

# AQA Biology GCSE

## 2.3 - Plant Tissues, Organs and Systems

### Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



How is epidermal tissue adapted for its function?



# How is epidermal tissue adapted for its function?

Epidermal tissue covers the entire plant. It has a waxy cuticle which helps reduce water loss from the leaf surface.



How is palisade mesophyll tissue adapted for its function?



How is palisade mesophyll tissue adapted for its function?

Palisade mesophyll tissue contains lots of chloroplasts which allows photosynthesis to progress at a rapid rate.



How is spongy mesophyll tissue adapted for its function?



How is spongy mesophyll tissue adapted for its function?

Spongy mesophyll tissue has lots of air spaces which allow gases (including oxygen and carbon dioxide) to diffuse in and out.



# How is the xylem adapted for its function?





# How is the xylem adapted for its function?

- Made up of dead cells which form a continuous hollow tube - allows the movement of water and mineral ions from the roots to the leaves.
- Strengthened by lignin - makes the vessel strong and waterproof.
- Has bordered pits - allow minerals to be transported to specific places.



How is the phloem adapted for its function?



# How is the phloem adapted for its function?

- Made up of elongated living cells.
- Cells have sieve plates that connect them together - cell sap can move through plates into other cells.
- Sieve tube cells have few organelles to allow the efficient transport of substances.



How is meristem tissue adapted for its function?



# How is meristem tissue adapted for its function?

Made up of stem cells which can differentiate into many different cell types, allowing the plant to grow.



# What tissues does the leaf organ contain?



# What tissues does the leaf organ contain?

- Epidermis
- Palisade mesophyll
- Spongy mesophyll
- Xylem
- Phloem
- Guard cells



# What is the function of guard cells?





# What is the function of guard cells?

Guard cells control the opening and closing of the stomata, according to the water content of the plant.



# How are stomata adapted for their function?



# How are stomata adapted for their function?

Stomata allow the control of gaseous exchange and water loss from the leaf.

- More stomata on the base of the leaf - minimises water loss as this side is cooler and shaded.
- Have guard cells which control their opening and closing.



How are root hair cells adapted for their function?



# How are root hair cells adapted for their function?

Root hair cells allow the uptake of water and mineral ions from the soil.

- Large surface area - maximises rate of absorption.
- Contain lots of mitochondria -- release energy for active transport of mineral ions.



# What is translocation?



# What is translocation?

Translocation is the movement of dissolved sugars from the leaves to other parts of the plant.



# What is transpiration?





# What is transpiration?

Transpiration is the evaporation of water vapour from the surface of a plant.



# How does transpiration work?



## How does transpiration work?

- Water evaporates from the leaf surface via the stomata.
- Water molecules cohere together - more water is pulled up the xylem in an unbroken column.
- More water is taken up from the soil - creating a continuous transpiration stream.



How does temperature affect the rate of transpiration?



# How does temperature affect the rate of transpiration?

Increasing the temperature increases the rate of transpiration.

- Higher rate of evaporation and diffusion of water - therefore rate of transpiration is increased.



How does humidity affect the rate of transpiration?



# How does humidity affect the rate of transpiration?

Increasing relative humidity decreases the rate of transpiration.

- High relative humidity will reduce the water vapour concentration gradient. The rate of evaporation will decrease, and so will the rate of transpiration.



How does wind speed affect the rate of transpiration?





## How does wind speed affect the rate of transpiration?

Increasing wind speed/air movement increases the rate of transpiration.

- Increased air movement lowers water vapour concentration outside of the leaf. This increases the water vapour concentration gradient, thereby increasing the rate of evaporation and transpiration.



# How does light intensity affect the rate of transpiration?



## How does light intensity affect the rate of transpiration?

Increasing the light intensity increases the rate of transpiration.

- The rate of photosynthesis increases, so more stomata open. This allows the rate of evaporation to increase, increasing the rate of transpiration.

