

The Particle Model (F)

1. Different states of matter have different densities.

Which of the following shows the states of matter in density order, starting with the lowest density?

- A Solid – liquid – gas
- B Solid – gas – liquid
- C Gas – liquid – solid
- D Liquid – gas – solid

Your answer

[1]

2. A radio wave has a wavelength of 100 m. It has a speed of 3×10^8 m/s.

Use the equation: Wave speed = Frequency \times Wavelength

Calculate the frequency of the wave.

- A 3 MHz
- B 30 MHz
- C 300 MHz
- D 3000 MHz

Your answer

[1]

3. What is the typical size for a small molecule?

- A 0.1 cm
- B 0.1 km
- C 0.1 m
- D 0.1 nm

Your answer

[1]

4. An object has a volume of 1.5 m^3 and a mass of 3.0 kg .

What is the density of the object?

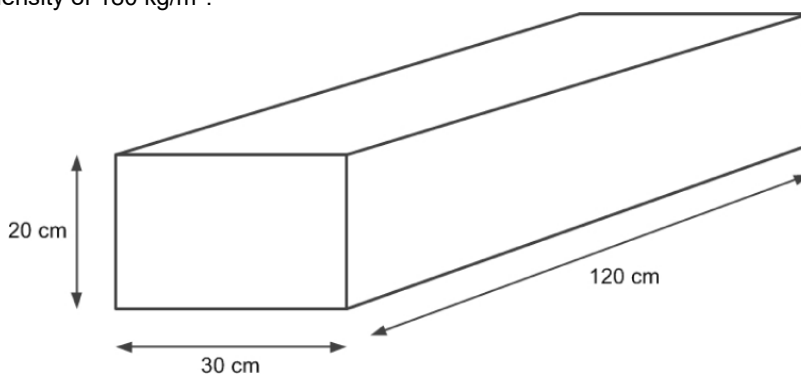
Use the equation: $\text{density} = \text{mass} \div \text{volume}$

- A 0.5 kg/m^3
- B 2.0 kg/m^3
- C 4.5 kg/m^3
- D 6.0 kg/m^3

Your answer

[1]

5. Wood has a density of 180 kg/m^3 .



Calculate the mass of this piece of wood.

Show your working and give the units.

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answer: units:..... [6]

6. Atomic models have changed over time.

Old atomic model – Atoms are a positive mass with negative electrons fixed in it.

Current atomic model – Atoms are made from protons, neutrons and electrons. Protons and neutrons are in a central nucleus surrounded by a cloud of electrons.

i. Write down **two** differences between these models.

1

2

[2]

ii. Why did the atomic model change?

[2]

7 (a). Complete the sentences about an atom.

Use words from the list.

You may use each word once, more than once, or not at all.

- | | | | |
|----------------|------------------|-------------------|-----------------|
| Atom | Electrons | Negatively | Neutrons |
| Nucleus | Orbits | Positively | Protons |

An atom has a charged nucleus surrounded by
charged electrons.

The nucleus contains protons and

Almost all of the mass of an atom is in the

[4]

(b).

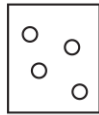
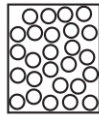
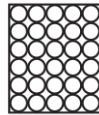
i. A swimming pool contains 9970 kg of water in 10 m³.

Calculate the density of water.

Use the equation: density = mass ÷ volume

Density = kg / m³ [1]

ii. The diagrams, **A**, **B** and **C**, show the particles in three states of matter.

**A****B****C**

Write the letters in the boxes to give the correct order of density, from **most** to **least dense**.

Most dense \longrightarrow **Least dense**

[1]

iii. Explain why you chose the order in (ii).

----- [1]

END OF QUESTION PAPER