GCSE Biology (Separate AND Trilogy)
Success Criteria: Plant Transport and Exchange systems

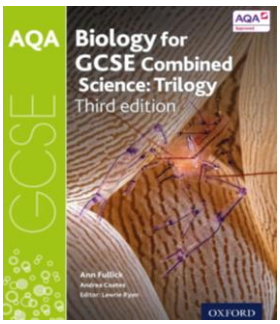
I can…	
Describe the leaf of a plant as an organ responsible for photosynthesis. Leaves are specially adapted for gas exchange and absorption of light energy.	
Describe the structure of a leaf including epidermis, palisade and spongy mesophyll and guard cells surrounding stomata (mostly found on lower epidermis)	
Relate the structure of each tissue to the function.	
Describe how the roots, stem and leaves of a plant form a system for transport of substances around the plant.	
Explain that root hair cells are adapted for the absorption of water and mineral ions by having a large surface area, and lots of mitochondria for active transport.	
State that tubes called xylem transports water and mineral ions from the roots up through the stems and to the leaves. *(X W…xylem water)*	
Describe how plants lose water vapour from their leaves by evaporation and diffusion through open stomata. This is called transpiration.	
Describe how the rate of transpiration is affected several factors including humidity, temperature, air movement, light intensity.	
Explain these effects; • Light intensity (stomata open to gain CO_2 for photosynthesis = increased water loss) • Temperature (warmer means faster evaporation and faster diffusion = increased water loss) • Humidity (more water in air outside of plant means smaller concentration gradient so slower diffusion = less water lost) • Air movement (water vapour outside leaf carried away by wind so bigger concentration gradient = more water lost)	
Explain that as water is lost from the leaf via the stomata, new water is drawn up the plant via the xylem from the roots in a continuous stream. This is called the transpiration stream.	
Identify the need for transpiration and transpiration stream in drawing fresh water up to the leaf for photosynthesis and delivering minerals.	
Recognise that in dry conditions too much transpiration will lead to wilting (water can not be replaced, cells become flaccid). Plants close their stomata when water stressed to prevent too much water loss.	
Describe how a simple potometer can be used to investigate factors that affect the rate of water uptake (estimates the rate of transpiration). Remember that some water taken in to plant will be used to fill plant cells (turgid) and used in photosynthesis…not all will leave by transpiration.	
State that phloem tubes transport dissolved sugars from the leaves to the rest of the plant for immediate use or storage for later. (mmm…phloem sounds nice, sugar is nice)	
Define the movement of food (sugars) through phloem as translocation.	
Identify translocation as an active process.	
Compare the structures of Xylem (dead, hollow, no end walls, strengthened with lignin) and Phloem (living, sieve plates at end of cells for support, companion cells with lots of mitochondria) and relate the structure to their functions.	

AQA exam specification:

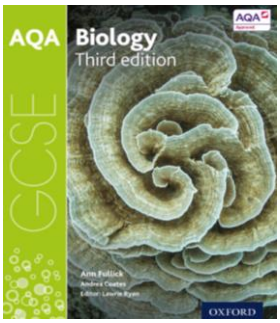
- 4.2.3.1 Plant tissues
- 4.2.3.2 Plant organ systems

Additional support:

Access the appropriate textbook on kerboodle.com, create your own revision notes of the key points of the topic and attempt the summary questions.



Combined science GCSE textbook
Pages 62-69



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Utilise online revision resources to support your class notes, such as…

BBC Bitesize

SENECA
Learn better, faster, free.

gcsepod
education on demand

YouTube

Attempt past paper questions using www.physicsandmathstutor.com and self-mark your answers using the official exam mark schemes.

PMT
resources • tuition • courses

Extension work/extra challenge:

Ask your teacher for extension tasks…

Pack 1 Topic 17 – Carnivores in the Plant World (4.3.3)

Pack 1 Topic 18 – The Oxygen Apocalypse! (4.4)