Acids, bases and salts: diagnostic review

Student activity • desk-based review

YEAR 10 / LESSON 58 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

The question

Can you choose and explain the correct salt-preparation route?

Complete an original shared-core diagnostic, explain your errors and choose a focused next step. Chemistry-only titration and precipitation questions are marked separately.

Equipment

- Booklet, calculator, periodic table and previous corrected notes
- No chemicals or laboratory equipment

No laboratory reagents or heating. Written references to lead compounds do not authorise a pupil experiment.

Course coverage: Shared review: 2.28–2.32 and 2.34–2.39/2.42. Questions 5–6 are Chemistry-only extensions (2.33C, 2.40C–2.41C/2.43C).

Plan, model or apparatus sketch

Draw a salt-preparation decision chart; label Chemistry-only branches.

Method and reasoning

Read the whole sequence before starting

YEAR 10 / LESSON 58 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

1. Work independently on shared-core questions 1–4 before consulting notes. Show equations and reasons, not just keywords.

2. Use the evidence grid to record your answer, confidence and correction for each question. Do not erase the original answer.

3. Chemistry-only learners then complete questions 5–6. Shared-core learners instead improve a copper sulfate preparation flowchart and explain each separation step.

4. Compare your reasoning with the teacher guidance. Label each error as a vocabulary, equation, evidence or method-selection error.

5. Rewrite one weak answer completely and explain why your original was incomplete or incorrect.

6. Finish with an exit ticket: explain why “insoluble”, “neutral”, “pure” and “dry” mean different things. Choose one specific revision action.

Cleanup

- Keep corrected answers and return shared materials.

Record your evidence

Blank spaces are for your own work

YEAR 10 / LESSON 58 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Reference and task data

Original practice prompts, not copied examination questions. Shared-core route: questions 1–4. Chemistry-only extension: questions 5–6. For Q5 only, invented accurate titres are 19.60, 19.65 and 20.30 cm^3. For Q6, the two aqueous reactants are $Pb(NO_3)_2$ and Na_2SO_4; this is a written task, not another practical.

Question	Answer / confidence	Correction and reason
1		
2		
3		
4		
5		
6		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

YEAR 10 / LESSON 58 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

1. A solution makes methyl orange yellow and phenolphthalein colourless. Must it be neutral? Explain using the indicators' ranges.

2. Correct the claim "all bases are soluble hydroxides"; give an insoluble base and explain ammonia as a proton acceptor.

3. Plan pure, dry hydrated copper sulfate from CuO and dilute H_2SO_4. Explain excess CuO, filtration, concentration, cooling and drying.

4. Write balanced equations for HCl with MgO and $CaCO_3$. Explain what fizzing does and does not prove about a gas.

5. Chemistry only: select and average the concordant invented titres. Explain how these results can make pure sodium chloride without indicator contamination.

6. Chemistry only: write the full and net ionic equations for lead sulfate precipitation. Explain washing, drying and collection of all lead-containing waste.