Testing requirements for starch formation

Teacher / technician

YEAR 10 / LESSON 30 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Comparative starch evidence from prepared leaves. Heated-solvent and absorber stages are staff-only; no laboratory trial is claimed.

Coverage and delivery

Shared Biology / Double Award: 2.23. Starch, light, carbon dioxide and chlorophyll.

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

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklets / eye protection	1 per learner	30 of each
Prepared leaf treatment sets	shared demonstrations for three comparisons	matched sets plus spares
White tiles / forceps / iodine droppers	1 per pair	15 sets
Dilute iodine	small drops per cooled leaf	about 30 cm^3 class supply
Hot-water / ethanol stations	staff only; stable racks and holders	1–2 supervised stations
Ethanol / waste container	only enough to cover leaves in labelled tubes	pilot quantity; capped stock and separate waste

Immediate safety

Wear eye protection. Staff alone handle hot water, hot ethanol and carbon dioxide absorber. Ethanol is highly flammable: all ignition sources are removed. Pupils handle only cooled, rinsed leaves and dilute iodine. Report splashes and avoid plant sap contact.

Preparation and delivery

Read alongside the student method

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1. Prepare healthy destarched plants, confirming an initial no-starch check on a spare leaf. Record dark pretreatment and subsequent illumination durations; pilot with the species and season.

2. Use opaque covers on both sides of part of a leaf and map a variegated leaf before treatment. For the CO_2 comparison use a matched enclosed plant without absorber; staff use the school-approved absorber arrangement, preventing contact with plants or pupils.

3. Use the linked standard starch-test technique: staff briefly soften leaves in hot water, then decolourise in ethanol in an indirect electrically heated water bath. Remove all flames and ignition sources from the area; do not heat a sealed tube.

4. Rinse leaves with water and cool before pupils add iodine. Include reference controls and preserve genuine unsuccessful outcomes as limitations. Follow current supplier information and the school risk assessment for absorber, ethanol and iodine.

Close of lesson

- Staff collect ethanol separately in a labelled solvent-waste container away from ignition sources.
- Collect leaves and iodine residues as directed; wash hands and clean tiles.

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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- To reduce stored starch that could otherwise be mistaken for starch made during the treatment.
- To make the iodine colour easier to see.
- Ethanol is highly flammable; an indirect water bath reduces ignition risk but still requires careful hot-liquid handling.
- Covered and uncovered regions under otherwise comparable conditions, with an adequate light-exclusion treatment.
- Their original pigmentation is removed, so the pattern must be retained for comparison.
- The absorber or enclosure may also affect humidity or temperature; leaks, residual CO_2 and plant differences can confound results.

References and provenance

Pearson Biology specification

Practical Biology: leaf starch technique

Practical Biology: photosynthesis conditions

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.