



### Instructions for preparing apparatus

These instructions detail the apparatus, reagents and specimens required by each candidate for the experiment in this paper. A summary of the questions that will be presented to the candidates is included, where appropriate, to allow the teacher to test the apparatus appropriately. **No access is permitted to the question paper in advance of the examination session.**

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.**

### For Question 1

Each candidate will require:

- (i) three separate groups of seedlings, labelled **A**, **B** and **C**. Cress seeds are ideal for this experiment. They should be germinated on damp cotton wool in a petri dish. Each candidate should have a group of approximately 10 seedlings. If the entry from a Centre is large the cotton wool can be separated into smaller pieces before putting in the dishes (up to four pieces per dish). This allows several samples of seedlings to be grown in the same petri dish. The groups of seedlings on their pieces of cotton wool can then be separated and presented to the candidates in a new petri dish or on a white tile. They should be labeled **A**, **B** or **C** according to the box of their origin. The seeds should be germinated a few days before the experiment (depending on the ambient temperature) so that seedlings are about 2-3 cms high in box **B**. It is important that this is trialled in local conditions.

The seedlings should be germinated in 3 boxes. The boxes should be 20-30 cms high.

- box **A** completely closed to produce seedlings that are tall and spindly
- box **B** with no lid and not too deep to produce seedlings of normal healthy growth
- box **C** with one side missing to produce seedlings that exhibit phototropism

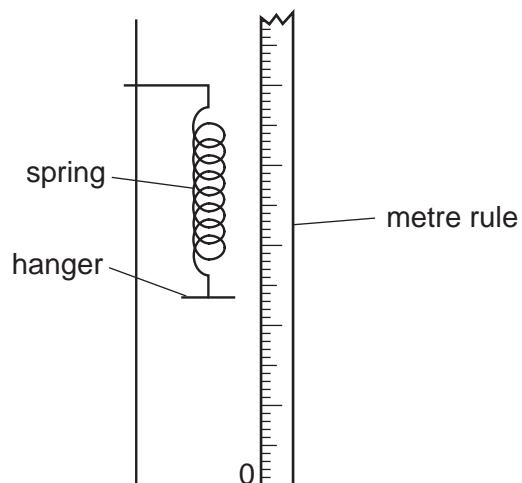
- (ii) a ruler calibrated in mm.

**For Question 2**

Each candidate will require:

- (i) a spring of unstretched length about 40 mm, such that a mass of 100 g stretches it about 40 mm ;
- (ii) a mass hanger for carrying the masses ;
- (iii) access to a selection of masses to make 150, 200, 250, 300 g ;
- (iv) a stand and clamp with suitable fixing point for the spring ;
- (v) a metre rule ;
- (vi) a second clamp to hold the metre rule vertical ;
- (vii) a stopwatch capable of measuring to 0.01 s .

Candidates will be required to set up the apparatus as shown in Fig. 2.1.



**Fig 2.1**

**For Question 3**

*Each candidate will require:*

- (i) 6 test-tubes 125 x 15 mm. If fewer are provided, candidates will be required to wash and reuse.
- (ii) a test-tube holder ;
- (iii) a Bunsen burner ;
- (iv) access to aqueous barium chloride ;
- (v) dilute hydrochloric acid ;
- (vi) a small piece of magnesium ribbon ;
- (vii) a spill ;
- (viii) about 0.5g of solid sodium carbonate, labelled as such ;
- (ix) access to a supply of aqueous sodium hydroxide and aqueous ammonia, concentration about  $1 \text{ mol dm}^{-3}$  ;
- (x) a  $50 \text{ cm}^3$  measuring cylinder ;
- (xi) about  $15 \text{ cm}^3$  of a solution containing about  $16 \text{ g dm}^{-3}$  of iron(III) chloride, labelled "solution **B**." ;
- (xii) about 3g of solid sodium hydrogensulphate, labelled "solid **A**" .

Spare materials and equipment should be available and can be provided without penalty. **Candidates should be made aware of this.**

*Information required from the Supervisor:*

**The Supervisor is asked to carry out the experiments and to enter the results on a spare copy of the examination paper, clearly marked 'Supervisor's Results' and showing the Centre number. This should be returned with the scripts. Failure to do so may cause the candidates to be penalised.**







This form must be completed and returned in the envelope with the scripts together with the seating plan and the Supervisor's Results mentioned on page 4.

October/November 2008

General

The Supervisor is invited to give details of any difficulties experienced by particular candidates giving their names and candidate numbers. These should include reference to:

- (a) difficulties due to faulty apparatus;
- (b) accidents to apparatus or materials;
- (c) physical handicaps, e.g. short sight, colour blindness;
- (d) any other information that is likely to assist the Examiner, especially if this cannot be discovered in the scripts;
- (e) any help given to a candidate.

The Supervisor is asked to supply the following information:

Plan of work benches, giving details by candidate numbers of the places occupied by the candidates for each session and a copy of the 'Supervisor's Results'.

NAME OF CENTRE .....

SIGNED .....  
Supervisor

CENTRE NUMBER .....

DECLARATION (to be signed by the Principal)

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

NAME .....  
(in block capitals)

SIGNED ..... (Principal)



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