

Leaves, water uptake and extreme environments

Triple only

Why is the palisade mesophyll near the top of the leaf?

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What is the function of the air spaces in the spongy mesophyll?

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What does the waxy cuticle do?

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Why is a leaf broad, flat and thin?

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Why is the upper epidermis transparent?

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How does increasing light intensity affect water uptake?

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How does increasing air movement affect water uptake?

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How does increasing temperature affect water uptake?

They allow carbon dioxide to diffuse through the leaf to the cells, and oxygen to diffuse out.

It has many chloroplasts and most photosynthesis happens here, close to the light.

A large surface area absorbs light, and a thin leaf gives a short diffusion distance for gases.

It is waterproof, so it reduces water loss by evaporation from the leaf surface.

It increases it, because the stomata open and more water vapour diffuses out.

To let light pass through to the palisade cells below.

It increases it, because water evaporates faster and water vapour diffuses out faster.

It increases it, because water vapour is carried away, keeping a steep concentration gradient.

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What does a potometer measure?

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How do you calculate a rate of water uptake?

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How do you calculate percentage change in mass?

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How does leaf size and shape help plants in dry places?

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How does a thick cuticle help plants in extreme environments?

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How can stomata be adapted to reduce water loss?

Rate = change in quantity (such as distance moved or volume) $\div$ time.

The rate of water uptake of a leafy shoot, from the movement of an air bubble in a capillary tube.

Small, narrow or rolled leaves, or spines, have a small surface area so less water evaporates.

$(\text{change in mass} \div \text{original mass}) \times 100$.

Fewer stomata, stomata in pits, or stomata that are closed during the day.

It is waterproof, so less water evaporates from the leaf surface.