

8 Xylem and phloem – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)		
transport tissues	_____	_____	_____
xylem	_____	_____	_____
phloem	_____	_____	_____
mineral ions	_____	_____	_____
lignin	_____	_____	_____
sucrose	_____	_____	_____
amino acids	_____	_____	_____
vascular bundles	_____	_____	_____
root hair cells	_____	_____	_____
surface area	_____	_____	_____

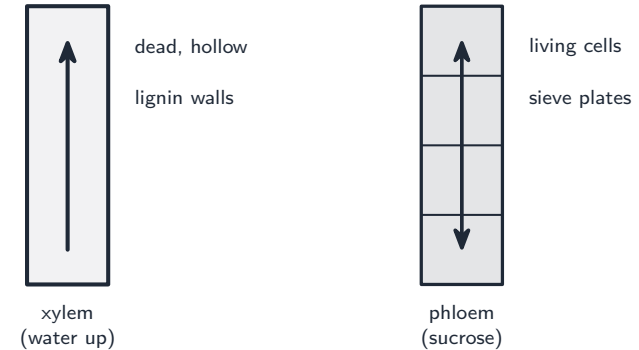
Recall

Plants have two **transport tissues** running through the roots, stem and leaves:
xylem and **phloem**.

New ideas

Read these first, then do the Practice.

■ 1 Xylem and phloem

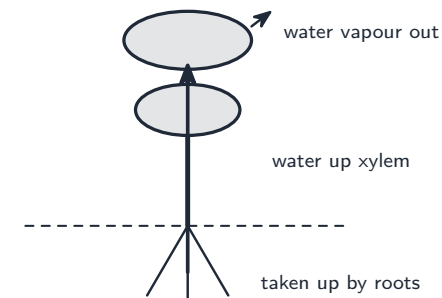


- **xylem** carries water and **mineral ions** **up** from the roots, and supports the plant. Its cells are dead, hollow tubes with walls strengthened by **lignin**.
- **phloem** carries **sucrose** and **amino acids** to wherever they are needed. Its cells are living.

They lie side by side in **vascular bundles**.

■ 2 Water uptake

Water enters through **root hair cells**. Their huge number gives a large **surface area** for fast uptake. The water then travels up:



root hairs → xylem → leaves.

Watch out: **xylem** carries water and minerals **up** only, in *dead* hollow tubes;

phloem carries sucrose and amino acids *both* ways, in *living* cells – keep the two apart. Root hair cells speed uptake by giving a large surface area.

Practice

Try these in order.

8.1 What does xylem carry, and in which direction? [2]

8.2 What does phloem carry? [1]

8.3 Why are xylem walls strengthened with lignin? [1]

8.4 Through which cells does water enter a plant? [1]

8.5 Why do root hairs help the plant take up water quickly? [1]

8.6 Challenge. Give **two** ways the structure of a xylem vessel suits its job of carrying water up the plant. [2]