



**General Certificate of Secondary Education
2024**

GCSE Physics

Unit 1
Foundation Tier

[GPY11]

FRIDAY 7 JUNE, AFTERNOON

**MARK
SCHEME**

General Marking Instructions and Mark Grids

Introduction

Mark schemes are intended to ensure that the GCSE examination is 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 that they should apply in allocating marks to candidates' responses. The mark schemes should be read in conjunction with these marking instructions.

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, the examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners must be positive in their marking, giving appropriate credit for description, explanation and analysis, using knowledge and understanding and for the appropriate use of evidence and reasoned argument to express and evaluate personal responses, informed insights and differing viewpoints. Examiners should make use of the whole of the available mark range of 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.

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.

Types of mark scheme

Mark schemes for 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) Constant speed	[1]		
	(ii) Speed = distance/time = 100/20 = 5	[1] [1] [1]	[4]	
	(b) (i) Ruler Stopwatch	[1] [1]		
	(ii) Greater than (Threshold) The final speed is greater The initial speed is zero	[1] [1] [1]	[5]	
	(c) (i) Area under graph $1/2 \times (6-2) \times 4$ = 8 (m)	[1] [1] [1]		
	(ii) Child B distance = $6 \times 4 = 24$ distance apart = $24 - 8$ ecf for 8m from (i) = 16 (m)	[1] [1] [1]		
	(iii) $a = \text{gradient or } (v-u)/t$ = $4/4$ = 1 m/s^2	[1] [1] [1] [1]	[10]	

AVAILABLE MARKS
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- 2 (a) (i) downward arrow from the book labelled weight [2]
(ii) The book is stationary [1]
(iii) Friction [1] [4]
- (b) (i) **speed/velocity** [1]
(ii) $5.0 - 2.0 = 3.0$ (N) [1]
(iii) $F = ma$ [1]
 $3 = 0.5 \times a$ [1]
 $a = 6$ (m/s^2) Allow ecf from (ii) [1] [5]

(c) (i)

Force/N	Reading on the vertical scale/cm	Extension of the spring/cm
0	4.0	0
1	8.0	4.0
2	12.0	8.0
3	16.0	12.0

[2]

- (ii) $F = ke$ or $F = kx$ [1]
 $3 = k \times 12$ [1]
 $k = 0.25$ [1]
N/cm stand alone [1] [6]

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MARKS

(d) **Indicative content**

- Point
- Where the weight acts
- Diagonals meet
- Does not have a moment/turning effect
- The lower the CoG the more stable
- The wider the base the more stable

Response	Mark
Candidate describes in detail using good spelling, punctuation and grammar 5 or 6 points shown above. The form and style are of a high standard and specialist terms are used appropriately at all times.	[5]–[6]
Candidate describes 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]

[6]

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3 (a)

State of matter	Statement Numbers
Solid	1, 6
Liquid	2, 5
Gas	3, 4, 5

Each line correct $\frac{1}{2}$ round up for each row

[2]

(b) (i) Volume = $10 \times 3 \times 0.05$ or volume = length \times breadth \times depth [1]
= $1.5 \text{ (m}^3\text{)}$ or volume = length \times breadth \times height [1]

(ii) $M = D \times V$ [1]
= 2400×1.5 ecf for volume [1]
= $3\,600 \text{ (kg)}$ [1] [5]

(c) (i) Top is water
Middle is oil
Bottom is petrol
 $\frac{1}{2}$ each round up [2]

(ii) It increases [1] [3]

10

4	(a) (i) Chemical	[1]	
	(ii) Electrical as input	[1]	
	Heat } as output	[1]	
	Light }	[1]	[4]
(b)	(i) Wind Renewable		
	Coal Non-renewable		
	Hydroelectricity Renewable		
	Natural gas Non-renewable	[4]	
	(ii) Carbon dioxide released/acid rain	[1]	
	Causes global warming/climate change	[1]	[6]
	Any 2 from 4		
(c)	(i) Work = force × distance (moved) or $W = F \times D$	[1]	
	= 1000 × 6	[1]	
	= 6000	[1]	[3]
	(ii) $E_p = mgh$	[1]	
	= 250 × 10 × 2		[1]
	= 5000 (J)	[1]	[3]
	(iii) Friction	[1]	
	causes energy to be lost	[1]	
	as heat or sound	[1]	[3]

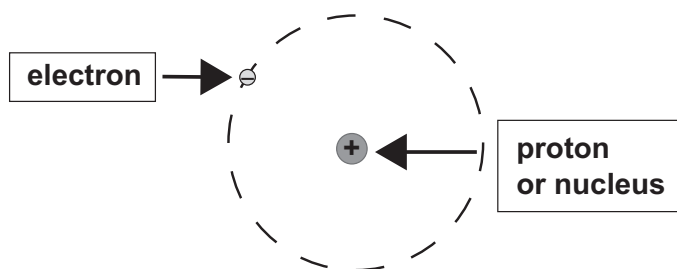
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MARKS

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5 (a) (i) Electron
Proton

[1]

[1]



(ii) The nucleus contains neutron(s)

[1]

(iii) Same number of protons/electrons

[1] [4]

(b) (i) Background is subtracted from the count rate

[1]

(ii) 120 to 60 = 1 half-life
1 half-life = 100 s

[1]

[1] [3]

(c) (i) (Nuclear) fusion

[1]

(ii) Light nuclei join
Energy is released dependent on 1st marking point

[1]

[1]

(iii) In the Sun

[1] [4]

Total

**AVAILABLE
MARKS**

11

80