

Exercise walk-through

Arrangement of elements ■ 8.1

eXercise

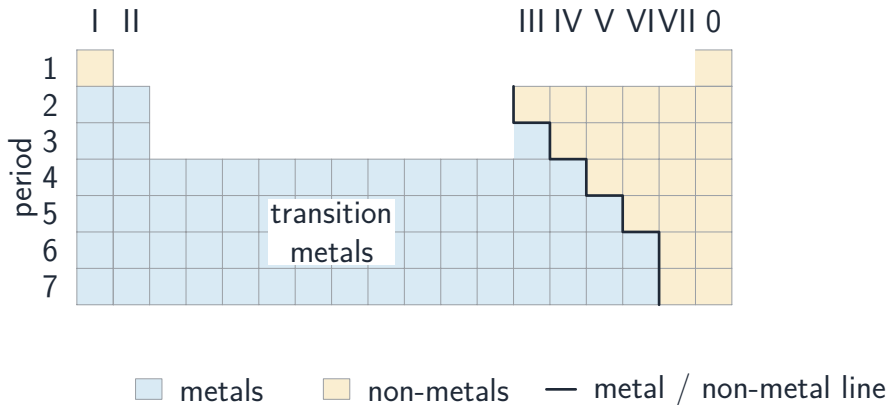
You must be able to

- describe the order (increasing proton number) and what groups/periods are
- link group number to ion charge and outer electrons
- explain why elements in a group have similar properties

Method — Reading the Periodic Table

- order = increasing proton number.
- **group number = outer-shell electrons = ion charge** (Group I $\rightarrow +1$, Group VII $\rightarrow -1$).
- same group $\rightarrow$ same outer electrons $\rightarrow$ similar properties.

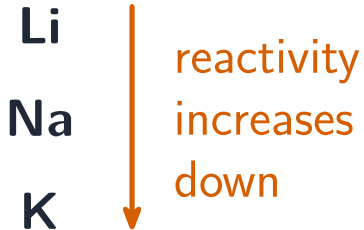
Method — Reading the Periodic Table



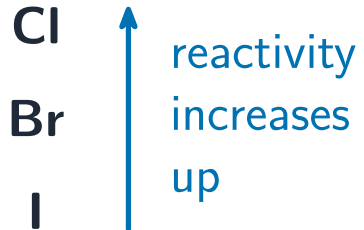
A schematic Periodic Table: groups (columns), periods (rows), metals left of the staircase

Method — Reading the Periodic Table

Group I



Group VII



Trends in properties across groups and periods

Practice 2.1 ■ 1 mark

State what the elements are arranged in order of.

Solution 2.1

Worked steps

increasing proton number (atomic number) **B1**.

Practice 2.2 ■ 1 mark

State the charge of the ion formed by a Group II element.

Solution 2.2

Method: Reading the Periodic Table

Worked steps

+2 **B1**.

Exam-style 3.1 ■ 1 mark

Elements in the same group have similar chemical properties because they have the same:

- A** number of shells
- B** number of outer-shell electrons
- C** mass number
- D** number of neutrons

Solution 3.1

Method: Reading the Periodic Table

- A number of shells
- B number of outer-shell electrons**
- C mass number
- D number of neutrons



Worked steps

B. Same number of outer-shell electrons gives similar properties.

Exam-style 3.2 ■ 1 mark

An element is in Group VII, Period 3.

- (a) State the number of outer-shell electrons it has.
- (b) State the charge of the ion it forms.

Solution 3.2

Method: Reading the Periodic Table

Worked steps

(a) 7 **B1**.

(b) -1 **B1**.

Exam-style 3.3 ■ 2 marks

Explain how the Periodic Table lets you predict an element's properties.

Solution 3.3

Method: Reading the Periodic Table

Worked steps

elements in the same group have similar properties **M1**; so from its position you can predict how it reacts and trends in its group **A1**.