The periodic table

Teacher / technician

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

Staff preparation and answer guidance. Keep separate from student sheets. Theory and models only. The previous unrelated acid-reaction method is removed. No physical investigation is claimed.

Coverage and delivery

1.18–1.19: atomic-number order, groups, periods and electron arrangements of the first twenty elements.

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
Twenty-element card set	1 set per pair	15 sets / 300 cards
Electron counters (or pencil dots)	20 per pair	300 (or paper)

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. Print and pre-cut the supplied twenty-card set per pair. Symbols and atomic numbers are supplied; learners must deduce arrangements and positions. A standard periodic table is the checking reference.

2. Allow 10 minutes for card ordering, 15 minutes for shell arrangements, 10 minutes for group/period comparisons and 10 minutes for explanations.

3. Remove the earlier metals-and-acid requisition and warming/gas-testing method from this lesson. They do not support this lesson's stated scope and are not retained as an optional experiment.

4. Use course group labels consistently. Mention the helium exception explicitly and limit the 2,8,8,2 filling model to the first twenty neutral atoms.

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 group is a vertical column and a period a horizontal row. For the main-group examples here, outer electrons link to group and occupied shells to period.

• Rows: Li 2,1 / Period 2 / Group 1; C 2,4 / Period 2 / Group 4; Ne 2,8 / Period 2 / Group 0; Na 2,8,1 / Period 3 / Group 1; K 2,8,8,1 / Period 4 / Group 1; Ca 2,8,8,2 / Period 4 / Group 2.

• Potassium has four occupied shells and one outer electron. Carbon totals 6 electrons, sodium 11 and calcium 20.

• Helium’s first shell is full with two electrons. Group 0 elements have full outer shells in this model; “all have eight” is incorrect.

• Proton number defines element identity. Magnesium has 12 protons; changing neutron count makes an isotope, not a new element.

• The diagram does not depict fixed circular electron paths or actual scale. Beyond the first twenty, a simple 2,8,8,2 capacity rule is not adequate.

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.