Reading Leaf Gas Exchange at Fixed Pressure

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

A sealed leaf chamber holds dry gas at fixed volume and temperature. The model records particle counts for carbon dioxide, oxygen, and nitrogen. Total pressure is proportional to the total particle count. During the observation, the model allows carbon dioxide and oxygen to change through photosynthesis and respiration. Nitrogen does not participate.

Reading	Carbon dioxide	Oxygen	Nitrogen
Start	12	8	80
After a light interval	8	12	80
After a dark interval	10	10	80

1 What happens to the total gas count during the light interval?

(1) It increases by four.

(2) It decreases by four.

(3) It increases by eight.

(4) It stays the same.

2 Use both changing gas counts to describe the net exchange during the light interval. [1]

Answer and work

3 Compare the direction of net exchange during the dark interval with the earlier direction. [1]

Answer and work

A replacement chamber reports total pressure alone. It gives the same pressure at the three observation times.

4 Explain why equal pressure does not establish that the same processes dominated all three readings. Name one separate measurement that could reveal the change. [1]

Answer and work