



UNITED LEARNING

YEAR 9

SCIENCE

END OF YEAR PHYSICS ASSESSMENT 2023

TIME ALLOWED: 40 MINUTES

Student Name	
Class	

Total Mark

/40

QUESTION 1 – ENERGY STORES AND PATHWAYS (8 marks)

1.1 Match the energy stores to their correct description.

4

Gravitational potential

The energy stored in a moving object

Elastic potential

The energy stored in an object raised off the ground
--

Kinetic

The energy stored in an object that is stretched or compressed
--

Electrostatic

The energy stored when opposite charges are separated

1.2 Energy is transferred from one store to another by pathways.

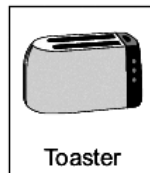
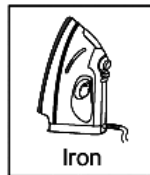
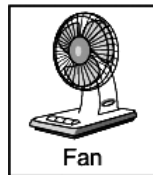
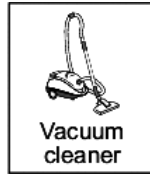
Electricity is an example of a pathway that transfers energy.

Name **two** other pathways that transfer energy.

2



The appliances shown below transfer energy electrically to other energy stores.



1.3 Which **two** of the following statements are true?

Tick (✓) **two** boxes

Appliances only transfer part of the energy usefully.

The energy transferred by appliances will be destroyed.

The energy transferred by appliances makes the surroundings warmer.

The energy output from an appliance is bigger than the energy input.

2

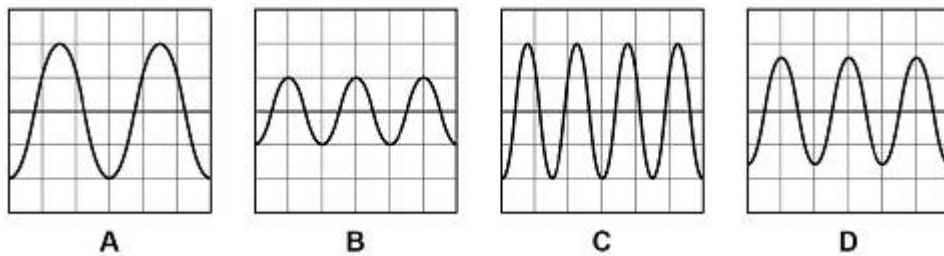


QUESTION 2 – WAVES (5 marks)

The diagram shows four waves, **A**, **B**, **C** and **D**.

All four waves are shown on oscilloscope screens.

The oscilloscope settings are the same for each screen.



2.1 Which wave has the smallest amplitude?

Tick (✓) **one** box.

A

B

C

D

1

2.2 Which wave has the highest frequency?

Tick (✓) **one** box.

A

B

C

D

1

2.3 How many complete wavelengths are shown in wave **A**?

Number of complete wavelengths = _____

1



2.4 Waves can be longitudinal or transverse.

Longitudinal and transverse waves each have different directions of oscillations.

Use **one** of the following words to complete the following sentence:

parallel

perpendicular

proportional

The oscillations are _____ to the direction of energy transfer in transverse waves.

1

2.5 Which of the following is an example of a longitudinal wave?

Tick (✓) **one** box.

Sound

Visible light

Wave on a string

1

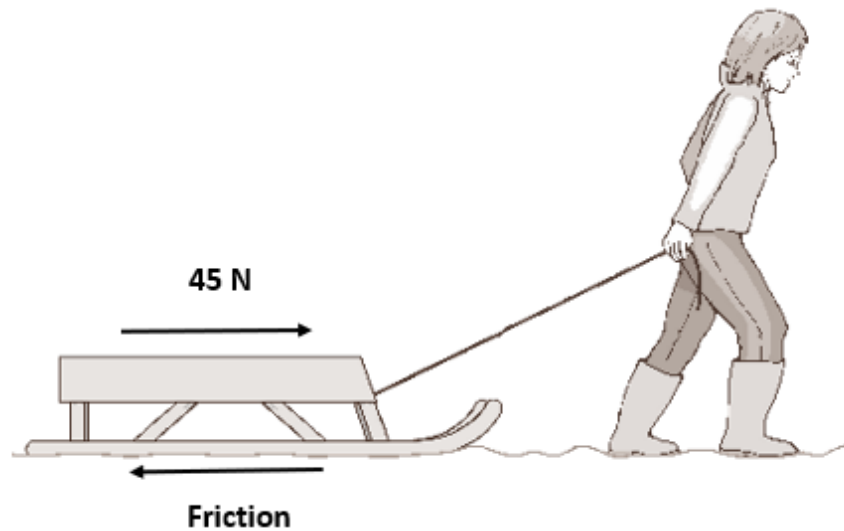
Turn over for the next question.



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QUESTION 3 – FORCES AND WORK (6 marks)

The diagram shows a woman using a constant force of 45 N to pull a sledge.



The sledge moves at a constant speed in a straight line.

3.1 State the size of the friction force acting on the moving crate.

_____ N

Give the reason for your answer.

2



3.2 945 J of work is done by the woman pulling the sledge.

She pulls with a constant force of 45 N.

Calculate the distance the sledge is pulled in this time.

Show clearly how you work out your answer.

Use the Physics Equation Sheet to help you.

Distance = _____ m

4

Turn over for the next question.

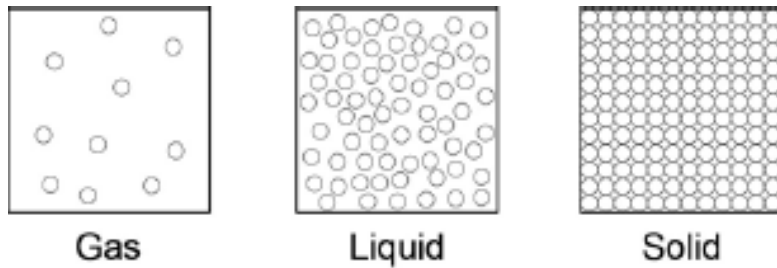


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QUESTION 4 – DENSITY (7 marks)

Density can be explained using the particle model.

The figure below shows particles of the same substance in three states of matter.



4.1 Compare the density of the three states of matter.

2

4.2 Give a reason for your answer to question 4.1.

2



4.3 The volume of an aluminum block is 75 cm^3 .

The mass of the block is 225 g.

Calculate the density of aluminum.

Give the unit.

Use the equation:

$$\text{density} = \text{mass} \div \text{volume}$$

Density = _____

3

Unit = _____

Turn over for the next question.



TURN OVER ►

QUESTION 5 – CHANGES OF STATE (8 marks)

A student made some ice cubes by freezing some water.

5.1 The student froze 26 g of water.

The student weighed the ice after freezing all of the water.

What mass of ice did the student expect to have?

_____ g

1

5.2 The student put some ice in a glass of water.

The student observed that the ice floated on liquid water.

Compare the density of ice to liquid water.

1



5.3 Describe what happens to the arrangement and movement of particles when the water froze.

4

5.4 Explain why the arrangement and movement of particles change in this way

2

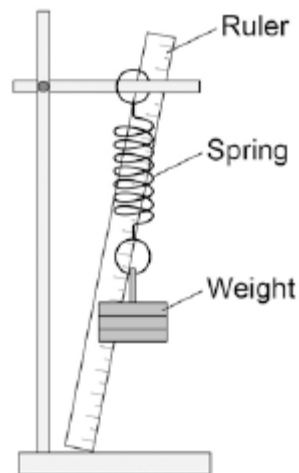
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QUESTION 6 – EXTENSION OF A SPRING (6 marks)

The student used a spring, a set of weights and a ruler to investigate how the extension of the spring depended on the weight hanging from the spring.

The diagram below shows how the student arranged the apparatus.



6.1 Before taking any measurements, the student adjusted the ruler to make it vertical.

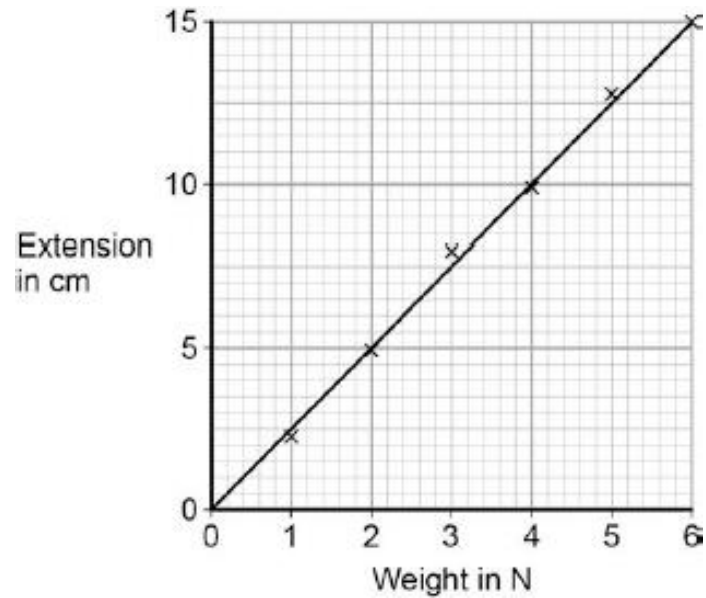
Explain why adjusting the ruler was important.

2



The student measured the extension of the spring using a range of weights.

The student's data is shown plotted as a graph below.



6.2 Describe the relationship between weight and extension.

2

Question 6 continues on the next page.

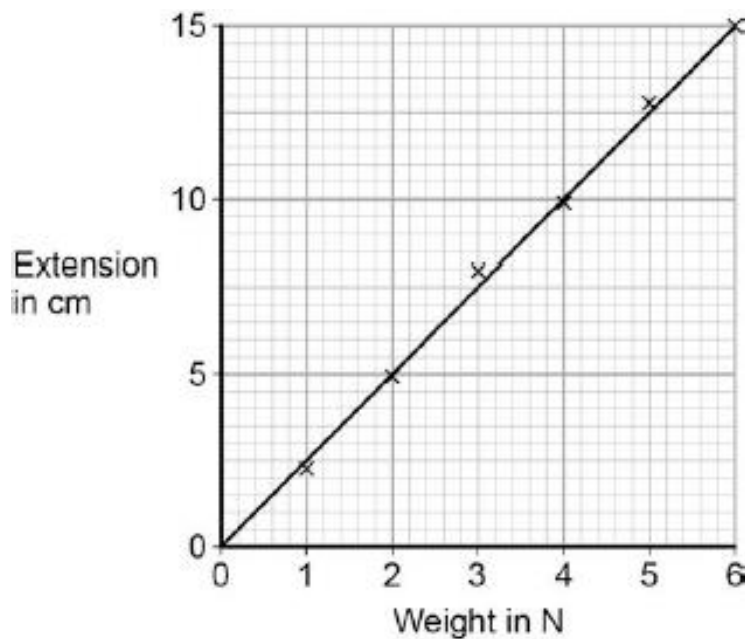


Energy is transferred to a spring when it is extended.

The student repeated the experiment in the same way with a second spring.

The second spring stores **more energy** than the first spring when it is extended by the same distance.

6.3 On the graph below, sketch a line for the second spring.



1

6.4 How does the **spring constant** of the two springs compare?

Tick (✓) **one** box.

Spring constant of second spring is larger

They are the same

Spring constant of second spring is smaller

1

END OF ASSESSMENT



TURN OVER ►

This is the end of the assessment.
There are no questions printed on this page.

