

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 and 3 and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

Apparatus and chemicals for Question 1

Each candidate will require:

- (i) 150 cm³ 1.5 mol dm⁻³ hydrochloric acid labelled **dilute hydrochloric acid**
- [F] (ii) 25 × 2 cm lengths of magnesium ribbon labelled **magnesium ribbon**
- (iii) 25 cm³ or 50 cm³ measuring cylinder
- (iv) thermometer, -10 °C to +110 °C with 1 °C graduations
- (v) 2 large test-tubes/boiling tubes, approximately 150 mm × 25 mm and means to support them
- (vi) wooden splint and means to light it
- (vii) apparatus used to test for carbon dioxide
- (viii) 2 red litmus papers
- (ix) universal indicator solution with dropper supplied
- (x) access to distilled/deionised water
- (xi) paper towels.

Action at changeover

Refresh supplies of unused magnesium ribbon, dilute hydrochloric acid, litmus paper and wooden splint.

Provide fresh test-tubes.

Top up deionised water if necessary.

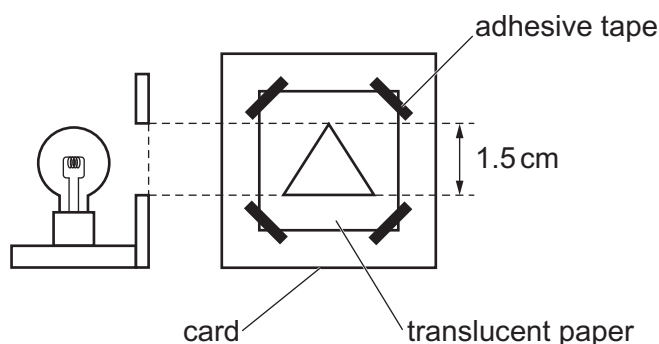
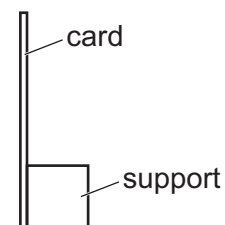
Apparatus for Question 2

Each candidate will require:

- (i) converging lens of focal length between 14.0 cm and 16.0 cm with a suitable holder
- (ii) metre rule with a mm scale
- (iii) illuminated object consisting of rigid card with a triangular hole of height 1.5 cm (see Fig. 2.1). The hole is to be covered with a thin translucent paper (e.g. tracing paper) secured with adhesive tape
- (iv) plain white screen. A sheet of stiff white card approximately 15 cm × 15 cm, fixed to a wooden support, is suitable (see Fig. 2.2)
- (v) 50 cm or 30 cm ruler, graduated in mm, candidates may use their own
- (vi) 12 V, 24 W (or greater) lamp and holder, 0–12 V power supply, 2 connecting leads.

Notes

1. The lamp used for the illuminated object should be low voltage, 24 W or greater.
2. The lamp filament, the centre of the hole which forms the object and the centre of the lens in its holder, must all be the same height above the bench.
3. The apparatus should be situated away from direct sunlight.

**Fig. 2.1****Fig. 2.2****Action at changeover**

Check that the apparatus is intact and that the lamp is working.

Replace or re-cover the screen if it has been marked.

Apparatus for Question 3

Each candidate will require:

- (i) 2 identical steel springs. See note 1
- (ii) 2 clamps, two bosses and two stands. See notes 2 and 3
- (iii) metre rule with mm scale. See note 2
- (iv) two 100g masses and a 100g mass hanger or masses of 100g, 200g and 300g, with labels. See note 4
- (v) set-square.

Notes

1. An expendable steel spring is suitable, for example, a 2 cm long spring with diameter 15 mm (see www.philipharris.co.uk code B8G87194). The spring must be able to take a load of at least 5 N without overstretching. Spare springs should be available.
2. The metre rule is to be held vertically, using a clamp, with the 100 cm end in contact with the bench.
3. The apparatus is to be set up for the candidates as shown in Fig. 3.1. The clamp holding the top spring is to be sufficiently high above the laboratory bench that, when both springs are attached in series (see Fig. 3.2) and the 3 N load is hung on the springs, the bottom of the load is about 10 cm above the surface of the bench. Only one of the springs is to be attached.

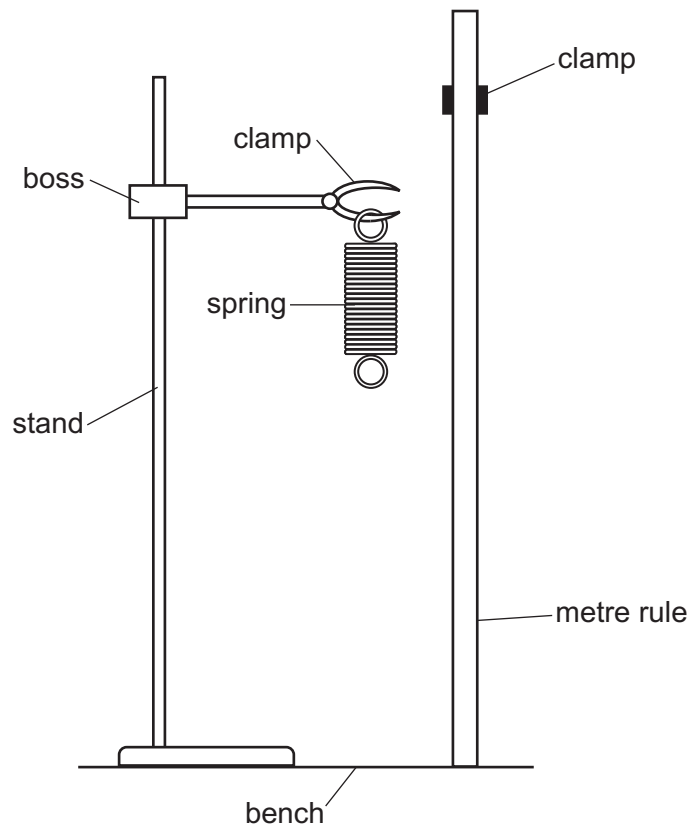


Fig. 3.1

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**Fig. 3.2**

4. Two 100 g slotted masses with a 100 g mass hanger, each labelled 1.0 N, are ideal. If these are not available, a light hook must be provided so that the masses, labelled 1.0 N, 2.0 N and 3.0 N, can be hung from the spring.

Action at changeover

Check that the apparatus is set up as shown in Fig. 3.1.

Replace any springs if overstretched.

Apparatus for Question 4

No apparatus is required for this question.

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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.

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)