

What air is made of and why it presses

Grade 7 science (Year 8 · Class 7) · Test answers (mark scheme)

Use these model answers with the marking notes. Give method marks when the substitution is correct even if the final number is wrong, and check that every pressure answer has the correct unit: Pa, kPa or hPa.

Level: Grade 7 science (Year 8 · Class 7) · **Curriculum:** MS-ESS2-5

Question 1 Composition of air (3 marks)

- a. **Nitrogen.**
- b. About **21 %**.
- c. Argon or carbon dioxide (or water vapour).

Marking: 1 mark each.

Question 2 Evidence for mass (2 marks)

The inflated ball has a **greater mass** than the flat ball. The extra mass is the mass of the air added, so air has mass.

Marking: 1 mark for the greater mass of the inflated ball, 1 mark for the conclusion that air has mass.

Question 3 Air in a hall (3 marks)

- a. $V = 5.0 \times 4.0 \times 2.5 = \mathbf{50\ m^3}$.
- b. $m = \rho \times V = 1.2 \times 50 = \mathbf{60\ kg}$.

Marking: (a) 1 mark; (b) 1 mark for the substitution, 1 mark for the answer with unit.

Question 4 Pressure calculation (3 marks)

- a. $p = F \div A = 480 \div 0.40 = \mathbf{1200\ Pa}$.
- b. $1200 \div 1000 = \mathbf{1.2\ kPa}$.

Marking: (a) 1 mark for the substitution, 1 mark for the answer with unit; (b) 1 mark.

Question 5 Reading a barometer (3 marks)

- a. **752 mm.**
- b. A **vacuum** (no air).

- c. The pressure of the atmosphere pushing on the mercury in the dish.

Marking: 1 mark each part.

Question 6 Pressure on a mountain (3 marks)

- a. There is **less air above** a climber at the top, so the weight of the air column is smaller. The air is also less dense.
b. The column becomes **shorter**.

Marking: (a) 1 mark for less air above, 1 mark for smaller weight or lower density; (b) 1 mark.

Question 7 Converting pressure (2 marks)

$1020 \times 100 = \mathbf{102\ 000\ Pa}$, and $102\ 000 \div 1000 = \mathbf{102\ kPa}$.

Marking: 1 mark for pascals, 1 mark for kilopascals.

Question 8 Unit of pressure (1 mark)

1 Pa = 1 N/m² (one newton on one square metre).

Marking: 1 mark.