Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Particle Model Of Matter (Low Demand)

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Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Q1.

Figure 1 shows a swimmer wearing a wetsuit.

The wetsuit helps to keep the swimmer warm.

Figure 1

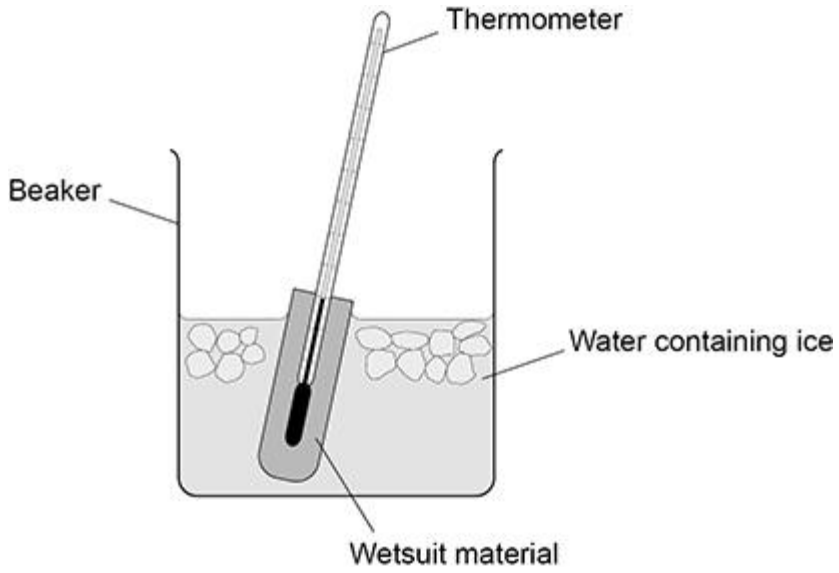


A swimmer wearing a wetsuit © OSTILL / iStock

A student wrapped a thermometer in a piece of wetsuit material and placed the thermometer in water containing ice.

Figure 2 shows the apparatus.

Figure 2



(a) After 30 seconds in the water the temperature of the thermometer had decreased by 7.5 °C

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Calculate the average decrease in temperature each second.

_____

_____

_____

Average decrease in temperature each second = _____ °C

(2)

The student recorded the temperature of the thermometer after 30 seconds for four materials. Each piece of material was the same size and thickness.

In each test the starting temperature of the thermometer was 21.0 °C

Table 1 shows the results.

Table 1

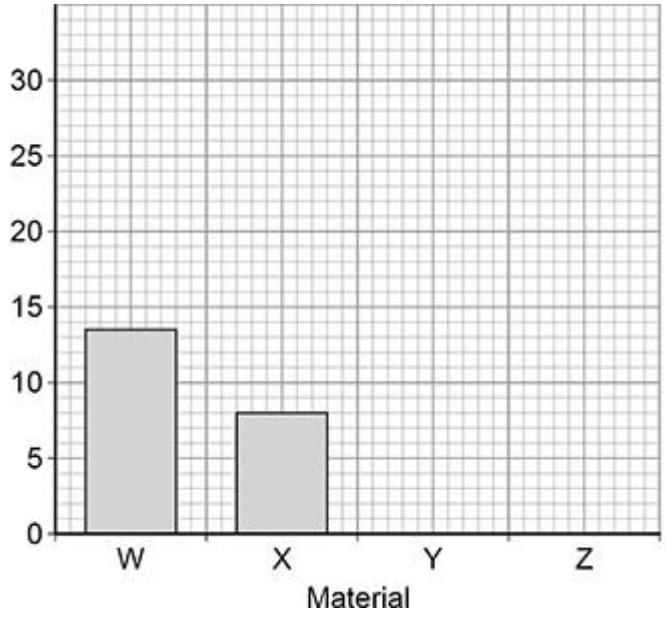
Material	W	X	Y	Z
Temperature in °C	13.5	8.0	16.0	12.0

(b) Complete **Figure 3** using the data in **Table 1**.

You should:

- label the *y*-axis
- draw the bars for materials Y and Z.

Figure 3



(2)

(c) Which material is the best thermal insulator?

Give a reason for your answer.

Tick (✓) **one** box.

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W ☐ X ☐ Y ☐ Z ☐

Reason _____

_____

(2)

(d) The student tested a new material with a greater thermal conductivity than material Z.

The piece of new material was the same size and thickness as the piece of material Z.

What was the temperature of the thermometer after 30 seconds?

Tick (✓) **one** box.

Less than 12.0 °C ☐

Exactly 12.0 °C ☐

Greater than 12.0 °C ☐

(1)

(e) During the investigation 0.0150 kg of the ice melted. The temperature of the water and ice did not change.

specific latent heat of fusion of ice = 334 000 J/kg

Calculate the energy needed to melt the ice.

Use the equation:

energy to melt the ice = mass × specific latent heat

_____

_____

_____

_____

Energy needed to melt the ice = _____ J

(2)

The student wanted to determine the density of a wetsuit material.

The student measured the length of one side of a cube of wetsuit material with:

- a micrometer
- a ruler.

Table 2 shows the results.

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Table 2

Equipment	Length in cm		
	Measurement 1	**Measurement 2**	**Measurement 3**
Micrometer	0.581	0.557	0.576
Ruler	0.6	0.6	0.6

(f) Complete the sentence.

Choose the answer from the box.

calibration	**precision**	**reproducibility**	**resolution**

The results show that compared to the ruler the micrometer has a higher

_____.

(1)

Use the Physics Equations Sheet to answer parts (g) and (h).

(g) Write down the equation that links density (ρ), mass (m) and volume (V).

_____

_____

(1)

(h) The student calculated the volume of the cube of wetsuit material to be 0.186 cm^3

The density of the cube was 0.300 g/cm^3

Calculate the mass of the cube.

Give your answer in grams.

_____

_____

_____

_____

_____

_____

Mass = _____ g

(3)

(Total 14 marks)

Q2.

A student investigated the density of different types of rock.

Figure 1 shows a piece of limestone.

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Figure 1



(a) The student was **not** able to calculate the volume of the piece of limestone using measurements taken with a ruler.

What is the reason?

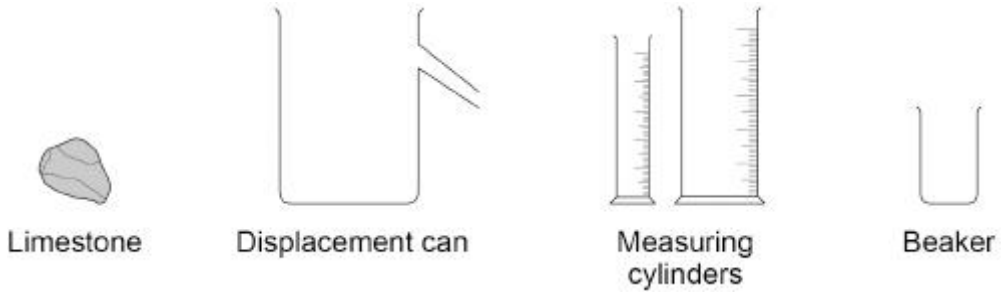
Tick (✓) **one** box.

A ruler is not very accurate.	☐
The piece of limestone has an irregular shape.	☐
There is a large uncertainty when using a ruler.	☐

(1)

(b) **Figure 2** shows some of the equipment given to the student.

Figure 2



Describe a method the student could use to determine the volume of the piece of limestone.

_____

_____

_____

_____

_____

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_____

_____

_____

(4)

(c) The mass of the piece of limestone was 155 g.

The volume of the piece of limestone was 62 cm^3.

Calculate the density of the piece of limestone.

Use the equation:

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

_____

_____

_____

Density = _____ g/cm^3

(2)

(d) Density can be measured in g/cm^3.

What is another unit for density?

Tick (✓) **one** box.

cm/g^3 ☐

kg/m^3 ☐

kg^3/m ☐

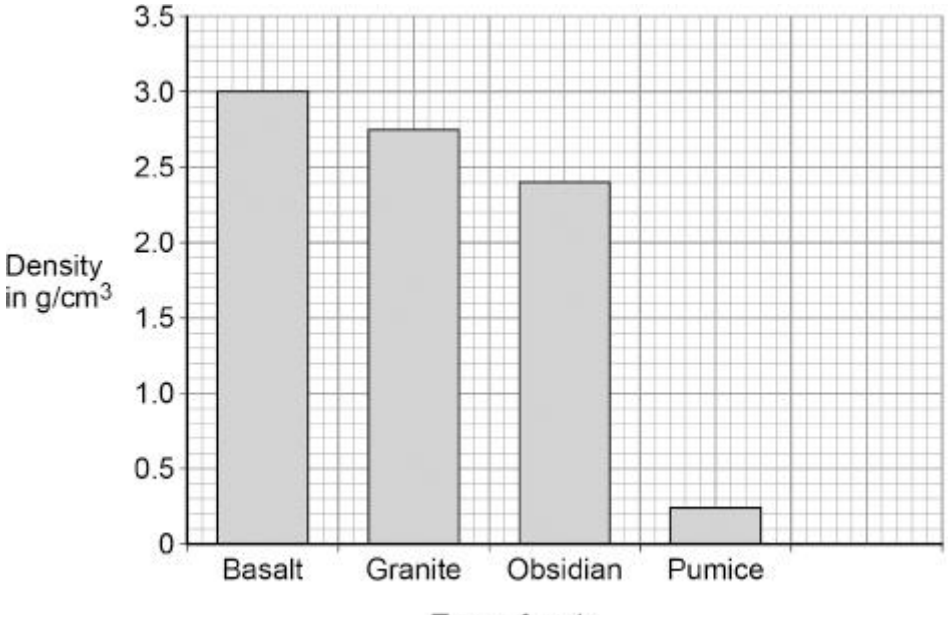
kg^3/cm ☐

(1)

Figure 3 gives the density of some other types of rock.

Figure 3

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The student has a sample of an unknown type of rock.

The density of this rock is 2.4 g/cm^3.

(e) Draw a bar on **Figure 3** to show the density of the unknown type of rock.

(1)

(f) Complete the sentence.

Choose the answer from the box.

basalt	**granite**	**obsidian**	**pumice**

The data in **Figure 3** suggests that the unknown type of

rock is _____.

(1)

(g) The student **cannot** be certain that the unknown type of rock is one of the types of rock in **Figure 3**.

Give a reason why.

_____

_____

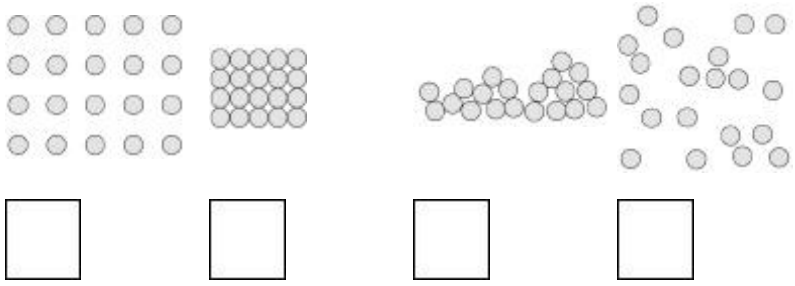
(1)

Pumice is a type of rock that has holes in it. The holes contain air.

(h) Which diagram shows the arrangement of particles in air?

Tick (✓) **one** box.

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(1)

(i) Complete the sentence.

Choose the answer from the box.

less than	**the same as**	**more than**

The holes containing air cause the density of pumice to

be _____ the density of other types of rock.

(1)

(Total 13 marks)

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