



**READ THESE INSTRUCTIONS FIRST**

These Instructions give details of the apparatus required by each candidate for each experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the Biology Teacher to test the apparatus appropriately. **Testing must be done out of sight of all candidates. No access to the Question Paper is permitted in advance of the examination.** Centres are reminded that candidates are expected to follow the instructions on the Question Paper and record all their results. They will not be penalised if these results are not what they expect.

The Supervisor should make sure the Supervisor's Report is fully completed and a copy is enclosed with each packet of scripts.

It is assumed that the ordinary apparatus of a science laboratory will be available, including a supply of purified water (distilled or deionised).

If arrangements are made for different sessions for different groups of candidates, care must be taken to ensure that the different groups of candidates are effectively isolated so that **no information passes between them.**

**All specimens should carry only the code letters and numbers as indicated and their identity should not be revealed to the candidates.**

Supervisors should ensure that all specimens have the correct identity attached to the specimen and that these are **not** removed during the examination.

If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Supervisor's Report.

Supervisors are advised to remind candidates that all substances in the examination should be treated with caution. Pipette fillers and eye protection should be used where necessary.

In accordance with COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

The following codes are used where relevant.

**C** = corrosive substance

**F** = highly flammable substance

**H** = harmful or irritating substance

**O** = oxidising substance

**T** = toxic substance

**N** = harmful to the environment

Centres are reminded that they are **not** permitted to open the Question Paper envelopes before the examination.

If there are any difficulties with any aspect of setting up this practical examination that the Centre is not able to resolve, it is essential for Centres to contact the Product Manager as soon as possible by **e-mail** to [info@cie.org.uk](mailto:info@cie.org.uk), by **fax** to +44 1223 553558 or by **phone** to +44 1223 553554.

**Question 1**

Each candidate should be provided with:

- (i) three specimen tubes or other small, flat bottomed container suitable to hold 40 mm depth of liquid (volume between 20 cm<sup>3</sup> (206 mm × 70 mm) – 30 cm<sup>3</sup> (280 mm × 75 mm) of liquid)
- (ii) 100 cm<sup>3</sup> 2% hydrogen peroxide, with a 10 cm<sup>3</sup> syringe [without a needle], in a beaker, labelled **hydrogen peroxide**
- (iii) supply of leaves sufficient to cut 3 pieces 10 mm × 10 mm and 3 pieces 15 mm × 15 mm

Any soft, green, fresh leaves from a dicotyledon, e.g. cabbage (*Brassica oleracea*), Chinese leaf (*Brassica rapa*, subspecies *pekinensis*), Dead nettle (*Lamium* species). Heavy leaves with thick waxy cuticles and leaves from a monocotyledon are **not** suitable. The species given to the candidates should be identified in the Supervisor's Report.

- (iv) scissors (for cutting leaves)
- (v) ruler (with mm scale)
- (vi) three × 10 mm length of 1 mm diameter lead-free solder wire for weighting leaf sections in a container, labelled **wire**

Each piece of wire should have a maximum mass of 0.5 g.

- (vii) means of labelling the specimen tubes, e.g. water-proof marker pen or adhesive labels
- (viii) view of a clock or timer that allows the candidate to time one second accurately
- (ix) forceps (for handling pieces of leaf)
- (x) empty container, labelled **waste**
- (xi) access to paper towels (in case of spillages)
- (xii) eye protection

**Solution preparation***2% hydrogen peroxide*

Dilute stock solution (20 vol or 6%) using distilled or deionised water. Add 667 cm<sup>3</sup> distilled water to 333 cm<sup>3</sup> stock (6%) hydrogen peroxide to make 1 dm<sup>3</sup>. This is sufficient for 10 candidates.

Stock solution should be newly bought and stored in a cool, dark place. The diluted solution can be made the day before the examination and stored in a cool, dark place. It should be allowed to reach room temperature before the examination.

**Before the examination**, the Supervisor should carry out trials to determine the best type of leaf to use.

Make 2% hydrogen peroxide and add a 40 mm depth to a specimen tube. Cut a piece of leaf 10 mm × 10 mm and fold a 1 cm length of lead-free solder around one edge of this piece of leaf. Put the piece of leaf into the hydrogen peroxide and push it to the bottom of the specimen tube using forceps.

Record the time taken for the leaf piece to rise to the surface. This should be between 60–120 seconds. If the time is too short or too long, try another type of leaf.

The Supervisor (**not** the Invigilator) should carry out the practical aspects of **Question 1** and record their results in the space in the Supervisor's Report. This must be done during the examination, using the same apparatus as the candidates but **out of sight** of the candidates.

## Question 2

No additional materials required.





This form should be completed and returned to CIE with the scripts.

### SUPERVISOR'S REPORT ON PRACTICAL BIOLOGY

The Supervisor should provide the following information.

- 1 Was any difficulty experienced in providing the necessary materials? If so, give brief details.

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 .....  
 .....

- 2 Give details of any difficulties experienced by particular candidates, giving names and candidate numbers. Reference should be made to:

(a) difficulties with specimens or materials;

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(b) accidents to apparatus or materials;

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(c) assistance provided in the case of colour-blindness;

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(d) any other information that is likely to assist the Examiner, especially if this cannot be discovered from the scripts.

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Other cases of individual hardship, e.g. illness or disability, should be reported direct to CIE on the normal 'Special Consideration Form' as detailed in the Handbook for Centres.

- 3 During the examination, the Supervisor should, **out of sight of the candidates**, carry out the practical aspects of **Question 1** using the same apparatus and reagents as the candidates. Results should be recorded in the space on page 8.

The Invigilator should **not** carry out **Question 1**.

Species of plant used for **Question 1**. .....

- 4 A plan of work benches, giving details of the candidate numbers of the places occupied by the candidates for each session must be enclosed with the scripts.

**Declaration** (to be signed by the Principal or the Examinations Officer)

The preparation of this practical has been carried out so as to maintain fully the security of the examination.

Signed .....

Name (IN BLOCK CAPITALS) .....

Centre number .....

Centre name .....

If scripts are required to be dispatched in more than one packet, it is essential that a copy of the Supervisor's Report and the appropriate seating plan(s) are inside **each packet**.

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