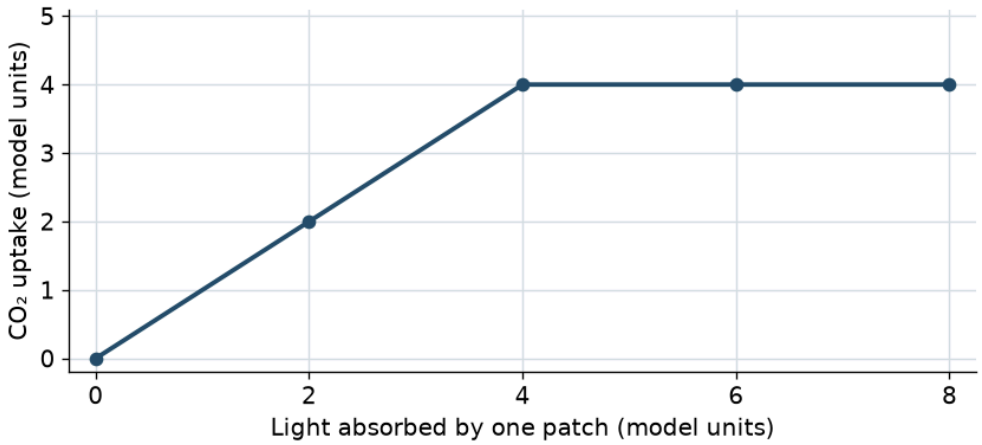
Spreading Light Across Two Leaf Patches

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

An exhibit represents a leaf with two equal patches. Both patches have the same response to absorbed light. The graph shows carbon dioxide uptake through photosynthesis for one patch at different light readings. The model treats the two patches as independent and adds their uptake values for the whole leaf.



Carbon dioxide uptake through photosynthesis in one model patch.

1 One patch absorbs four light units and the other absorbs four. Find the whole-leaf uptake using the graph. [1]

Answer and work

2 What whole-leaf uptake does the graph predict if the first patch absorbs eight light units and the second absorbs zero?

(1) 0 units

(2) 4 units

(3) 8 units

(4) 16 units

3 A student says equal total absorbed light gives equal whole-leaf uptake in the two arrangements. Evaluate the claim using the shape of the graph. [1]

Answer and work

A third arrangement sends six absorbed light units to one patch and two to the other.

4 Calculate the uptake for the third arrangement and compare it with the earlier arrangements. [1]

Answer and work