



Rewarding Learning

General Certificate of Secondary Education
2024

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

TUESDAY 18 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.

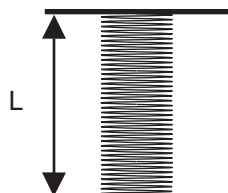
Quality of written communication will be assessed in Question **3(i)**.



1 (a) State Hooke's Law in words.

[2]

(b) A student measures the unstretched length, L , of a spring, as shown below.



(i) Name a piece of apparatus which could be used to find the unstretched length, L , of the spring.

[1]

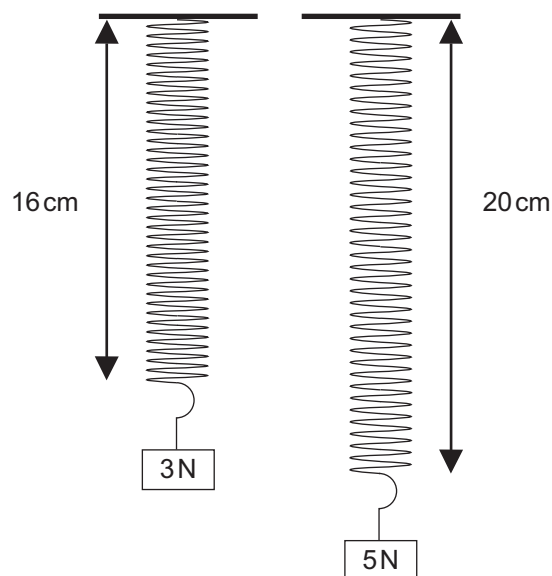
(ii) A weight is added to the lower end of the spring and the extended length is measured.

Describe how the extension of the spring is calculated.

[2]



- (c) When a 3 N weight is attached to the spring it has an extended length of 16 cm. When a 5 N weight is attached to the spring it has an extended length of 20 cm. Both examples are shown in the diagram below.



- (i) Calculate the extended length of the spring when a 4 N weight is attached to the spring.

Extended length of spring = _____ cm [1]

- (ii) The unstretched length of the spring is 10 cm. Use information from the diagram above to calculate the value of the spring constant.

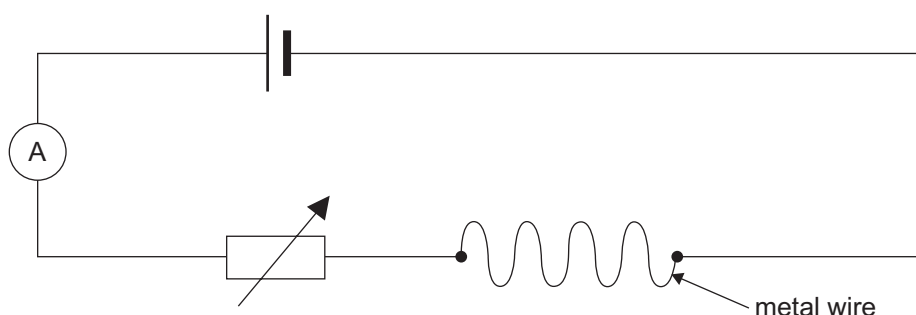
You are advised to show your working out.

Spring constant = _____ N/cm [4]

[Turn over



- 2 A student carries out an experiment on the resistance of a metal wire. The circuit diagram is shown below.



- (a) On the diagram, add the symbol for the voltmeter so that the voltage across the metal wire can be found.

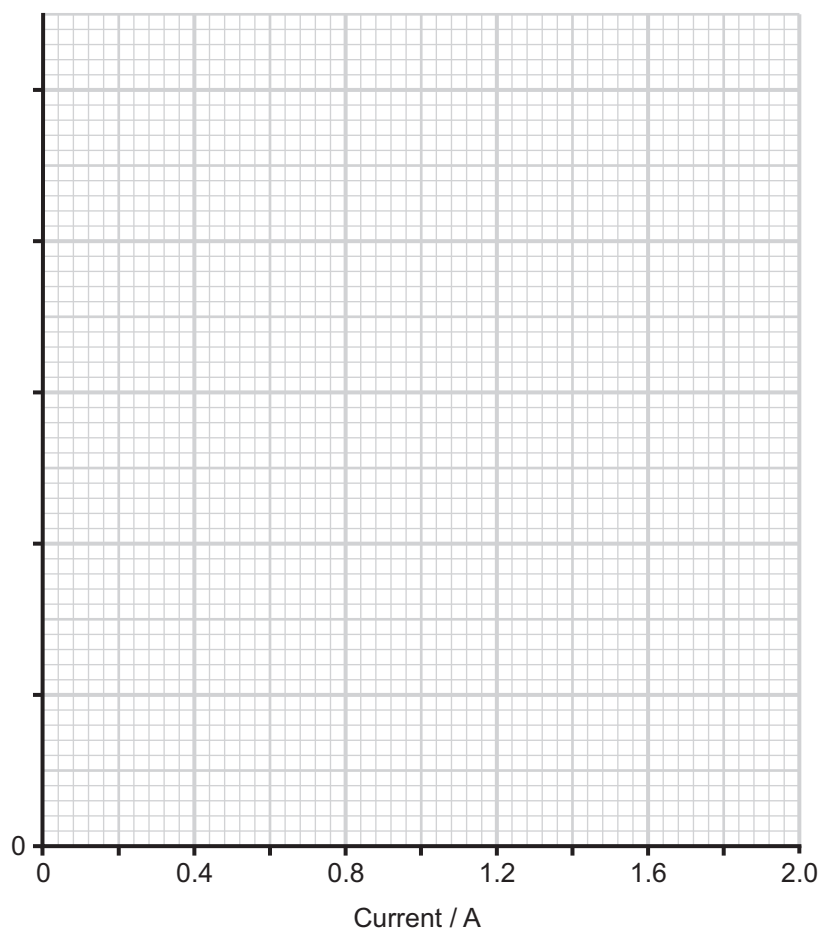
Name the component, in the circuit diagram, which will allow the current to be changed.

[2]

- (b) The results of the experiment are shown in the table below.

Voltage / V	Current / A
0.0	0.0
1.5	0.6
2.5	1.0
3.5	1.4
4.5	1.8
5.0	2.0





- (i) You are asked to plot a graph of voltage (vertical axis) against current (horizontal axis).

Choose a scale for the vertical axis and label it.

Plot the points.

Draw a straight line of best fit.

[5]

- (ii) Complete the following statement to describe the relationship between voltage and current as shown in the graph you have plotted.

The current is _____ to the voltage.

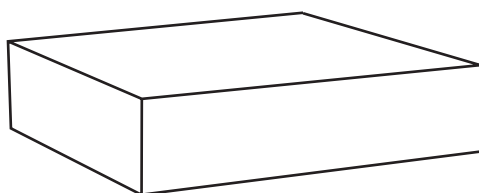
[1]

[Turn over]



- 3 (i) A student is given a rectangular box.

She wants to find the pressure exerted by the box on the floor.
She has measured the length of the box.



Source: Principal Examiner

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

State the names of two other measurements that are needed to calculate the pressure.

1. _____

2. _____

State the names of the two measuring instruments that are needed.

1. _____

2. _____

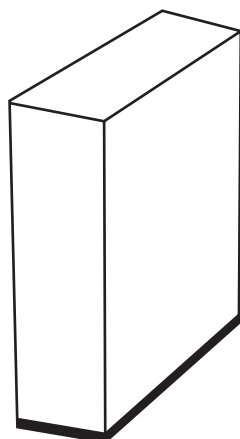
State fully, in words, the equation used to calculate pressure.

State a unit for pressure.

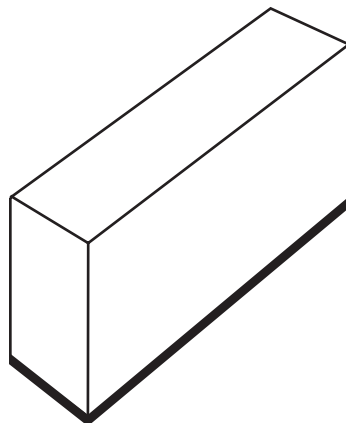
_____ [6]



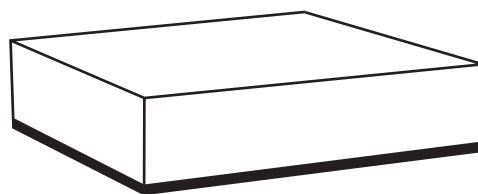
(ii) The student calculates the pressure exerted by the box in each of the positions shown below.



on floor
A



on floor
B



on floor
C

Source: Principal Examiner

In which position, **A**, **B** or **C**, will the box exert the **greatest** pressure on the floor?

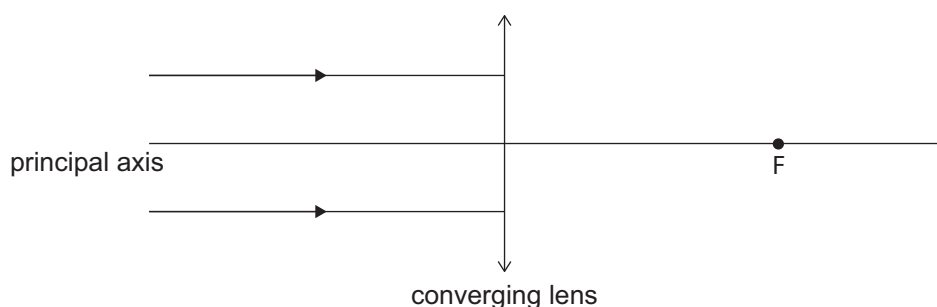
Explain your answer.

[2]



4 This question is about converging lenses.

- (a) Complete the diagram below to show the paths of the 2 rays of light after they pass through the lens.



Complete the sentence below to define the focal length of a converging lens.

The focal length is the _____ between the principal
_____ and the optical _____ of the lens.

[5]

- (b) A student wants to measure the focal length of a converging lens using a distant object.

The student is provided with a distant object, a converging lens, a lens holder and a metre rule.

State the name of the additional piece of apparatus needed.

During the experiment to find the focal length of the lens, the student observes the focused image to be real and smaller than the object.

State one other property of the image.

_____ [2]



(c) The student takes several measurements of the focal length as shown.

Focal length / mm	297	40	302	301
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Examine the results carefully and calculate the most reliable value for the focal length.

You are advised to show your working out.

Most reliable value for the focal length = _____ mm [2]

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Question Number	Marks
1	
2	
3	
4	

Total Marks	
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Examiner Number

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