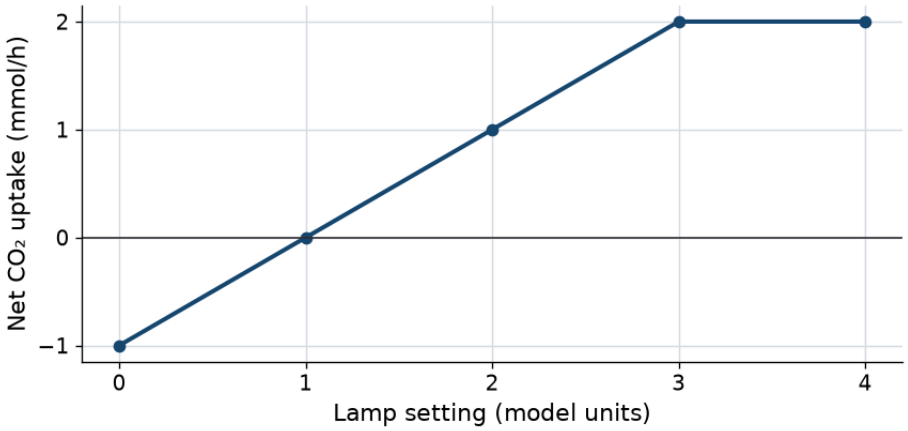
Planning Light Hours for a Plant Chamber

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

A classroom simulation keeps one plant in a sealed chamber. The graph shows how lamp setting changes its net uptake of carbon dioxide. A positive value means carbon dioxide leaves the chamber air and enters the plant on balance. A negative value means the plant releases more to the air than it removes.



Measured net carbon dioxide exchange in the model.

1 At which setting do the modeled rates of carbon dioxide production and removal match?

(1) 0

(2) 1

(3) 2

(4) 3

2 A student says increasing the setting from 3 to 4 must increase net uptake. Use the graph to evaluate that claim. [1]

Answer and work

The lamp can be on for eight hours each day. It is off at setting 0 for the other sixteen hours. In the model the displayed rate is constant during each part of the day. The class wants no net increase of carbon dioxide in the air over the full day.

3 If the lamp uses setting 3 when on, calculate the full-day net uptake. Show how the hours at both settings enter the result. [1]

Answer and work

4 Would setting 2 meet the same full-day requirement? Use the graph and the daily schedule. [1]

Answer and work