

CHAPTER

3

Mass, Weight and Density

Exercise 3A

Mass and Weight

- 1 Use the words given to fill in the blanks in the sentences. Use each word once, more than once or not at all.

gram kilogram mass newton volume weight

- (a) The measure of the quantity of matter in an object is called _____.
- (b) Two units of mass are the _____ and the _____.
- (c) The amount of space an object occupies is called its _____.
- (d) The gravitational force on an object is called its _____.
- (e) The unit of weight is the _____.
- (f) The effect of a gravitational field on an object is the _____ of the object.
- 2 Draw one or more lines to match each quantity to be measured to the measuring instrument required.

Quantity	Measuring instrument
Mass	Beam balance
Volume	Electronic balance
Weight	Measuring cylinder
	Spring balance

- 3 Draw a ring around the correct equation connecting gravitational field strength g , weight W and mass m .

$g = mW$ $g = \frac{m}{W}$ $g = \frac{W}{m}$ $g = \frac{m^2}{W}$ $g = m^2W$

For questions 4 to 6, $g = 9.8 \text{ N/kg}$ on the Earth and $g = 1.6 \text{ N/kg}$ on the Moon.

- 4 Calculate the weight of these objects on the Earth and on the Moon. Give your answers to 2 significant figures.
- (a) 5 kg rock

weight on the Earth = _____ N
weight on the Moon = _____ N

(b) 400 g rock

weight on the Earth = _____ N

weight on the Moon = _____ N

- 5 Complete Table 3.1 to show the mass and weight of the food in a packet that an astronaut brings on a journey from the Earth to the Moon.

Table 3.1

Contents of food packet	Mass/kg	Weight/N
On the Earth	0.5	
In space where there is no gravitational field		
On the Moon		

- 6 Figure 3.1 shows a beaker placed on an electronic balance when it is empty and when it contains a chemical. Calculate the mass and the weight of the chemical on the Earth.

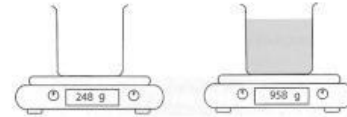


Figure 3.1

mass = _____ kg
weight = _____ N

Exercise 3B

Density

- 1 Fill in the blanks in the sentences.

- (a) The density of a substance is its _____ per unit _____.
- (b) Density is measured in kg/m^3 or g/cm^3 , where 1 kg/m^3 is equal to _____ g/cm^3 .

For questions 2 to 4, choose the correct answer and write your choice in the brackets.

- 2 Which is the correct equation for calculating density ρ , where W = weight, m = mass and V = volume?

A. $\rho = \frac{m}{V}$ B. $\rho = \frac{V}{m}$
C. $\rho = \frac{W}{V}$ D. $\rho = \frac{V}{W}$

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