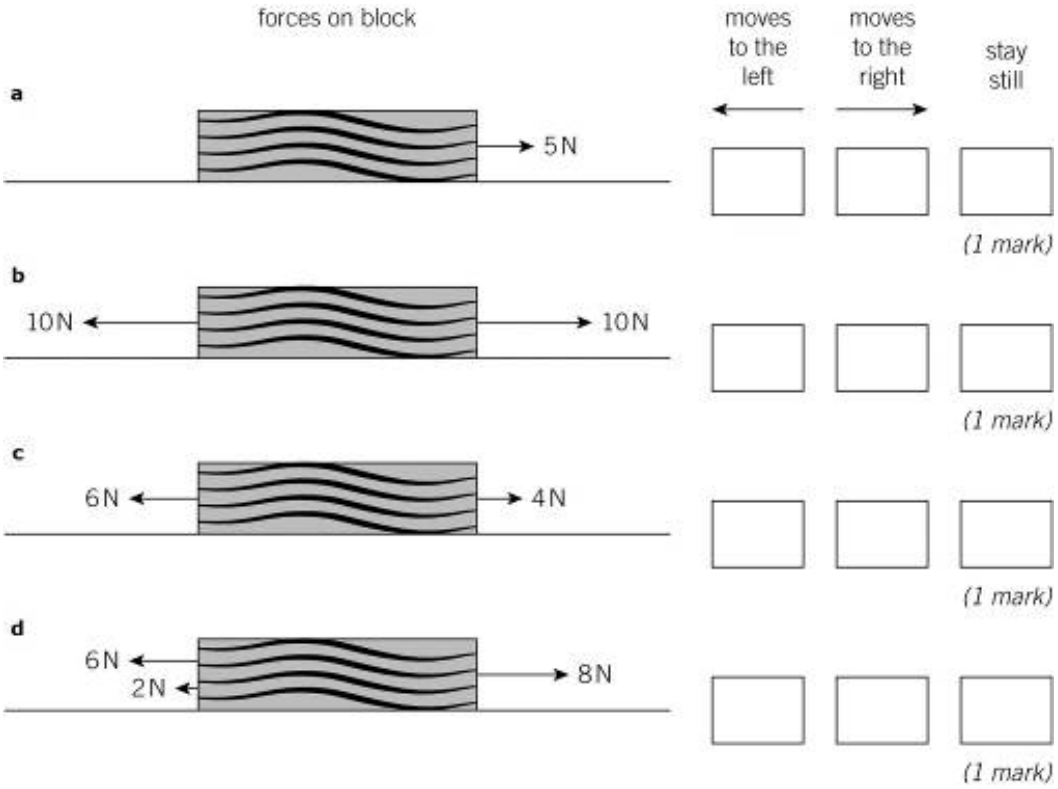
AQA Physics GCSE

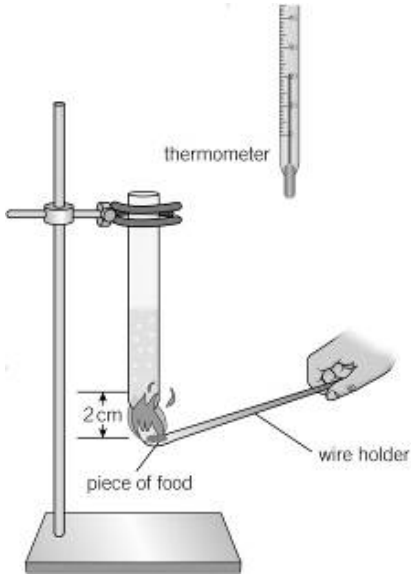
GCSE Baseline test Physics (Higher)

Name ..... **Class** ..... **Date** .....

1 For each of the blocks below, tick the correct box to predict whether it will move to the **left**, move to the **right** or **stay still**.



2 The amount of energy in different foods and solid fuels was calculated by burning the fuel under a tube of water using the apparatus shown. The results were recorded in the table below.



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Fuel	Energy Joules per gram (J/g)
coal	3900
crisps	500
popcorn	100
wood	2000

a Which fuel released the most energy?

..... (*1 mark*)

b Why are these energy values **not** the same as the ones quoted in scientific books?

.....

..... (*1 mark*)

c Name one variable you would need to control in this experiment.

..... (*1 mark*)

3 Bradley is completing time trials on a 400 m track.

a Describe two pieces of apparatus you would use to determine an accurate value for Bradley's speed during his 400 m race.

.....

..... (*2 marks*)

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b He recorded his times each day for a week in the table below:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
52.05 s	54.08 s	51.46 s	38.24 s	56.94 s	52.36 s	50.33 s

i Identify which value is incorrect in the table and give a reason why this might have occurred.

.....

..... (*1 mark*)

ii Bradley is timed for the same race by another trainer who is using a different timing device. When his results are compared to those in the table above, he notices that his times are all greater by a value of 0.8s.

Name the type of error that may have occurred and how it can be corrected.

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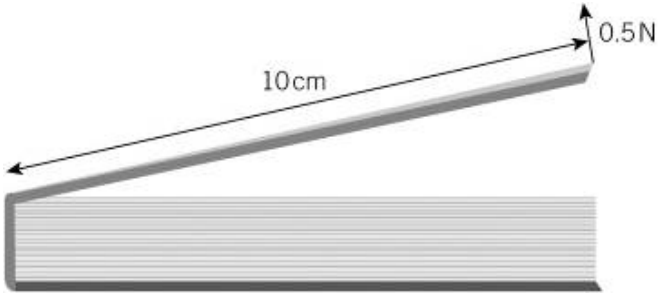
..... (*2 marks*)

4 Jamie is doing his homework. He opens the cover of the text book with a force of 0.5 N, with his fingers 10 cm from the spine.



Calculate the turning moment Jamie used to open the book. Show your working and give the correct units in your answer.

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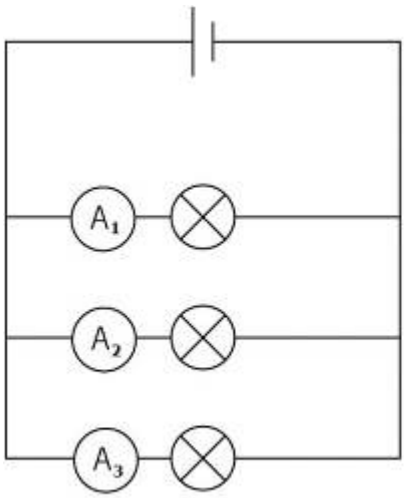
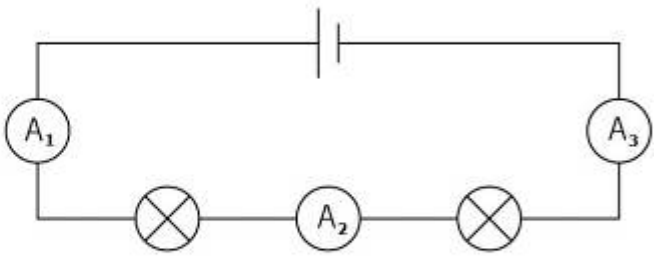
..... *(3 marks)*

5 Tom built two circuits as below, all of the bulbs are identical, and the voltage was kept at 12 V in each circuit. Tom measured the current in each circuit at each of the positions labelled A1-A3.



A



B

a Describe the pattern he should see in the readings A1-A3 in circuit B.

.....

..... (*1 mark*)

b What type of circuit is B ?

..... (*1 mark*)

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c Tom measured the voltage over each bulb in both circuits.
Complete the table with the values you would expect for each circuit.

Position of voltmeter	Circuit A (V)	Circuit B (V)
over bulb 1	12	6
over bulb 2		
over bulb 3		

(*3 marks*)

6 Carwen thinks that a drop of water on a page will act as a magnifying glass and make the writing on the page appear bigger.

Amie thinks that a drop of water on a page will act as a lens and make the writing appear smaller.

a Design an investigation to determine whether Carwen's hypothesis or Amie's hypothesis is right. Your plan should refer to the variables involved and the data that you need to collect.

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..... *(5 marks)*

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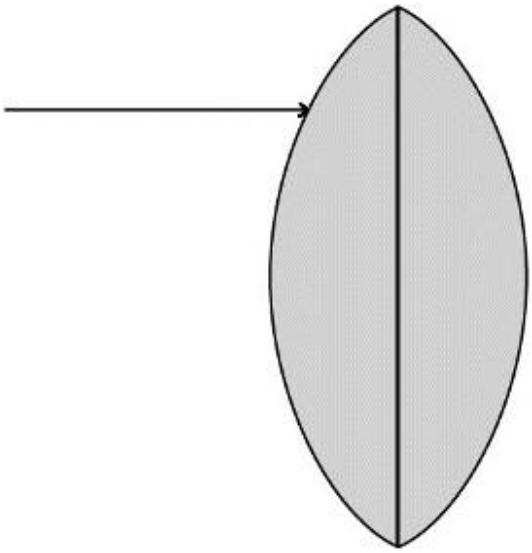
b Predict the path of the ray of light as it passes through the lens below. Drawn lines on the diagram to show the path the rays will take.



(*2 marks*)

7 The Mars Rover has a weight of 8990 N on Earth. It has 6 wheels that each have an area of 2.5 m^2.

a Calculate the pressure of the rover on the surface of the Earth. Don't forget to show all working and the units in your answer.

..... *(3 marks)*

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b The average temperature on Mars is −60°C.
What affect will this have on the particles of air in the tyres?

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..... (*2 marks*)

c The Mars rover weighs just 3416 N on the surface of Mars.
Explain how it can weighs **less** on Mars than on Earth.

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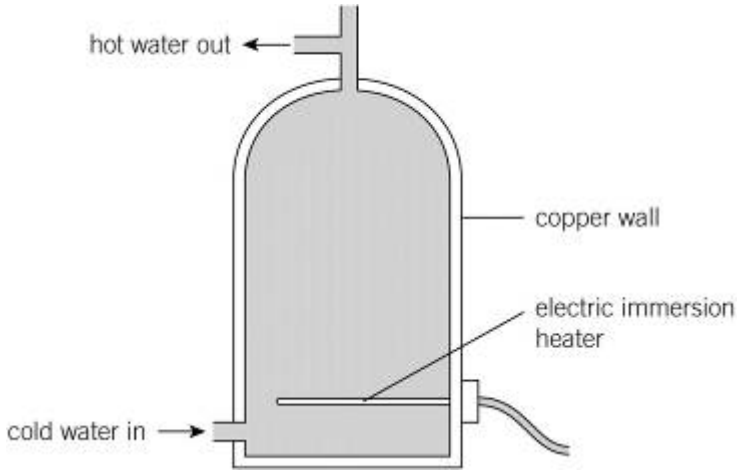
..... (*2 marks*)

8 An immersion heater heats water up on demand. Explain how the water next to the electric heater heats up and eventually brings all the water in the tank to the same temperature.



In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

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..... *(6 marks)*

9 Samantha sits on a see-saw 2.5 m from the pivot. Jasmine balances the see-saw by sitting 2 m on the other side of the pivot.

a Who is the lightest, Samantha or Jasmine?

..... (*1 mark*)

b Jasmine weighs 425 N. What is Samantha's weight?

..... *(3 marks)*

c Samantha gets off and John gets on, he weighs 450 N.
Where should he sit to balance the see-saw?

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..... *(4 marks)*

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10 In the UK over 70% of all electricity is generated from fossil fuels. The government is trying to increase the amount of electricity produced by renewable energy sources.

a Explain one possible cause and effect of burning fossil fuels on the environment.

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..... (*2 marks*)

b Explain the advantages and disadvantages of producing electricity using wind turbines as opposed to coal.

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..... *(6 marks)*

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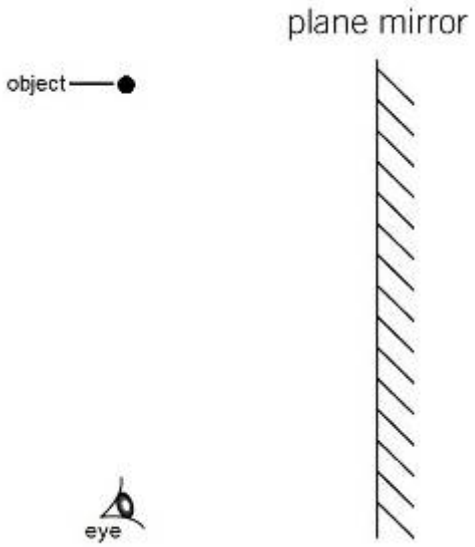
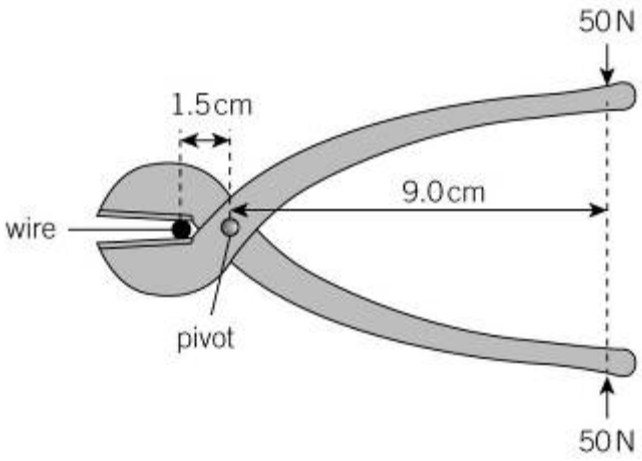
11 An object is placed in front of a plane mirror. An image of the object appears in the mirror.

Complete the ray diagram to show how the image of this arrow is formed.
Mark the position of the image.



(*4 marks*)

12 Erin uses a pair of wire cutters as shown in the diagram below.



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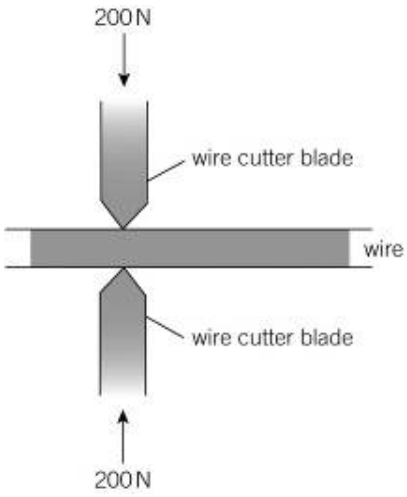
a i Calculate the turning moment of each handle on the wire when she applies 50 N of force. Give the correct units in your answer.

..... *(3 marks)*

ii Calculate the force of each blade on the wire. Give the correct units.

..... *(2 marks)*

b Jack applies a force of 200 N to the blades as shown in the diagram. The area of the blades in contact with the wire is 0.0005 m^2.



i Calculate the pressure of each blade on the wire.

..... *(3 marks)*

ii The more use the blades have over time, the lower the pressure on the wire becomes. Explain the decrease in pressure with use.

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..... (*2 marks*)