Reactivity trend of Group 1 metals

Teacher / technician

YEAR 10 / LESSON 19 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Theory follow-up to Lesson 18. Shared-core trend/prediction plus an explicitly optional Chemistry-only explanation; no new experiment.

Coverage and delivery

Shared core 2.2–2.3: describe the air/water trend and predict properties of other Group 1 metals. Chemistry-only extension 2.4C: explain the trend using electronic configurations.

Allow about 45 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
Periodic table and writing tools	1 set per pair	15 sets
Lesson 18 evidence record	1 per student	30 records

Immediate safety

Desk activity only. No chemical samples or live reactions. Keep counters out of mouths and return loose pieces; use pencil symbols instead if preferred.

Preparation and delivery

Read alongside the student method

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1. Retain or redistribute the Lesson 18 evidence tables; no repeat demonstration is needed. Where pupils missed Lesson 18, label any supplied evidence as a teacher reference rather than their observation.

2. Teach questions 1–4 and 6 to both courses. Clearly announce and label Question 5 and the electron-shell explanation as Chemistry-only 2.4C. Do not require it in Double Award marking.

3. Allow 10 minutes for retrieval, 15 for evidence/prediction, 10 for limits and 10 for extension or shared-core consolidation. For Double Award, use the extension time to improve evidence-based predictions.

4. Emphasise that a qualitative trend does not give a numerical rate law. Do not suggest a rubidium or caesium classroom test. No chemicals or apparatus are requisitioned.

Close of lesson

• Keep evidence and corrections together. Return shared cards/counters and equipment; close the recording or reference pages. No chemical waste is generated.

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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• Shared core: reactivity increases down Group 1, with Li < Na < K. Link to actual recorded evidence; the films do not establish an exact rate ratio.

• Rubidium is predicted to react more vigorously with water than potassium and form rubidium hydroxide and hydrogen. This is an inference from group behaviour, not a class observation.

• Twice-as-fast is unsupported: no controlled timing, matching sample sizes or numerical rate measurements are supplied.

• Chemistry-only: all have one outer electron. Down the group more occupied shells increase distance and shielding; these effects outweigh the extra nuclear charge for that electron. Attraction weakens overall and electron loss becomes easier.

• Do not say nuclear charge decreases, or that all electrons become easier to remove. The explanation concerns the outer electron in these atoms.

• Replace an unobserved flame claim with “not seen in this clip”. Expected reference behaviour may be added separately and labelled. Double Award answer checking excludes Question 5.

References and provenance

Pearson Chemistry specification

RSC: evidence source from Lesson 18

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.