Cambridge Assessment International Education

# Cambridge IGCSE™

**CO-ORDINATED SCIENCES** **0654/52**

Paper 5 Practical Test **February/March 2025**

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



DC (SL) 343249/4


**[Turn over**

# 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 (**not** the invigilator) must do the experiments in Questions 1, 2, 3, 5 and 6 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

**For Question 1**

Each candidate will require:

| hazard | materials and apparatus | quantity per candidate |
|---|---|---|
| | boiling tube (approximately 150 mm × 25 mm) with a horizontal line marked at 3 cm below the top, supplied in a rack (see note 1.1) | 1 |
| | test-tube (approximately 125 mm × 16 mm) with a line marked at 3 cm from the top, supplied in a rack (see note 1.1) | 1 |
| | stop-clock | 1 |
| | stirring thermometer, –10 °C to +110 °C, with 1 °C graduations | 1 |
| | access to hot water of about 80 °C (see note 1.2) | 100 $cm^3$ |
| | paper towels | 5 |

**Notes**

**1.1** If a rack is not available tubes can be clamped vertically with a boss, clamp and stand.

**1.2** The temperature of the hot water supply needs to be maintained throughout question 1.

Candidates should be warned of the dangers of burns or scalds when using very hot water.

**For Question 2**

Each candidate will require:

| hazard | materials and apparatus | quantity per candidate |
|---|---|---|
| | leaf of 4–6 cm length labelled **leaf A** supplied on a white tile (see note 2.1) | 1 |
| | leaf of the same species as leaf **A** supplied on a white tile and labelled **leaf B** (see notes 2.1 and 2.2) | 1 |
| **[MH][N]** | Iodine solution with a dropper, labelled **iodine solution** | 1 $cm^3$ |
| | forceps | 1 |
| | paper towels | 5 |

**Notes**

**2.1** Leaf **A** and leaf **B** must be non-variegated (green all over) and have the chlorophyll removed.

This can be done by dipping in boiling water, heating in ethanol and then rinsing with cold water.

**2.2** Leaf **B** must be de-starched.

This can be achieved by placing the plant in the dark for 2 days.

**For Question 3**

Each candidate will require the following materials and apparatus. Labels do not need to include concentrations.

| hazard | materials and apparatus | quantity per candidate |
|---|---|---|
| | calcium metal in any sealed container labelled **J** | 3 granules |
| | calcium carbonate powder labelled **K** | 4 spatula loads |
| **[MH]** | 1.0 mol $dm^{-3}$ calcium chloride labelled **L** | 15 $cm^3$ |
| **[low haz]** | access to 0.1 mol $dm^{-3}$ barium nitrate in a bottle with a dropper or supplied with a dropping pipette, labelled **barium nitrate** (see note 3.1) | |
| | access to 0.05 mol $dm^{-3}$ silver nitrate in a bottle with a dropper or supplied with a dropping pipette, labelled **silver nitrate** | |
| **[C]** | access to 1.0 mol $dm^{-3}$ nitric acid in a bottle with a dropper or supplied with a dropping pipette, labelled **nitric acid** | |
| **[C]** | access to 1.0 mol $dm^{-3}$ sodium hydroxide in a bottle with a dropper or supplied with a dropping pipette, labelled **sodium hydroxide** | |
| | boiling tubes of carbon dioxide gas stoppered labelled **carbon dioxide** | 2 |
| | boiling tubes (see note 3.3) | 2 |
| | test-tubes (see note 3.2) | 4 |
| | hard glass test-tube (see note 3.2) | 1 |
| | test-tube holder to hold the hard glass test-tube for heating | 1 |
| | 10 $cm^3$ measuring cylinder | 1 |
| | spatula | 1 |
| | wooden splints | 3 |
| | apparatus that the centre uses for testing for carbon dioxide | 1 |
| | Bunsen burner and a means to light it | 1 |
| | heatproof mat | 1 |
| | pieces of red litmus paper | 2 |
| | glass stirring rod | 1 |
| | paper towels | 2 |
| | access to distilled or deionised water | |

**Notes**

**3.1** This may be aqueous barium chloride labelled as **barium nitrate**.

**3.2** The test-tubes and hard glass test-tube should each be approximately 125 mm × 16 mm and be supported in a test-tube rack or appropriately sized beaker.

**3.3** The boiling tubes should be approximately 150 mm × 25 mm and be supported in a test-tube rack or appropriately sized beaker.

**Question 4**

No chemicals or apparatus are required for this question.

**For Question 5**

Each candidate will require:

| hazard | materials and apparatus | quantity per candidate |
|---|---|---|
| | 2-litre plastic soft drinks bottle with lid approximately 30 cm tall (see Note 5.1) | 1 |
| | 30 cm ruler graduated in mm | 1 |
| | access to tap water (see Note 5.2) | |
| | protractor | 1 |
| | paper towels for spillages | |

**Notes**

**5.1** The label should be removed from the bottle.

The bottle should have parallel flat sides / as uniform a diameter as possible. The bottle must contain a 6 cm depth of water at the start of the experiment. It is not necessary for the bottom of the bottle to be circular or flat.

**5.2** There should be sufficient water for candidates to fill the bottle.

**Action at changeover**

Pour water into the plastic bottle to a depth of 6 cm and ensure each candidate has access to sufficient tap water and paper towels.

**For Question 6**

Each candidate will require:

| hazard | materials and apparatus | quantity per candidate |
|---|---|---|
| | access to a balance capable of measuring to the nearest 0.1 g | |
| | piece of waterproof modelling clay shaped into a rough sphere e.g. Plasticine approximate mass 50 g | 1 |
| | 30 cm ruler graduated in 1 millimetre intervals | 1 |
| | 100 $cm^3$ measuring cylinder | 1 |
| | access to tap water | |
| | paper towels | 2 |

**Action at changeover**

Shape the modelling clay into a rough sphere.

**BLANK PAGE**

## Supervisor's report

Syllabus and component number | | | | | / | | |

Centre number | | | | | |

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.

**Declaration**

1 Each packet that I am returning to Cambridge International contains all of 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) .....