



Rewarding Learning

General Certificate of Secondary Education

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit P1

Foundation Tier



[GDW31]

GDW31

Assessment

TIME

1 hour.

Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

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 nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

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 **6(a)**.



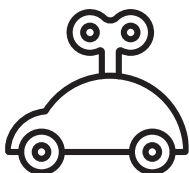
- 1 Many devices change energy from one form to another. Describe the **main** energy change in the examples below. An example has been completed for you.

An electric heater.



Electrical energy to *heat* energy.

A spring operated toy car.



_____ energy to _____ energy.

A campfire.



_____ energy to _____ energy.

A loudspeaker.



_____ energy to _____ energy. [6]



2 Energy resources may be renewable or non-renewable.

- (a) Which **two** of the following statements could be applied to a renewable energy resource?

Place a tick (✓) in each correct box.

The resource can be used over and over again.

☐

The resource will never run out.

☐

The resource can be replenished within a human lifetime.

☐

The resource causes great harm to the environment.

☐

[2]

- (b) In the table below indicate whether the resource is renewable or non-renewable.

Write R beside the resource which is renewable.

Write N beside the resource which is non-renewable.

Resource	Renewable (R) or Non-renewable (N)
wood	
hydroelectricity	
nuclear	
tidal	

[4]

[Turn over



- 3 A student carries out an experiment to find the density of a liquid in g/cm^3 . She obtains the following readings.

Mass of liquid + container = 760 g

Volume of liquid = 700 _____

- (a) Insert the unit for volume of liquid on the line above.

What piece of laboratory apparatus would you use to find the volume of the liquid?

What other mass reading is needed to allow the student to find the density of the liquid?

_____ [3]

- (b) The mass of the liquid in this experiment is 560 g. Calculate the density of the liquid.

You are advised to show your working out.

Density = _____ g/cm^3 [3]





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[Turn over



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- 4 Two runners, 160 m apart, start to run directly towards one another at the **same speed**.



© Getty Images

- (i) What distance has each runner travelled when they pass?

_____ m [1]

- (ii) The runners pass each other 20 seconds after starting.

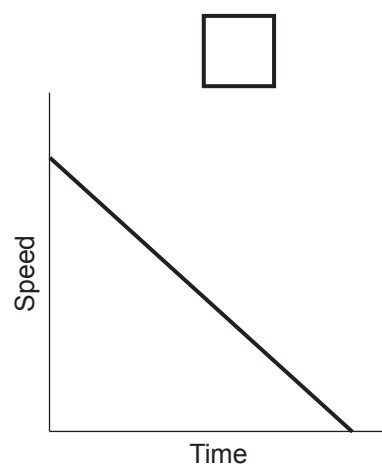
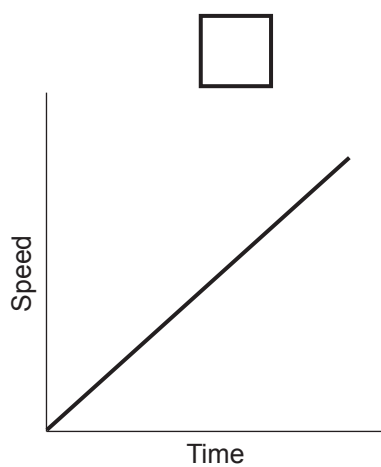
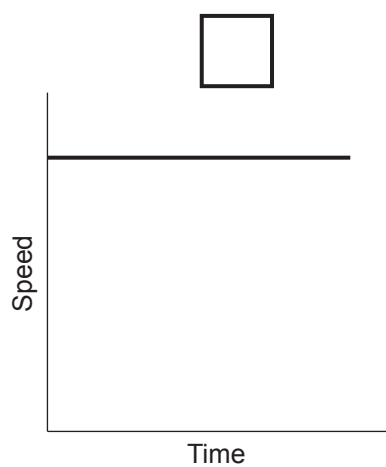
Calculate the speed of each runner.

You are advised to show your working out.

Speed = _____ m/s [3]



(iii) Which graph below represents the speed-time graph of each runner?
Choose your answer by placing a tick (✓) in the correct box.



[1]

[Turn over



5 (a) State the Principle of Conservation of Energy.

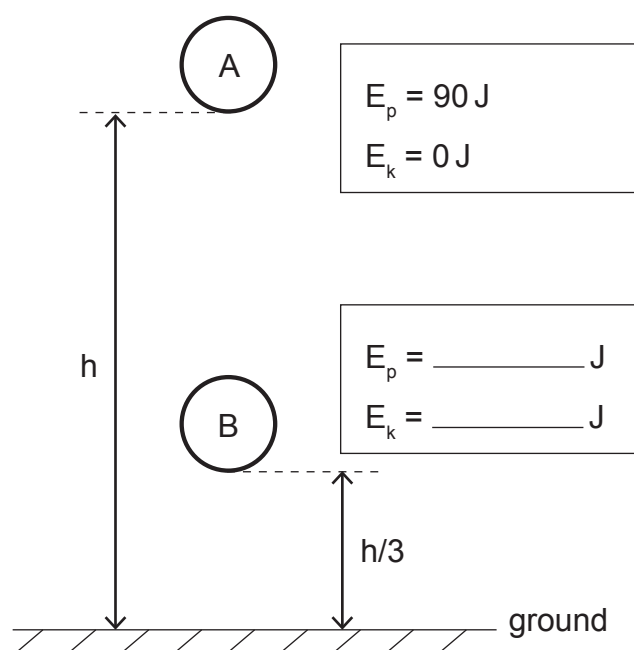
[2]

A ball is thrown vertically into the air.

The diagram gives information about the ball's potential energy, E_p , and kinetic energy, E_k , at two positions A and B.

Position A is at the top of the ball's motion.

Position B is one third of the full height of the ball's motion.



(b) (i) What is the ball's speed at position A?

Speed at A = _____ m/s

Fill in the remaining values of potential energy and kinetic energy at position B.

[3]



- (ii) A ball has a mass of 1.5 kg and is at a height of 4 m.
Calculate the potential energy of the ball.

You are advised to show your working out.

Potential energy = _____ J [3]



- 6 (a) Name the three particles which make up an atom.
For each particle state its relative charge.

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

Particle 1

Particle 2

Particle 3

[6]



(b) The nucleus of an element X may be written as shown below.



Complete the statements below.

A is the _____ number.

Z is the _____ number.

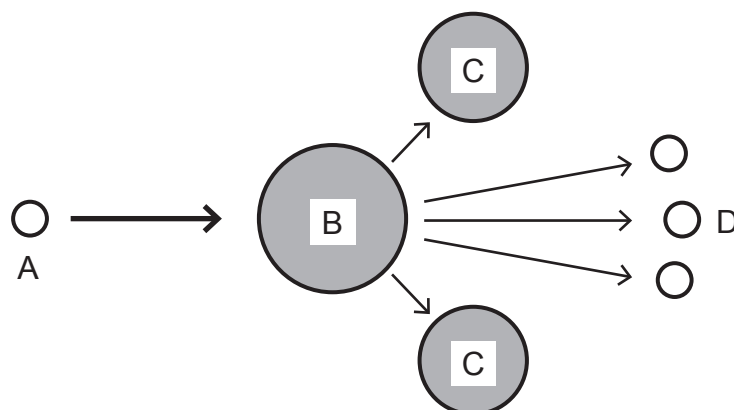
Consider an isotope of X.

Which of the three, A, X or Z, will have changed?

Answer = _____ [3]



- 7 Fission and fusion are nuclear reactions which produce energy.
The diagram represents one type of nuclear reaction where B is the nuclear fuel.



Source: Principal Examiner

- (a) What nuclear process is represented above?

Process _____ [1]

- (b) Name the particle A.

Particle A _____ [1]

- (c) What happens to particle A when it strikes B?

_____ [1]

- (d) Name a fuel represented by B.

Fuel B _____ [1]

- (e) The particles labelled D in the diagram play an important role in the nuclear reaction. What is this role?

_____ [1]





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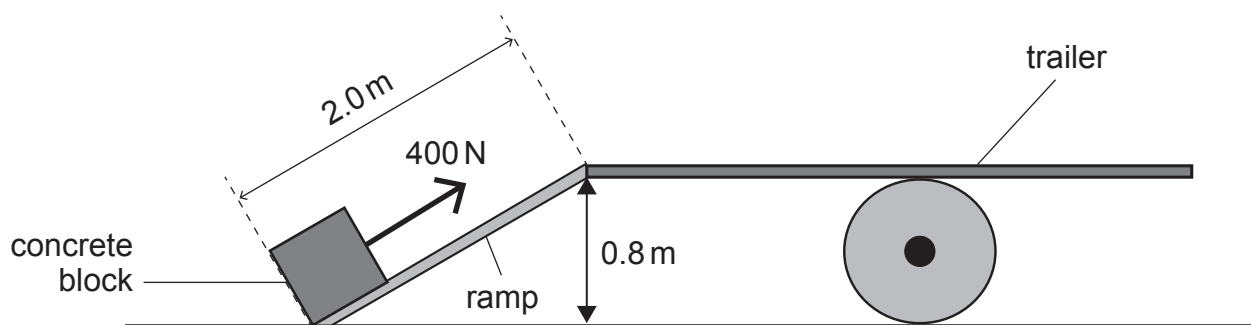
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- 8 A concrete block is pulled up a ramp onto a trailer.



Source: Principal Examiner

- (a) Use the information shown in the diagram to calculate the work done by the 400 N force.

You are advised to show your working out.

Work done = _____ J [4]



- (b) On another occasion 600 J of useful work is done on a different block of concrete.

The efficiency of the process is 0.8.

Calculate the total input energy needed to do this work.

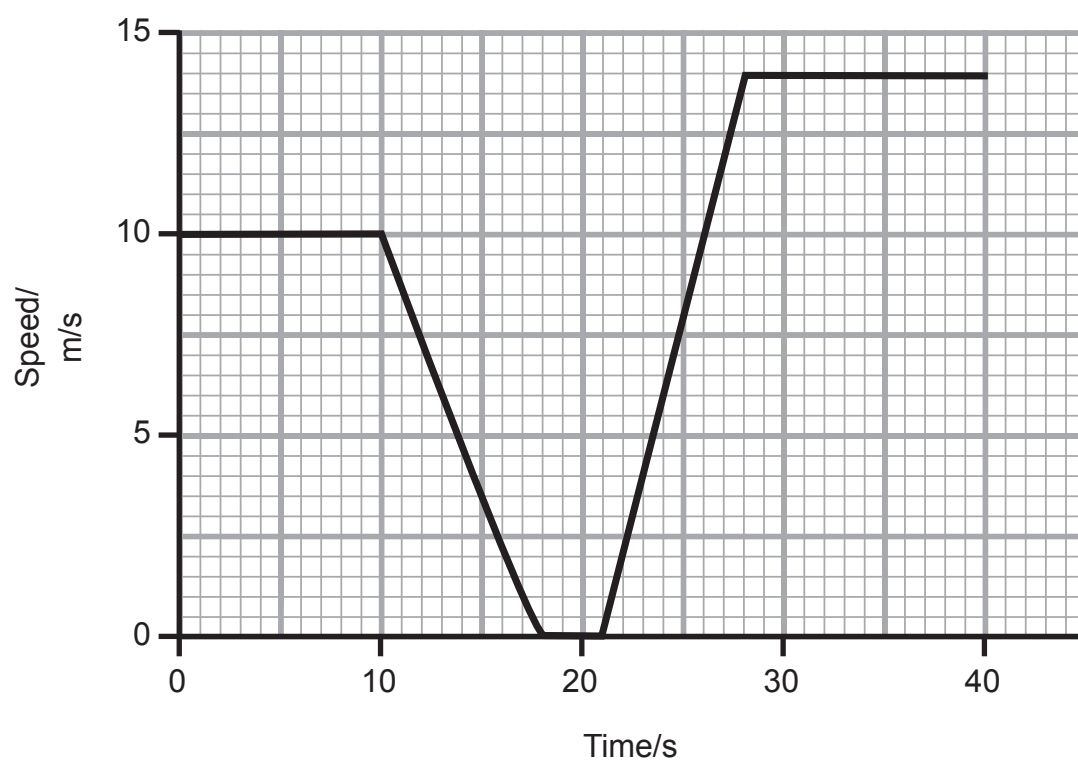
You are advised to show your working out.

Total input energy = _____ J [3]

[Turn over



- 9 The speed-time graph for part of a bike journey is shown below.



- (i) Describe the motion of the bike during the time interval 10 s to 18 s.

Between which times is the bike stopped?

_____ to _____ s [2]



- (ii) Calculate the bike's rate of change of speed between 21 and 28 seconds.

You are advised to show your working out.

Rate of change of speed = _____ m/s² [3]

- (iii) How far does the bike travel between 10 and 18 seconds?

You are advised to show your working out.

Distance travelled = _____ m [3]

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For Examiner's use only	
Question Number	Marks
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2	
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Total Marks	
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Examiner Number

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