blank	6	6
With plant	8	4

1 What does the blank show about the decrease of carbon dioxide in the air?

(1) A plant is required for any decrease.

(2) The water alone can account for a decrease.

(3) The carbon must have left the sealed chamber.

(4) The water always loses carbon when air does.

2 Calculate the net carbon retained by the plant. Use both measurements from its chamber. [1]

Answer and work

3 A student subtracts the blank's air loss from the plant chamber's air loss to report two units retained. Explain why that calculation misses the measured result. [1]

Answer and work

A later plant run loses five units from the air. Its water gains only one unit. The model has the same carbon accounting rules.

4 Compare net carbon retained by the plant in the later and original runs. [1]

Answer and work