Translocation in phloem

Student activity • observation and reasoning

YEAR 10 / LESSON 43 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How do dissolved organic substances reach the parts that need them?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, paper models, pencil and ruler

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared Biology / Double Award: 2.53. Phloem transport.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

YEAR 10 / LESSON 43 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Label phloem and xylem on a supplied plant vascular-bundle diagram.

2. Identify sucrose and amino acids as substances transported in phloem; distinguish them from water and mineral ions in xylem.

3. Draw arrows from a photosynthesising leaf to a growing root and shoot. Explain the source and sink in each example.

4. Consider a storage organ supplying a new shoot. Explain why a source need not always be a leaf.

5. Explain that transport can occur in different directions in different phloem tubes; do not describe all translocation as downward.

6. Compare phloem and xylem in a table covering substances, living tissue and routes.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

YEAR 10 / LESSON 43 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Reference and task data

Phloem transports dissolved organic substances between sources and sinks. Sources release substances for transport; sinks use or store them. A plant organ can change role over time. Detailed pressure-flow mechanisms are not needed for this task.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

YEAR 10 / LESSON 43 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Name two phloem solutes.

2. Is all phloem transport downward?

3. Give a source example.

4. Give a sink example.

5. How can a storage organ change role?

6. What principally moves in xylem?