9Bb PLANT ADAPTATIONS

1a Complete the table to show how plants get what they need for growth.

Substance	Where it comes from in the environment	How plants use it
oxygen	*air*	aerobic respiration to break down glucose
carbon dioxide	*air*	photosynthesis to produce glucose
nitrate salts	*soil*	to make proteins from glucose
magnesium salts	*soil*	*to make chlorophyll*
potassium salts	*soil*	to help root cells absorb water properly
water	*soil*	for dissolving substances for transport, photosynthesis keeping leaves cool, filling cells to keep them firm

b Check your answers with a partner to look for any errors. Mark any changes in a different colour.

2 Draw lines to link each part of a leaf to how it helps the plant photosynthesise.

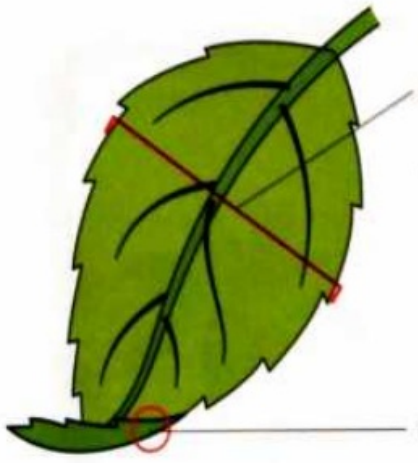
palisade cells	carries water and mineral salts from the roots
phloem	allow gases to enter and leave the leaf
xylem	carries dissolved sugars from the leaf to other plant parts
stomata	contain many chloroplasts where they receive most light

SB **3** How are the following cells adapted for their functions?

a xylem cells They are hollow (so can form tubes).

b root hair cells They have a large surface area (and so can absorb water quickly).

4 Label the diagram to explain how the shape of a leaf helps it carry out photosynthesis.



large surface area for capturing as much light as possible (for photosynthesis)

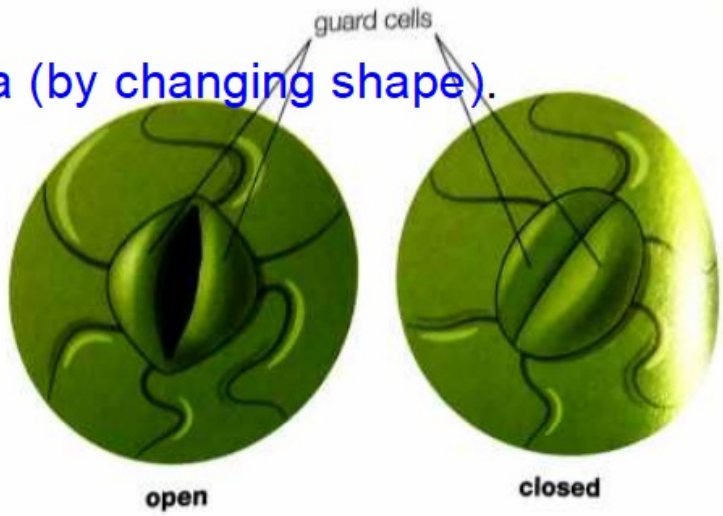
short distance for gas exchange increases rate of diffusion/helps efficient gas exchange

9Bb GAS EXCHANGE

1 The diagrams show a stoma in the lower epidermis of a leaf at two different times of day.

a State the function of guard cells.

To open and close the stoma (by changing shape).



b Name *two* gases exchanged between the leaf and air through stomata.

oxygen, carbon dioxide, water vapour

c Which diagram shows a stoma at night? Give a reason for your answer.

Closed, because stomata close at night.

d Explain why stomata open and close at different times of day.

Stomata open during the day to allow rapid diffusion of carbon dioxide into the leaf for photosynthesis. Stomata close at night to reduce water loss (when photosynthesis is not happening).

2 Choose the correct words from the box to complete the text to explain how changing concentration of gases in the leaf affects gas exchange.

concentration	fall	photosynthesis	rapidly	respiration	rise	slowly

In bright light, *photosynthesis* takes up carbon dioxide from the air inside the leaf. This causes the *concentration* of carbon dioxide in the leaf to *fall*. So carbon dioxide diffuses more *rapidly* into the leaf.

3 The two potted plants had the same amount of light and water, but the one on the left was in a cooler place than the one on the right.

Cross out the wrong words to explain why the plant on the right has wilted.

When temperatures are higher, the speed of particles *decreases / increases*. This causes the rate of evaporation inside the leaf to *decrease / increase* and the rate of diffusion of water vapour out of the leaf to *decrease / increase*. This results in *a decrease / an increase* in the amount of water in the leaf. If this is not replaced by *more / less* water coming up from the roots, the plant wilts.