9 Periodicity (Period 3) – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
Periodic Table			
Periodicity			
atomic radius			
nuclear charge			
shielding			
giant metallic			
giant covalent			
simple molecular			
melting point			

Recall

At IGCSE you used the **Periodic Table** . Now we look closely at one row – **Period 3** (Na to Ar) – and see its properties change in a regular pattern.

- **Periodicity** means properties repeat across each period.
- The pattern follows from the structure and bonding of each element.

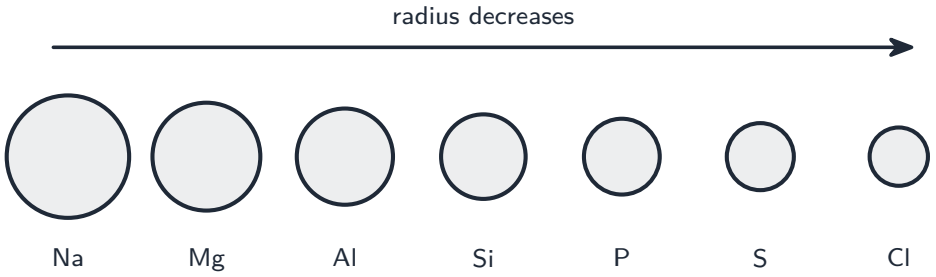
Nothing here is harder than IGCSE – it just lines up one row carefully.

New ideas

Read these first, then do the Practice.

■ 1 Atomic radius

Across Period 3 the **atomic radius** gets **smaller**. The **nuclear charge** rises (more protons), but the outer electrons go into the same shell with similar **shielding**, so they are pulled in tighter.

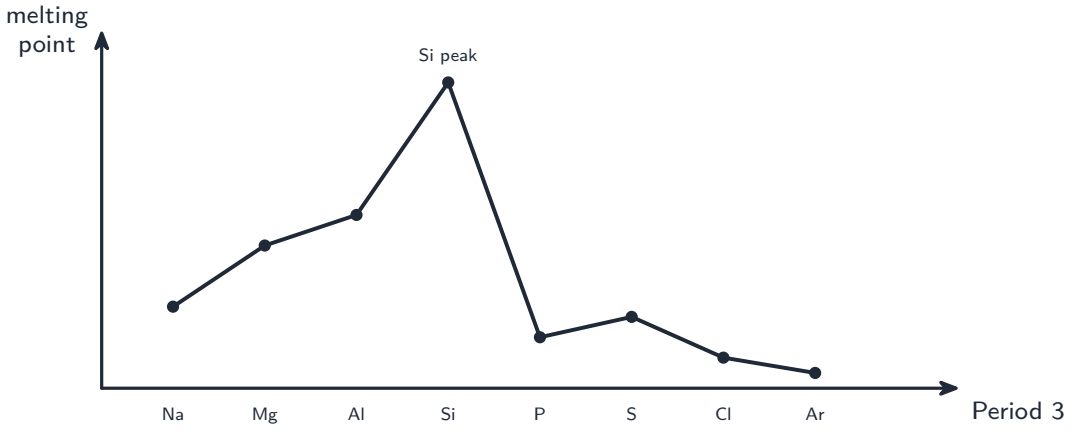


■ 2 Structure across the period

Elements	Structure	Melting point	Conducts?
Na, Mg, Al	**giant metallic**	high, rising	yes
Si	**giant covalent**	highest	no
P, S, Cl, Ar	**simple molecular**	low	no

■ 3 Melting point

The **melting point** rises through the metals, peaks at **silicon** (strong covalent bonds to break), then drops sharply for the simple molecular elements (only weak forces break).



Watch out: across a period the atomic radius gets *smaller* (more nuclear charge,

same shell). Down a *group* it gets *bigger* (extra shells are added). Don't mix up the two trends.

Practice

Try these in order.

9.1 What is meant by *periodicity*? [1]

9.2 Describe and explain the trend in atomic radius across Period 3. [2]

9.3 Name the type of structure of (a) magnesium, (b) silicon, (c) sulfur. [3]

9.4 Silicon has the highest melting point in Period 3. Explain why. [2]

9.5 Why do sulfur and chlorine have low melting points? [2]

9.6 Challenge. Sodium has a larger atomic radius than chlorine, even though both are in Period 3. Explain why. [2]