



UNITED LEARNING

YEAR 7

SCIENCE

END OF YEAR PHYSICS ASSESSMENT 2023

TIME ALLOWED: 40 MINUTES

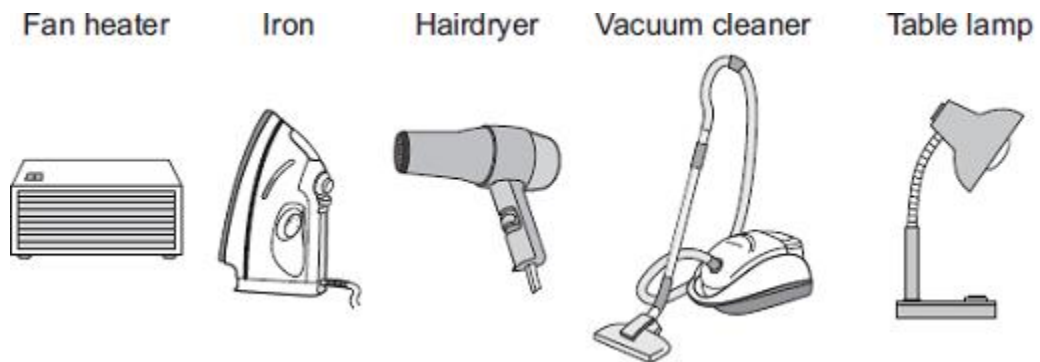
Student Name	
Class	

Total Mark

/40

QUESTION 1 – Energy Stores and Transfers (5 marks)

The pictures show six different household appliances.



1.1 Name **one** appliance that usefully transfers energy into a thermal store.

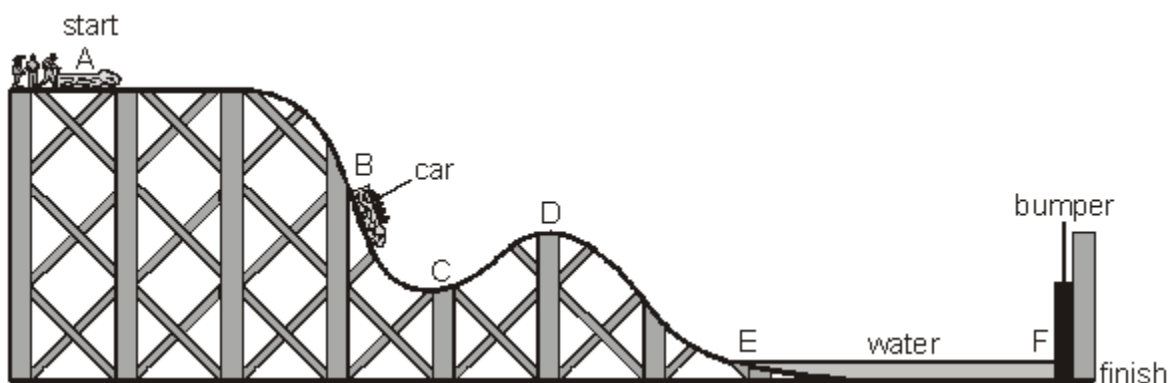
1

1.2 The table lamp wastes some energy.
What happens to this wasted energy?

1

The drawing below shows a theme-park log ride.

The letters A, B, C, D, E and F show different points along the track.



1.3 Where is the gravitational potential energy the highest?

Give the correct letter.

1

1.4 Energy is always conserved during all energy transfers.

What does 'energy is conserved' mean?

1

1.5 A man drops a ball.

Before it hits the ground, which store is increasing as it falls?

Tick the correct box.

Gravity store

Elastic store

Kinetic store

Gravitational store

1



QUESTION 2 – ENERGY RESOURCES (5 marks)

Solar cells are used to generate electricity.

Solar is an example of a renewable energy resource.

2.1 Give another example of a renewable energy resource.

1

2.2 Give one advantage of all renewable energy resources.

1

2.3 Give one disadvantage of solar cells.

1

Solar cells work by absorbing radiation from the sun.

Radiation is also form of heat transfer.

Radiation can transfer heat though a vacuum.

2.4 Give the name of a form of heat transfer through fluids.

1

2.5 Give the name of a form of heat transfer through solids.

1



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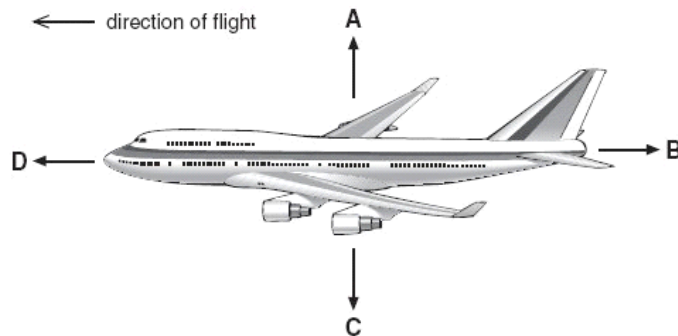
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TURN OVER ►

QUESTION 3 – FORCES (4 marks)

The diagram shows four forces acting on a plane in flight.



3.1 Which arrow represents air resistance?

Give the **letter**.

1

3.2 Which arrow shows the direction of weight?

Give the **letter**.

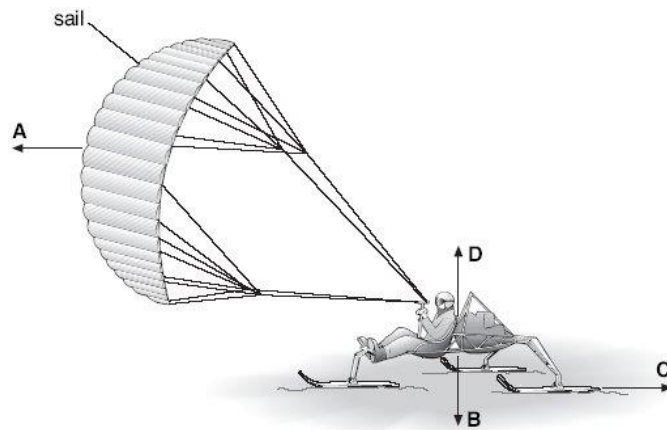
1



The drawing below shows a snow-buggy being pulled by a sail.

The buggy rests on three skis on the snow.

The drawing shows four forces that act when the snow-buggy is moving.



3.3 Which arrow represents the normal reaction force of the ground on the buggy?

Give the **letter**.

1

3.4 The buggy is moving.

The forces in the buggy are balanced.

Describe the motion of the buggy.

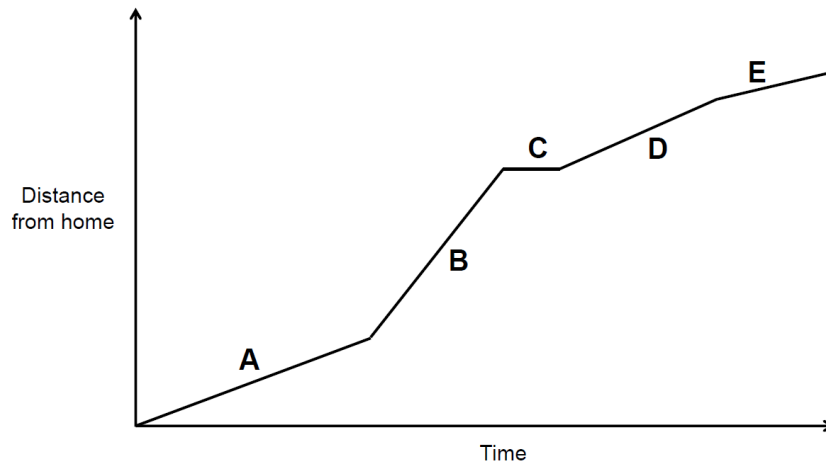
1



QUESTION 4 – DISTANCE-TIME GRAPH (5 marks)

A woman is driving in her car from her home to work.

The graph shows how the distance from her home changes with time.



- 4.1 Which part of the graph, **A**, **B**, **C**, **D** or **E**, shows when she was stationary?

Write your answer in the box.

Give the reason for your answer.

2



- 4.2 It is 12 600 m from her home to work, and the whole journey takes 700 seconds.

Calculate the average speed of the car over the whole journey.

Use the equation:

$$\text{speed} = \text{distance} \div \text{time}$$

Speed: _____ m/s

2

- 4.3 A man is travelling in a car at a speed of 25 m/s.

A second car is travelling in the **opposite direction** at a speed of 15 m/s.

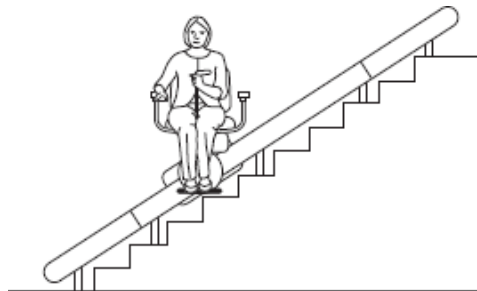
How fast does the second car appear to be travelling to the man in the first car?

1

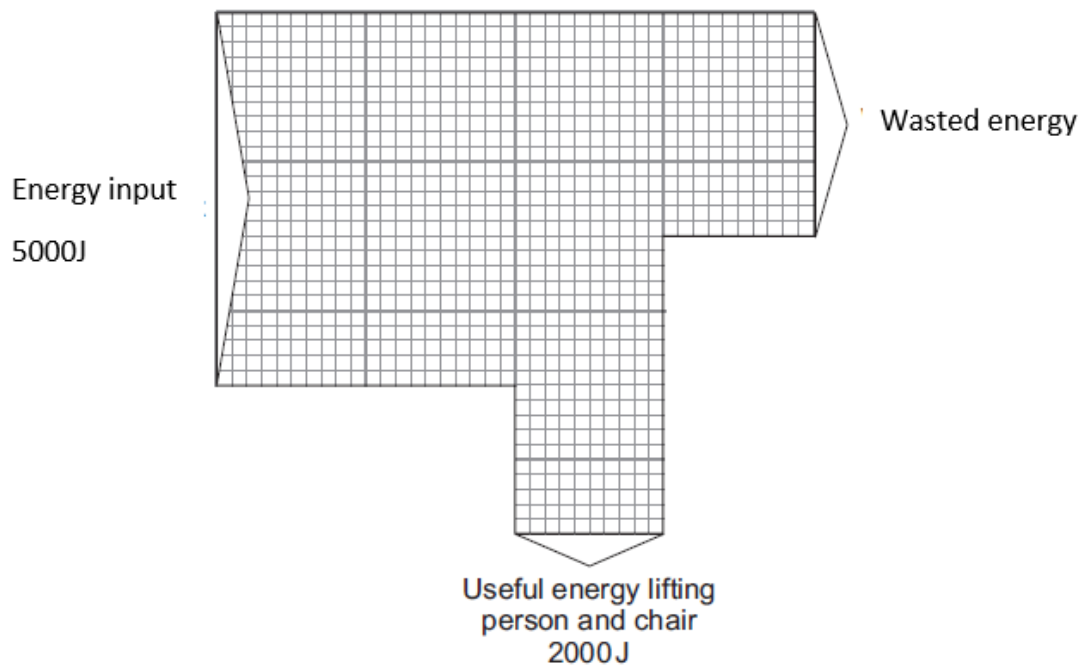


QUESTION 5 – EFFICIENCY (3 marks)

A person uses a stairlift to go upstairs. The stairlift is powered by an electric motor.



The Sankey diagram shows the energy transfers for the electric motor.



5.1 How much energy is wasted?

..... J

1



- 5.2 Use the equation in the box to calculate the efficiency of the electric motor.

$$\text{efficiency} = \frac{\text{useful energy transferred by the device}}{\text{total energy supplied to the device}}$$

Show clearly how you work out your answer.

Efficiency = _____

2

Turn over for the next question.



QUESTION 6 – WEIGHT INVESTIGATION (4 marks)

A student investigated the relationship between mass and weight.

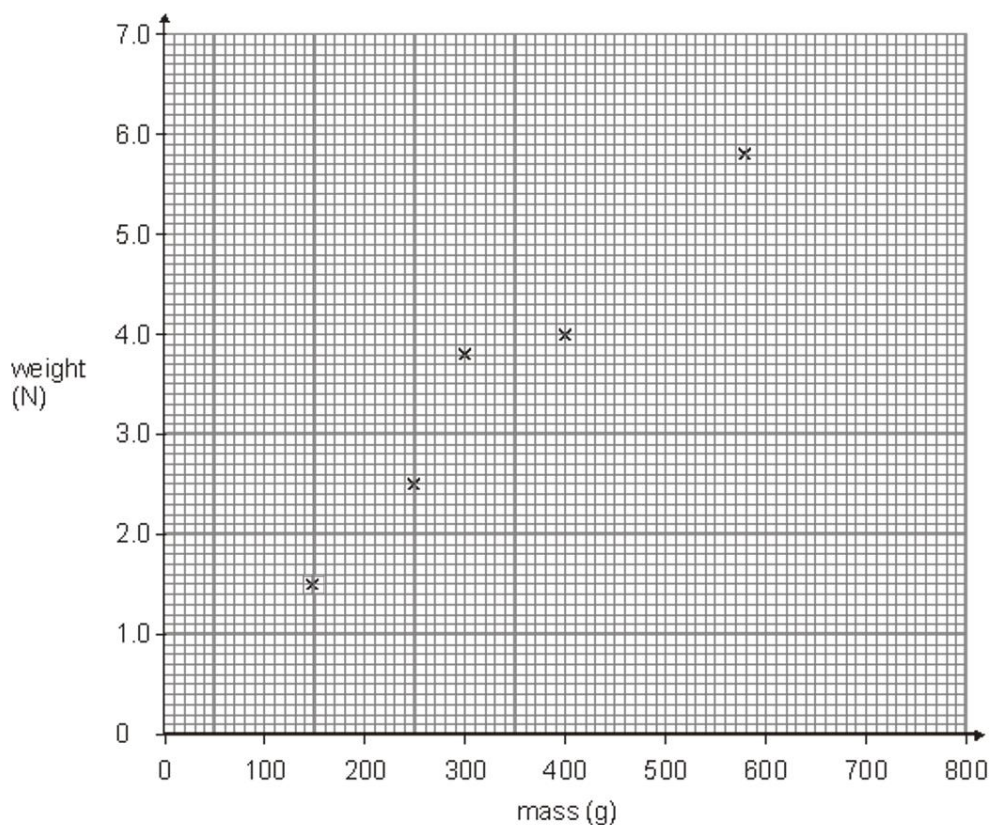
He weighed five different masses using a force meter.

His results are shown in the table.

Mass (g)	Weight (N)
150	1.5
250	2.5
300	3.8
400	4.0
580	5.8

He plotted his results on a grid as shown below.

6.1 Draw a line of best fit.



1

6.2 One of the points Russell plotted does **not** fit the pattern.

Circle this point on the graph.

1



TURN OVER ►

6.3 Use your line of best fit to predict the mass of an object weighing 6.5N

_____g

1

6.4 Give **one** reason why it is more useful to present the results as a line graph, rather than a table.

1

Turn over for the next question.



QUESTION 7 – PRESSURE (6 marks)

Below are four types of footwear in a sports shop.



ski boot



trainer



ice skate



walking boot

The same person tries on each type of footwear.

7.1 Which one sinks into the carpet the most?

1

7.2 When the person tries them all on, what is the same for each type of footwear?

Tick the correct box.

1

the area of the footwear

the person's weight on the footwear

the material of the footwear

the weight of the footwear



The drawing below shows a snowshoe.



7.3 How do snowshoes help people to walk in deep snow?

1

7.4 A shoe has an area of 0.02m^2 , the weight of the person wearing the shoe exerts a force of 1400N .

Calculate the pressure exerted on the floor by the shoe.

Use the equation:

$$\text{Pressure} = \text{force} \div \text{area}$$

Give the correct unit.

Pressure: _____ Unit: _____

3



QUESTION 8 – POWER (8 marks)

The picture below shows a television.



8.1 In 3 minutes the television has 5400 J of energy transferred to it.

Calculate the power input in **watts** to the television

Use the equation:

$$\text{power} = \text{energy} \div \text{time}$$

Power: _____ W

3



8.2 A woman compared two different televisions.

Television A is **more** efficient than television B.

They are the same in all other ways.

Which television will be cheaper to run?

Explain your answer.

3

8.3 An engineer is comparing two different electric motors.

She uses them to transfer the same amount of energy.

Motor A transfers the energy in 24 s.

Motor B transfers the energy in 6 s.

Use the data above to compare the power of the two motors.

2

END OF ASSESSMENT



TURN OVER ►

This is the end of the assessment.
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