Water uptake with a potometer

Teacher / technician

YEAR 10 / LESSON 42 / BIOLOGY ONLY

Staff preparation and answer guidance. Keep separate from student sheets. Original learning tasks; no supplied numerical example represents class measurements.

Coverage and delivery

Biology only: 2.58B. Environmental factors and water uptake.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, five groups of six

Item	Per pair / setup	Class total
Booklets	1 per learner	30
Complete potometer and supported shoot	1 per group of six	5 plus spare shoots
Guarded low-voltage fan	1 per station	5
Timer / thermometer / ruler	1 set per station	5 sets
Water, tray, absorbent cloth	per station	5 trays; water to apparatus capacity
Eye protection	1 per learner handling apparatus	30

Immediate safety

Staff cut stems and assemble glass tubing before class. Do not force glass into bungs or tubing. Wear eye protection around glass, support apparatus securely, keep electrical equipment and leads away from water, and wipe spills promptly.

Preparation and delivery

Read alongside the student method

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1. Set up five supported potometers for groups of six. Select suitable non-irritant shoots; cut under water and assemble following the apparatus instructions, avoiding air entering the xylem. Staff handle all blades and glass assembly.

2. Fill with water, check seals and pilot the bubble speed. Adjust the observation interval if travel is too short or runs beyond the scale; use one interval consistently and record it.

3. Provide a guarded low-voltage fan and marked distance per station. Keep power supplies dry and ensure leaf surfaces are not touching the fan.

4. Show reservoir reset and reject leaking setups. Record internal capillary radius only if reliably known; otherwise report distance per time, not invented volumes.

Close of lesson

- Staff dismantle and store glass apparatus.
- Switch off fans, dry benches and wash hands after plant handling.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Air movement at a specified fan position and setting.
- Bubble displacement in a fixed time.
- Multiply displacement by capillary cross-sectional area πr^2.
- The shoot and apparatus need time to respond.
- It helps identify drift over time.
- Leaks, storage/growth, stomatal changes and unequal shoots can affect uptake.

References and provenance

Pearson Biology specification

SAPS: potometer investigation

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.