Using electron arrangements

Teacher / technician

YEAR 10 / LESSON 11 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Desk comparison only. No observed reaction or measured reactivity trend is claimed.

Coverage and delivery

1.22–1.24: electronic configuration, main-group position, similar properties and noble-gas reactivity.

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	1 per pair	15
Pencil / ruler / correction pen	1 set per student	30 sets
Six configuration cards	1 set per pair	15 sets / 90 cards

Immediate safety

Desk activity only. Use pre-cut cards or reusable counters; keep small pieces out of mouths and off the floor. No chemicals, flames, glassware or radiation sources are required.

Preparation and delivery

Read alongside the student method

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1. Supply one configuration-card set per pair and periodic tables. Cards can be cut from a photocopy of the task-data table; no chemical samples are required.

2. Use 10 minutes for identification, 10 for sorting, 10 for noble-gas explanations and 15 for prediction and correction.

3. Keep the model restricted to neutral atoms and main-group examples. Compare occupied-shell count with period, not group. Challenge “every noble gas has eight outer electrons”.

Close of lesson

• Count and return cards or counters. Keep your written work and corrections; recycle unwanted paper.

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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- A is lithium, Z = 3, Period 2, Group 1. B is sodium, Z = 11, Period 3, Group 1. Each has one outer electron.
- C is fluorine, Z = 9, Period 2, Group 7. D is chlorine, Z = 17, Period 3, Group 7. Each has seven outer electrons.
- E is helium, Z = 2, Period 1, Group 0. F is neon, Z = 10, Period 2, Group 0. Both have full outer shells in the course model.
- Full outer shells make the noble gases comparatively unreactive: they do not readily gain, lose or share electrons. Do not claim noble-gas compounds can never exist.
- 2,8,8,1 totals 19: potassium, Period 4, Group 1.
- Same-group elements have similar chemical properties because of related outer-electron arrangements. Their occupied-shell counts differ down the group and physical properties need not match.

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.