FREE REVISION PACK

Density & Upthrust

Pearson Edexcel International Advanced Level Physics · Unit 1 (WPH11) · Specification points 23–24

Easy | Medium | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Archimedes' principle	Edexcel IAL June 2025 · Unit 1 · Q1	1 mark
2	Easy	Density from weight and volume	Edexcel IAL June 2021 · Unit 1 · Q2	1 mark
3	Easy	Side of a cube from its weight and density	Edexcel IAL January 2024 · Unit 1 · Q8	1 mark
4	Easy	Comparing densities of two cubes	Edexcel IAL January 2019 · Unit 1 · Q10	1 mark
5	Medium	Force needed to fully submerge a floating sphere	Edexcel IAL June 2019 · Unit 1 · Q3	1 mark

Key ideas to have ready

- Density ρ = m/V (kg m^{-3}); use mass, so divide a weight by g first.
- Archimedes: upthrust = weight of fluid displaced.
- A floating object displaces its own weight of fluid.
- Scaling a shape by k multiplies its volume by k^3.

How to use this pack

1. The questions are grouped into levels (Easy and Medium). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in Pearson's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–4

Choose **one** answer for each question and put a cross in the box next to it.

Edexcel IAL June 2025 · Unit 1 · Q1

1 A cube of volume V is placed in a liquid of density ρ. The cube displaces a weight W of the liquid.

Which of the following gives the magnitude of the upthrust acting on the cube?

- ☒ **A** $V \times W$
- ☒ **B** V
- ☒ **C** $V \times \rho$
- ☒ **D** W

Edexcel IAL June 2021 · Unit 1 · Q2

2 A cylinder of aluminium has a weight of 35.0 N and a volume of $1.32 \times 10^{-3}\,\text{m}^3$.

Which of the following calculations gives the density of aluminium in kg m^{-3}?

- ☒ **A** $\dfrac{9.81 \times 1.32 \times 10^{-3}}{35.0}$
- ☒ **B** $\dfrac{1.32 \times 10^{-3}}{35.0 \times 9.81}$
- ☒ **C** $\dfrac{35.0}{9.81 \times 1.32 \times 10^{-3}}$
- ☒ **D** $\dfrac{35.0 \times 9.81}{1.32 \times 10^{-3}}$

Edexcel IAL January 2024 · Unit 1 · Q8

3 A solid cube of weight W is made from material with density ρ.

Which expression gives the length of each side of the cube?

☒ **A** $\left(\frac{\rho g}{W}\right)^3$

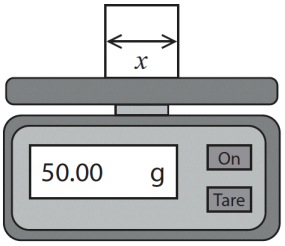
☒ **B** $\sqrt[3]{\frac{\rho g}{W}}$

☒ **C** $\left(\frac{W}{\rho g}\right)^3$

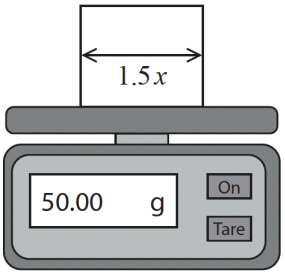
☒ **D** $\sqrt[3]{\frac{W}{\rho g}}$

Edexcel IAL January 2019 · Unit 1 · Q10

4 A student used a balance to measure the mass of a small cube with sides of length x.



The student also measured the mass of a larger cube with sides of length $1.5x$.



Which of the following is the density ρ_L of the larger cube in terms of the density ρ_S of the smaller cube?

☒ **A** $\rho_L = 3.4\rho_S$

☒ **B** $\rho_L = 1.5\rho_S$

☒ **C** $\rho_L = 0.67\rho_S$

☒ **D** $\rho_L = 0.30\rho_S$

Medium Two or three steps. Roughly a third to a half of students get these right. **Question 5**

Edexcel IAL June 2019 · Unit 1 · Q3

5 A sphere of weight 2.5 N floats in water with ½ of its volume beneath the surface.

A force F is applied to the sphere, completely immersing it in the water as shown.



Which of the following is the minimum value of F?

☒ **A** $2 \times 2.5\,\text{N}$

☒ **B** $1 \times 2.5\,\text{N}$

☒ **C** $\frac{1}{2} \times 2.5\,\text{N}$

☒ **D** $\frac{1}{4} \times 2.5\,\text{N}$

End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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