



Cambridge International AS & A Level

BIOLOGY

9700/03

Paper 3 Advanced Practical Skills

For examination from 2020

SPECIMEN CONFIDENTIAL INSTRUCTIONS



This document gives details of how to prepare for and administer the practical exam.

The information in this document and the identity of any materials supplied by Cambridge International are confidential and must NOT reach candidates either directly or indirectly.

The supervisor must complete the report at the end of this document and return it with the scripts.

INSTRUCTIONS

- If you have any queries regarding these confidential instructions, contact Cambridge International stating the centre number, the syllabus and component number and the nature of the query.
email info@cambridgeinternational.org
phone +44 1223 553554

This document has **8** pages. Blank pages are indicated.

General information about practical exams

Centres must follow the guidance on science practical exams given in the *Cambridge Handbook*.

Safety

Supervisors must follow national and local regulations relating to safety and first aid.

Only those procedures described in the question paper should be attempted.

Supervisors must inform candidates that materials and apparatus used in the exam should be treated with caution. Suitable eye protection should be used where necessary.

The following hazard codes are used in these confidential instructions, where relevant:

C	corrosive	MH	moderate hazard
HH	health hazard	T	acutely toxic
F	flammable	O	oxidising
N	hazardous to the aquatic environment		

Hazard data sheets relating to substances used in this exam should be available from your chemical supplier.

Before the exam

- The packets containing the question papers must **not** be opened before the exam.
- It is assumed that standard school laboratory facilities, as indicated in the *Guide to Planning Practical Science*, will be available.
- Spare materials and apparatus for the tasks set must be available for candidates, if required.

During the exam

- It must be made clear to candidates at the start of the exam that they may request spare materials and apparatus for the tasks set.
- Where specified, the supervisor **must** perform the experiments and record the results as instructed. This must be done **out of sight** of the candidates, using the same materials and apparatus as the candidates.
- Any assistance provided to candidates must be recorded in the supervisor's report.
- If any materials or apparatus need to be replaced, for example, in the event of breakage or loss, this must be recorded in the supervisor's report.

After the exam

- The supervisor must complete a report for each practical session held and each laboratory used.
- Each packet of scripts returned to Cambridge International must contain the following items:
 - the scripts of the candidates specified on the bar code label provided
 - the supervisor's results relevant to these candidates
 - the supervisor's reports relevant to these candidates
 - seating plans for each practical session, referring to each candidate by candidate number
 - the attendance register.

Specific information for this practical exam

During the exam, the supervisor or other competent biologist (**not** the invigilator) should obtain the results specified on the supervisor's report by following the relevant steps in the question paper. The results should be recorded in the space provided on the supervisor's report.

Organisation of the exam

- Half the candidates should start on Question 1 and the other candidates should start on Question 2.
- For Question 2, each candidate must have uninterrupted use of a microscope for at least 55 minutes.

Materials to be supplied by Cambridge International

- Slide **J1** (TS dicotyledonous root, e.g. *Ranunculus* sp.)

On receipt of the slides, check that they are labelled **J1** and that no slides are broken. The slides should not be viewed in advance of the exam. The material on the slides is confidential and must not be disclosed to candidates.

The number of slides supplied by Cambridge International will be equal to half the candidate entry.

Return of slides to Cambridge International

Immediately after the exam, the slides must be:

- returned to Cambridge International in the boxes in which they were received, using the self-adhesive label supplied. The slides must **not** be included in the packet of scripts.

or

- purchased using the order form enclosed with the slides, which should be completed and returned to Cambridge International. The order form must **not** be included in the packet of scripts. Slides and boxes will be charged at the rate of £3.25 per slide plus £1 per box.

If the slides are not returned or purchased by the deadline stated on the order form, the charge will be £3.75 per slide plus £1 per box.

Materials and apparatus for Question 1

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
7% yeast cell suspension in a beaker or container, labelled Y , provided at a temperature of 35–45 °C (see Preparation of materials) This volume should not include any froth.	at least 100 cm ³	
10 cm ³ syringe	1	
Beaker or container with 300 cm ³ of tap water at 60–65 °C, labelled Hot The Supervisor may use a thermostatically controlled water-bath to provide the water to candidates.	1	
Beaker or container with 300 cm ³ of tap water at 20–25 °C, labelled Cold Iced water may be provided if room temperature is above 25 °C.	1	
Test-tube, small, capacity 20–30 cm ³	1	
Test-tube, large, capacity 40–55 cm ³	1	
Test-tube rack to hold large test-tube	1	
Clear container to hold small test-tube	1	
Delivery tube and bung to fit large test-tube (see Preparation of materials)	1	
Glass rod	1	
Beaker, capacity approximately 400 cm ³ , labelled W The beaker should be suitable for use as a water-bath and be able to hold the beaker or container labelled Y so that it cannot tip over.	1	
Thermometer, –10 °C to +110 °C	1	
Container with approximately 200 cm ³ tap water, labelled For washing	1	
Container, capacity approximately 200 cm ³ , labelled For waste	2	
Paper towels	8	
Glass marker pen, permanent	1	
Stop-clock or timer showing seconds	1	
Suitable eye protection	1	

Preparation of materials

- **Y**, 7% yeast cell suspension

Y should be prepared one hour before the candidates start **Question 1**. In a large container, add 7 g of dried yeast (for baking) to 40 cm³ of warm distilled water. Stir and make up to 100 cm³ with warm distilled water. This should be kept for approximately 30 minutes at a temperature of 35 °C to 40 °C.

Approximately 15 minutes before candidates start **Question 1**, sprinkle 20 g of glucose over the surface of the suspension and stir thoroughly. Keep at a temperature of 35 °C to 40 °C.

It is suggested that preparation of the yeast cell suspension should be tried before the examination as some yeast will require more time, after the glucose is added, to become active (with froth on the top).

Before putting the 100 cm³ of **Y** into the beaker for the candidates, it is suggested that the yeast suspension is poured into a second beaker leaving the froth behind.

- Delivery tube and bung

The delivery tube and bung should be prepared so that:

- the seal between the bung and delivery tube is airtight
- the bung fits into the large test-tube to a depth of at least 0.5 cm and forms an airtight seal with the large test-tube
- the delivery tube has a bend, as shown in Fig. 1.1, so that gas can be bubbled into a small test-tube
- the end of the delivery tube must be long enough to allow it to be inserted into a small test-tube to at least half the depth of the small test-tube.

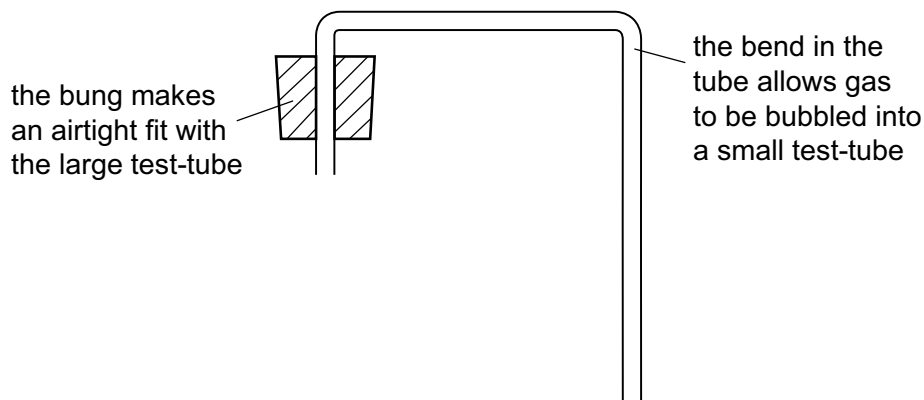


Fig. 1.1

Materials and apparatus for Question 2

Each candidate will need:

materials and apparatus for each candidate	quantity	✓
Microscope with: <ul style="list-style-type: none"> • an eyepiece lens, $\times 10$ magnification • a low-power objective lens, $\times 10$ magnification • a high-power objective lens, $\times 40$ magnification 	1 between 2	
Slide J1 (TS dicotyledonous root, e.g. <i>Ranunculus sp.</i>)	1 between 2	
Ruler, marked in mm	1	

Preparation of materials

- Microscope

Any lenses that are **not** $\times 10$ or $\times 40$ should be removed or replaced.

For each candidate:

- the microscope must be set up on low power
- the slide must **not** be on the stage of the microscope.

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Supervisor's report

Syllabus and component number

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Centre number

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Centre name

Time of the practical session

Laboratory name/number

Give details of any difficulties experienced by the centre or by candidates (include the relevant candidate names and candidate numbers).

You must include:

- any difficulties experienced by the centre in the preparation of materials
- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
- any specific assistance given to candidates.

Temperature of exam room °C

Results for **Question 1(a)(v)**

Declaration

- 1 Each packet that I am returning to Cambridge International contains the following items:
 - the scripts of the candidates specified on the bar code label provided
 - the supervisor's results relevant to these candidates
 - the supervisor's reports relevant to these candidates
 - seating plans for each practical session, referring to each candidate by candidate number
 - the attendance register.
- 2 Where the practical exam has taken place in more than one practical session, I have clearly labelled the supervisor's results, supervisor's reports and seating plans with the time and laboratory name/number for each practical session.
- 3 I have included details of difficulties relating to each practical session experienced by the centre or by candidates.
- 4 I have reported any other adverse circumstances affecting candidates, e.g. illness, bereavement or temporary injury, directly to Cambridge International on a *special consideration form*.

Signed (supervisor)

Name (in block capitals)