

Transport in plants: practice questions

8 questions • 24 marks • mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 24

1 Which feature of a root hair cell gives it a large surface area? [1 mark]

- A. ☐ A thin cell wall
- B. ☐ Many mitochondria
- C. ☐ A long, thin projection
- D. ☐ A permanent vacuole

2 Explain two ways in which a root hair cell is adapted to absorb water and mineral ions. (4) [4 marks]

3 Which statement about the xylem is correct? [1 mark]

- A. ☐ It is made of living cells that carry sucrose
- B. ☐ It is made of lignified dead cells that carry water
- C. ☐ It is made of lignified living cells that carry sucrose
- D. ☐ It is made of dead cells that carry sucrose

4 Compare the structure and function of xylem and phloem. (3) [3 marks]

5 Describe how water moves from the soil to the air through a plant. (4)

[4 marks]

6 A plant is short of water. Explain why its stomata close. (2)

[2 marks]

7 Describe translocation and explain why it requires energy. (3)

[3 marks]

8 Explain how the structures of the xylem and the phloem are adapted to their functions in a plant. (6)

[6 marks]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

C C

2. [4]

- has a long thin projection / root hair (1)
- gives a large surface area for absorption (1)
- has many mitochondria (1)
- to release energy by respiration for active transport of mineral ions (1)
- has a thin cell wall (1)
- short distance for water / mineral ions to cross (1)
- cell sap is more concentrated than the soil water (1)
- so water enters by osmosis (1)
- Max 4: award each explanation mark only when linked to its adaptation

3. [1]

B B

4. [3]

- xylem is made of dead cells whereas phloem is made of living cells (1)
- xylem carries water and mineral ions whereas phloem carries sucrose (1)
- xylem walls are lignified whereas phloem cells have sieve plates / companion cells (1) allow phloem needs energy but xylem does not

5. [4]

- water enters the root hair cells (by osmosis) (1)
- water moves up through the xylem (1)
- water evaporates from the (surface of) cells in the leaf (1)
- water vapour diffuses out through the stomata (1)

6. [2]

- guard cells lose water / become limp (1)
- reduces water loss by transpiration / evaporation (1) allow stops the plant drying out

7. [3]

- transport of sucrose (1)
- from the leaves to the parts of the plant that use or store it / to growing regions (1) allow in the phloem
- phloem is made of living cells that use energy from respiration (1)

8. [6]

Level 3 5-6	A detailed explanation covering both tissues, linking structure to function for each, including lignin and dead cells in xylem and living cells using energy in phloem. Scientific terms are used accurately.
Level 2 3-4	Some correct structures are linked to the function of both tissues, or a detailed explanation of one tissue and a limited one of the other.
Level 1 1-2	Simple statements about what xylem and phloem carry, with little or no link to structure.

Indicative content

- xylem carries water and mineral ions from the roots to the rest of the plant
- xylem cells are dead, with no cytoplasm or end walls, forming a continuous hollow tube so water flows easily
- walls are lignified, which strengthens them and stops the tubes from collapsing / supports the plant
- phloem carries sucrose (translocation) around the plant
- phloem is made of living cells, which use energy from respiration to transport sucrose
- sieve plates (holes in the end walls) allow sucrose to move from cell to cell
- companion cells have many mitochondria to release the energy needed