



Rewarding Learning

General Certificate of Secondary Education

Physics

Practical Skills Assessment

Unit 3

Booklet B

Foundation Tier

[GPY32]

Assessment

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives

Below are the assessment objectives for GCSE Physics

Candidates must:

- AO1** Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures;
- AO2** Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques and procedures; and
- AO3** Analyse information and ideas to interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate. Candidates can be awarded full marks for an answer if they have not shown a method. The advice to show clearly is to allow partial credit to be awarded.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate. If the starting point for a response is clearly incorrect Physics then award 0.

Marking Calculations

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

Types of mark schemes

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

1 (a) (i)	(Vertical) height of the stairs/step height (no. of steps)	m or metres
	Mass or weight of student	kg or kilograms or N or newtons
	Time to run/walk up the stairs	s or seconds

The unit for mass and weight must be consistent
i.e. mass in kg and weight in N [6]

(ii) Metre rule or stopclock or bathroom scales
Any two [2]

(iii) $\frac{\text{weight} \times \text{height of stairs}}{\text{time taken}}$ $\frac{\text{mass} \times \text{acc due to gravity} \times \text{height of stairs}}{\text{time taken}}$

Sight of $\frac{mgh}{t}$ award 2 marks $\frac{Wh}{t}$ or $\frac{\text{work done}}{\text{time taken}}$ award 1 mark only [2]

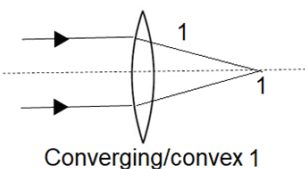
(iv) 350 joules [1]
every second or per second [1] [2]

(v) Increased personal power [1]
More work done [1] [2]

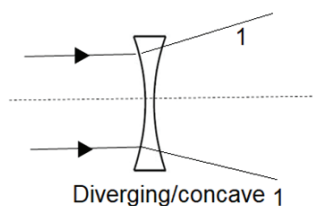
(vi) Repeat a number of times [1]
Take an average of the results [1] [2]

(b) There is no relationship between the mass and the personal power [1]
no correlation [1] 17

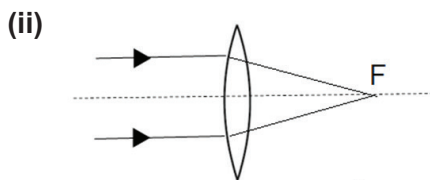
2 (a) (i) Convergent rays
Meet at a point on Pr. Axis
Converging/Convex lens



Divergent rays
Diverging/Concave lens



[5]



[1]

(iii) Focal length

[1]

(b) Indicative content

Apparatus *lens, screen and metre rule (3 points)*

Procedure *move lens or screen until sharp image on screen (2 points)*

Measurement *distance from lens to screen (1 point)*

1 mark per item max of 3 marks

Sharp is required

AVAILABLE
MARKS

Response	Mark
Candidates describe in detail using good spelling, punctuation and grammar 5 or more points shown above. The form and style are of a high standard and specialist terms are used appropriately at all times.	[5]–[6]
Candidates describe in detail using good spelling, punctuation and grammar 3 or 4 points shown above. The form and style are of a high standard and specialist terms are used appropriately at all times.	[3]–[4]
Candidates make some reference to 1 or 2 of the main points shown above using satisfactory spelling, punctuation and grammar. The form and style are of a satisfactory standard and they have made some reference to specialist terms.	[1]–[2]
Response not worthy of credit	[0]

5 points award 6 marks, 3 or 4 points award 4 marks, [6]
1 or 2 points award 2 marks

(c) (i) Student 5 [1]

(ii) 10cm [1]

15

3 (a) (i) Friction [1]

(ii) Length/width of the card [1]

(iii) Time (between gates) [1]

(iv) Average values 0.13, **0.25, 0.38, 0.47, 0.64** [2]
[$\frac{1}{2}$] each, round up

(v) Scale – at least half of x-axis used [1]
label for x-axis [1]
Points plotted – each point plotted correctly ([$\frac{1}{2}$] each round up) [3]
Straight line through (0,0) [1] [6]

(vi) Graph is a straight line [1]
passing through (0,0) or through the origin [1] [2]

(b) Acceleration [1]

Constant speed [2]

Deceleration [1] [4]

17

- 4 (a) (i) Length [1]
(ii) Resistance [1]
(iii) Material/area of cross section or diameter [2]
(iv) A switch [1]
Only closed when a reading is taken [1] [2]
(v) Circuit to show:
Switch in series [1]
Ammeter in series [1]
Voltmeter in parallel with resistance wire [1] [3]
Correct symbols required otherwise penalty of [-1]
(vi) Five resistance values correctly calculated [2]
Two or three resistance values correctly calculated [1]

Length/cm	10	20	30	40	50
Voltage/V	3.0	3.0	3.0	3.0	3.0
Current/A	2.0	1.0	0.7	0.5	0.4
Resistance/ Ω	1.5	3.0	4.3	6.0	7.5

- (vii) Axes: R/ Ω Y axis label [1]
Scale to cover at least half along each axis [1]
5 points correctly plotted (to within 1 small square) [3] [5]
($\frac{1}{2}$ each round up)
(viii) Straight line of best fit passing through 0,0 [1]
(ix) Gradient = $\frac{6}{40}$ [1]
= 0.15 ± 0.02 [1] [2]
(x) Unit = Ω/cm [1]
(xi) Gradient = K [1]

Total

**AVAILABLE
MARKS**

21

70