Bonding and structure exam practice

Teacher / technician

YEAR 10 / LESSON 26 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Original exam-style task, 20 suggested classroom marks. Invented property cards; no official paper, grade boundary or experimental result.

Coverage and delivery

Shared-core consolidation of ionic and covalent bonding, structure–property explanations, molecular phase changes and carbon allotropes. No metallic-bonding explanation required.

Allow about 50 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Student booklet	1 per student	30
Writing tools / blank paper	1 set per student	30 sets
Periodic table	1 per pair	15
Correction pen	1 per student	30

Immediate safety

Desk activity only. Use pre-cut blunt modelling pieces and keep small parts out of mouths. Keep the workspace clear; no chemicals, flames or electrical supply are required.

Preparation and delivery

Read alongside the student method

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1. Print 30 student sheets and retain the staff guide until marking. Allow 25 minutes for the timed task, 15 for feedback and 10 for improvement/exit work.

2. The 20 marks are suggested classroom marks for original questions, not official Pearson scoring or grade boundaries. Accept scientifically equivalent phrasing and rotated diagrams.

3. Property cards are invented qualitative patterns. A suggests ionic structure; B suggests simple molecular; C suggests graphite. Require reasoning and acknowledge that properties alone are not a unique chemical identification.

4. Before marking Q3 distinguish ion formation from attraction. Before marking Q5 distinguish covalent bonds within molecules from intermolecular attractions. Do not count the same scientific point twice.

Close of lesson

• Keep your evidence and corrections. Count and return reusable model pieces; recycle unwanted paper. No chemical waste is produced.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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• Q1 (3): ionic structure (1); ions fixed in solid so no mobile charge carriers (1); mobile ions carry charge in the melt (1).

• Q2 (3): simple molecular (1); relatively weak intermolecular attractions (1); little energy needed to overcome them/separate molecules (1). Do not credit “weak covalent bonds”.

• Q3 (4): one Mg^{2+} and two Cl^{-} in brackets with charges (1); each chloride has an octet (1); each includes one transferred electron with consistent dot/cross origins (1); +2 balances two −1 charges (1). Inner shells may be omitted.

• Q4 (3): two shared O–H pairs (1); two lone pairs on O, no extra electrons on H (1); attraction between positive nuclei and the shared negative electron pair (1).

• Q5 (3): I_2 has more electrons/larger electron cloud (1); stronger intermolecular attractions (1); more energy required to separate molecules, with covalent bonds intact (1).

• Q6 (4): graphite (1); layers can slide because interlayer attractions are weaker than bonds within sheets (1); delocalised electrons (1) can move along sheets to carry charge (1). Total 20. Exit: different bonding/arrangements give different electron mobility.

References and provenance

Pearson Chemistry specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.