

Measuring acidity with the pH scale

Grade 8 science (Year 9 · Class 8) · Test answers (mark scheme)

Marks are shown in each model answer. Accept any correct equivalent wording, and give error-carried-forward credit for later parts when the method is right.

Level: Grade 8 science (Year 9 · Class 8) · **Curriculum:** MS-PS1-2

Question 1 Indicators (2 marks)

- a. Red.
- b. Green.

Marking: 1 mark each.

Question 2 Reading the scale (3 marks)

- a. R (pH 7).
- b. P (pH 1).
- c. S (pH 12).

Marking: 1 mark each.

Question 3 Dilution by 100 (2 marks)

- a. Factor 100 raises the pH by 2, so the new pH is **5**.

Marking: 1 mark for the rise of 2, 1 mark for the answer 5.

Question 4 Comparing acidity (3 marks)

- a. 3 steps, so $10 \times 10 \times 10 =$ **1000 times**.
- b. Both are **acidic**, since each pH is below 7.

Marking: 1 mark for 3 steps, 1 for 1000; 1 mark for acidic.

Question 5 Why not alkaline? (3 marks)

- a. Water is neutral with pH 7. Dilution spreads the acid out, so the pH moves up towards 7. The acid becomes weaker but the water cannot make it more basic than neutral, so the pH **never goes above 7**.

Marking: 1 mark water is neutral; 1 mark pH approaches 7; 1 mark never passes 7.

Question 6 Safe working (2 marks)

- a. Wear **goggles** and add the acid slowly to the water, never water to acid.

Marking: 1 mark each; accept gloves, tell the teacher, rinse splashes.

Question 7 Neutralisation (2 marks)

- a. **Hydrochloric acid + sodium hydroxide → sodium chloride + water.**

Marking: 1 mark for reactants, 1 mark for products.

Question 8 Dilution plan (3 marks)

- a. pH rises by 2, so the factor is **100**.
b. $40 \text{ mL} \times 100 = \mathbf{4000 \text{ mL}}$.
c. $4000 - 40 = \mathbf{3960 \text{ mL}}$.

Marking: 1 mark for each part; allow error carried forward.