



General Certificate of Secondary Education
2023

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit 7 Practical Skills
Booklet B
Foundation Tier



[GDW74]

GDW74

FRIDAY 16 JUNE, MORNING

TIME

30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all** questions.

INFORMATION FOR CANDIDATES

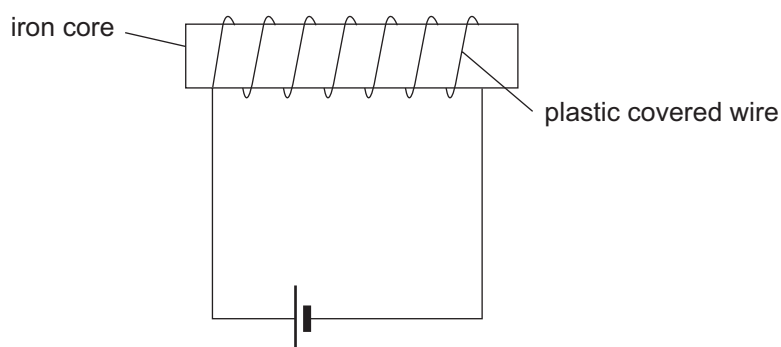
The total mark for this paper is 35.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **3(a)**.



- 1 An electromagnet can be made using plastic covered wire, a cell and an iron core.



Source: Chief Examiner

- (a) (i) State the name of an insulator and a conductor in the diagram above.

Insulator _____

Conductor _____ [2]

- (ii) Complete the table below with ticks (✓) to show what would happen to the strength of the electromagnet if the changes in the first column were made.

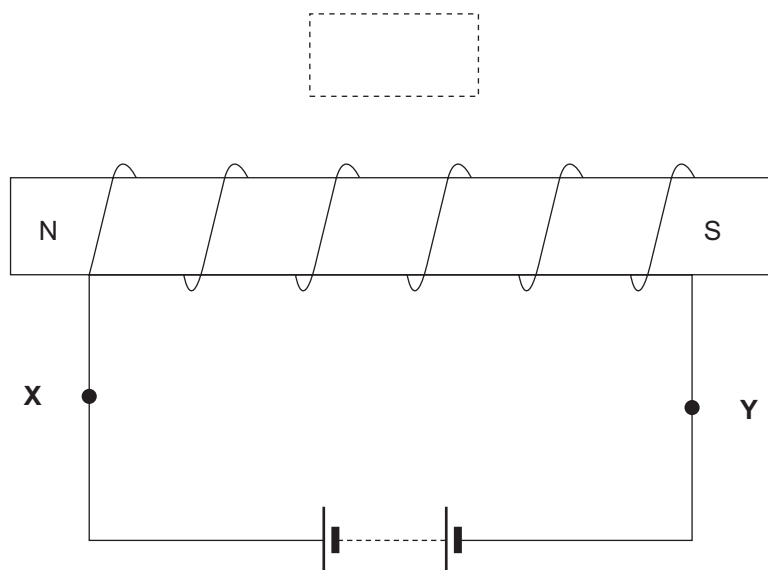
Tick only **one** box in each row.

	Strength increased	Strength decreased	Strength stays the same
Number of turns on the core is reduced			
Iron core is removed			
An extra cell is added			
The cell is reversed			

[4]



(b) Another electromagnet, with its polarity, is shown below.



Source: Chief Examiner

Draw an arrow to indicate the current direction at the point **X** on the diagram.

Use an arrow to indicate the direction of electron flow at the point **Y**.

Draw an arrow in the dotted rectangle above the electromagnet to show the direction of the magnetic field.

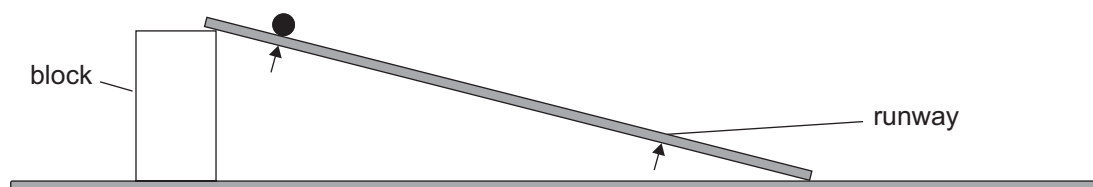
[3]

[Turn over



- 2 An investigation was carried out to determine how the average speed of a ball moving down a runway varies with its slope.

The slope of the runway was changed by using blocks of different height at the left-hand end.



Source: Chief Examiner

- (i) What two measuring instruments are needed to find the average speed in this investigation?

_____ and _____

[2]

- (ii) Two markers, indicated by arrows on the diagram, are shown on the runway.

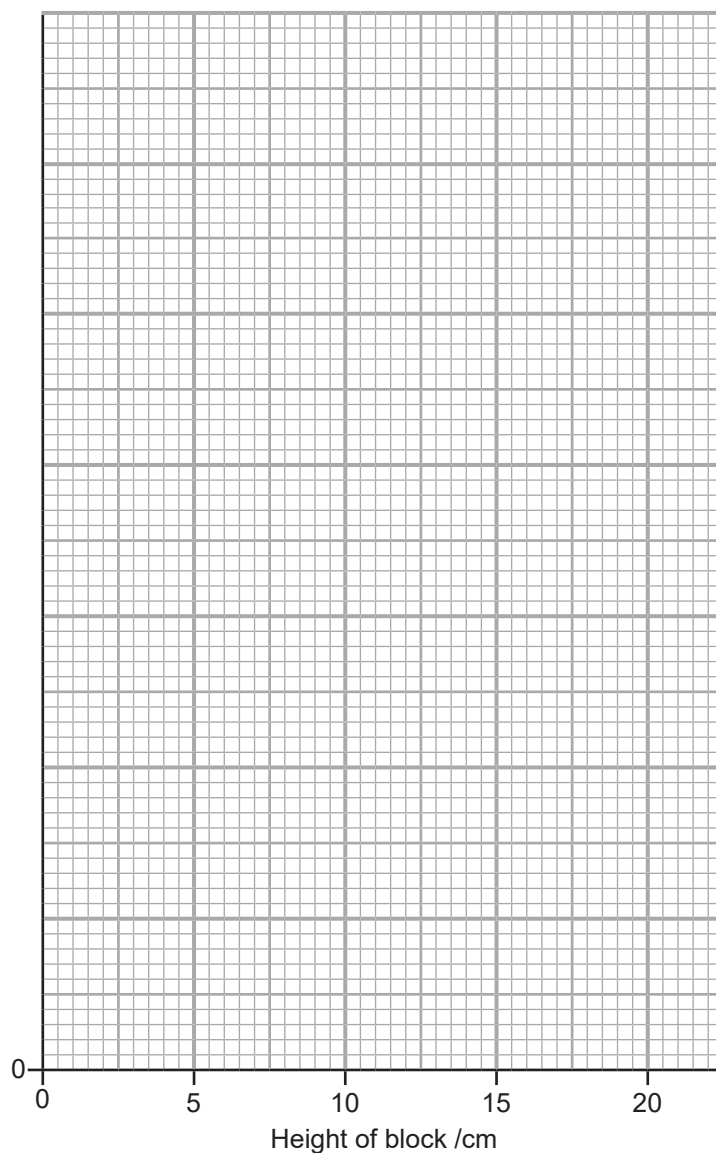
The ball starts from rest each time at the upper marker.

The average speed is found for different block heights.

The results of the investigation are shown in the table.

Height of block/cm	Average speed / cm/s
0	0.0
5	3.3
10	4.7
15	5.8
20	6.7





You are asked to plot a graph of average speed of the ball (vertical axis) against height of block (horizontal axis).

Choose a scale for the vertical axis and label it.

Plot the points.

Draw a curve of best fit beginning at the point (0,0).

Use the graph to find the average speed of the ball when the height of the block is 8 cm.

Average speed of the ball = _____ cm/s [5]

[Turn over



(iii) What does your graph show about the relationship between the height of the block and the average speed?

Indicate your answer by circling the correct relationship below.

Direct proportion

Inverse proportion

Some other relationship

[1]





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(Questions continue overleaf)

13921

[Turn over



12GDW7407

- 3 (a) A student carries out an experiment to demonstrate the refraction of light.

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

What name is given to the line drawn at right angles to the surface of a piece of glass?

Explain fully what is meant by refraction.

Name **two** essential pieces of laboratory apparatus used to demonstrate refraction.

The amount of refraction is related to the change of speed of light.

Complete the sentence below to show how they are related.

The greater the amount of refraction then the _____

[6]



- (b) When a ray of white light is directed towards a triangular glass prism, a range of colours may be displayed on a screen.

What is the name of this process?

What name is given to the range of colours on the screen?

State the names of the colours produced, beginning with the colour which has been **refracted most**.

[4]

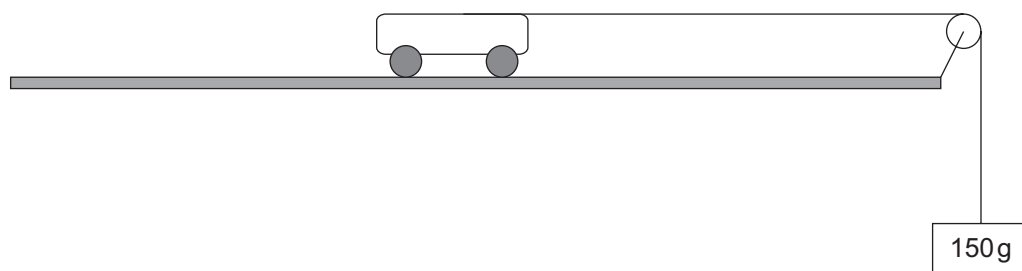
[Turn over

13921



12GDW7409

- 4 A student wants to investigate the motion of a trolley along a runway.



Source: Chief Examiner

- (a) (i) The weight of the 150 g mass provides a force.

Calculate the weight of the 150 g mass.

You are advised to show your working out.

Weight = _____ N [4]

- (ii) Which of the three equations below could be used to calculate the rate of change of speed?

Circle your answer.

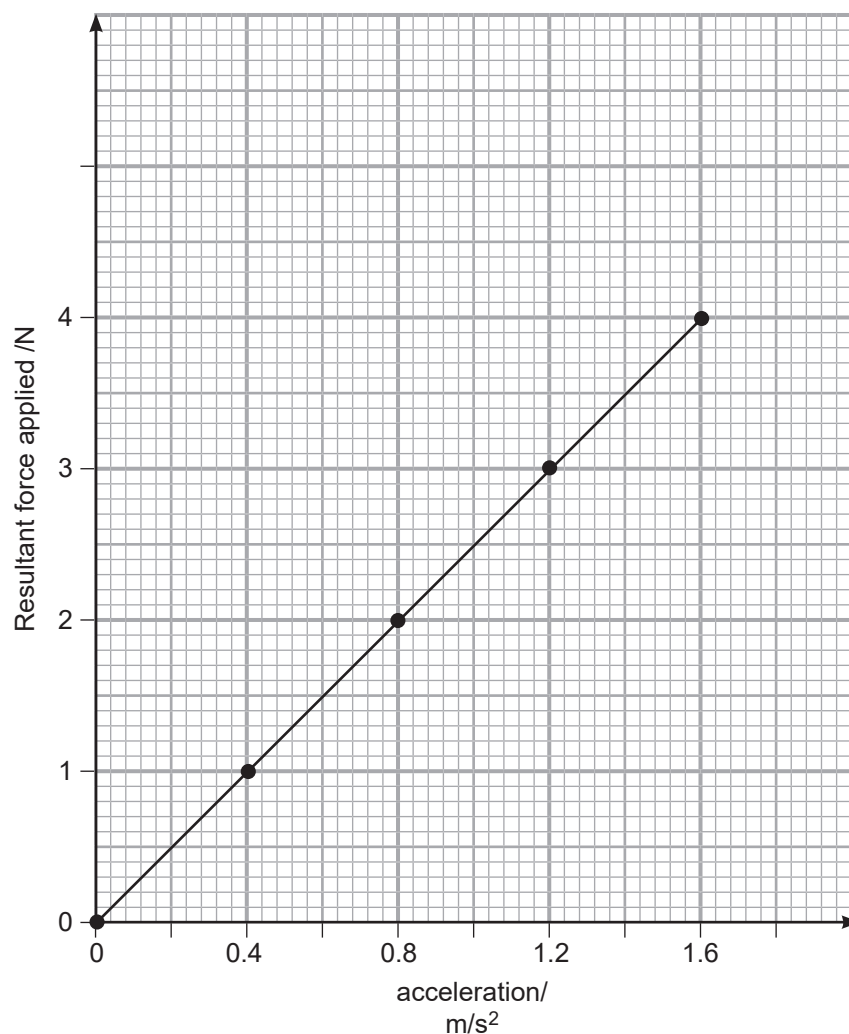
$$\text{rate of change of speed} = \frac{(\text{initial speed} + \text{final speed})}{2}$$

$$\text{rate of change of speed} = \frac{(\text{final speed} - \text{initial speed})}{\text{time}}$$

$$\text{rate of change of speed} = \frac{(\text{final speed} - \text{initial speed})}{2} \quad [1]$$



(b) A graph of resultant force on a trolley against its acceleration is shown.



Use the graph to find the mass of the trolley.

You are advised to show your working out.

Mass of trolley = _____ kg [3]



THIS IS THE END OF THE QUESTION PAPER

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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	

Total Marks	
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Examiner Number

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