

The Periodic Table: development and modern layout

Q1 a). (2019)

This question is about the periodic table.

In the 19th century, some scientists tried to classify the elements by arranging them in order of their atomic weights.

Figure 1 shows the periodic table Mendeleev produced in 1869.

His periodic table was more widely accepted than previous versions.

Figure 1

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Period 1	H						
Period 2	Li	Be	B	C	N	O	F
Period 3	Na	Mg	Al	Si	P	S	Cl
Period 4	K Cu	Ca Zn	* *	Ti *	V As	Cr Se	Mn Br
Period 5	Rb Ag	Sr Cd	Y In	Zr Sn	Nb Sb	Mo Te	* I

The atomic weight of tellurium (Te) is 128 and that of iodine (I) is 127

Why did Mendeleev reverse the order of these two elements?

[1 mark]

Q1. b). (2019)

Mendeleev left spaces marked with an asterisk *

He left these spaces because he thought missing elements belonged there.

Why did Mendeleev's periodic table become more widely accepted than previous versions?

[3 marks]

Q1. c). (2019)

Mendeleev arranged the elements in order of their atomic weight.

What is the modern name for atomic weight?

[1 mark]

Tick (✓) **one** box.

Atomic number

☐

Mass number

☐

Relative atomic mass

☐

Relative formula mass

☐

Q2. (2019)

Complete the sentence.

[1 mark]

In the modern periodic table, the elements are arranged in order of

_____.

Q3. (2019)

Ammonia reacts with oxygen in the presence of a metal oxide catalyst to produce nitrogen and water.

Which metal oxide is most likely to be a catalyst for this reaction?

[1 mark]

Tick (✓) **one** box.

CaO

☐

Cr₂O₃

☐

MgO

☐

Na₂O

☐

Q4. (2020)

This question is about metals and the reactivity series.

Which **two** statements are properties of most transition metals?

[2 marks]

Tick (✓) **two** boxes.

They are soft metals.

☐

They form colourless compounds.

☐

They form ions with different charges.

☐

They have high melting points.

☐

They have low densities.

☐

Q5. (2021)

What is the most likely formula of a gallium ion?

[1 mark]

Tick (✓) **one** box.

Ga^+

☐

Ga^-

☐

Ga^{3+}

☐

Ga^{3-}

☐

Q6. (2021)

Gallium was discovered six years after Mendeleev published his periodic table.

Give **two** reasons why the discovery of gallium helped Mendeleev's periodic table to become accepted.

[2 marks]

1 _____

2 _____

Q7. (2023)

Tennessine was first identified by a small group of scientists in 2010.

Suggest **one** reason why tennessine was **not** accepted as a new element by other scientists until 2015.

[1 mark]

Q8. (2023)

Phosphorus (P) is the element below nitrogen in the periodic table.

Predict the formula of the compound formed between phosphorus and hydrogen.

[1 mark]

Formula = _____

Q9. (2023)

Tellurium is the element with atomic number 52

Predict whether tellurium reacts with metals.

Explain your answer.

Answer in terms of the position of tellurium in the periodic table.

[2 marks]
