



Answer all the questions below then check your answers

1. Who is credited with developing the first periodic table?

- A) Henry Moseley B) Dmitri Mendeleev
C) John Dalton D) Frederick Soddy

2. How are the elements arranged in the modern periodic table?

- A) The number of electrons present B) Atomic number
C) The number of neutrons present D) Mass number

Fill in the Blanks

3. The elements in the periodic table are arranged in order of increasing _____.

4. Elements in the same group have similar chemical properties because they have the same number of _____ in their outer shell.

5. The horizontal rows in the periodic table are called _____.

6. Explain why Mendeleev had to swap iodine and tellurium in his periodic table.

7. Why do elements in the same group have similar chemical properties?

8. The table below shows the atomic number and atomic mass of four elements:

Element	Atomic Number	Atomic Mass
X	17	35.5
Y	18	40.0
Z	19	39.1

a. Use the periodic table to identify the elements X, Y, and Z.

b. Which element is a noble gas? Explain your choice.

9. Describe how the modern periodic table is organised and explain how this differs from Mendeleev's original periodic table.

10. Identify the scientist responsible for each of the following:

A) Discovered noble gases and added a new group to the periodic table.

B) Discovered isotopes, explaining atomic mass anomalies.

C) Developed the first periodic table, arranging elements by atomic mass.

D) Rearranged the periodic table by atomic number using X-ray data.

Answers:

1. Who is credited with developing the first periodic table?

- A) Henry Moseley B) Dmitri Mendeleev
C) John Dalton D) Frederick Soddy

Answer: B) Dmitri Mendeleev

2. How are the elements arranged in the modern periodic table?

- A) The number of electrons present B) Atomic number
C) The number of neutrons present D) Mass number

Answer: B) Atomic number

Fill in the Blanks

3. The elements in the periodic table are arranged in order of increasing _____.

Answer: atomic number

4. Elements in the same group have similar chemical properties because they have the same number of _____ in their outer shell.

Answer: electrons

5. The horizontal rows in the periodic table are called _____.

Answer: periods

6. Explain why Mendeleev had to swap iodine and tellurium in his periodic table.

Answer: Mendeleev arranged elements by atomic mass, but iodine and tellurium did not fit the pattern based on their chemical properties. He swapped them so that iodine was placed with other halogens, despite its atomic mass being lower than tellurium. The later discovery of isotopes explained this anomaly, as tellurium has several heavy isotopes, giving it a higher average atomic mass.

7. Why do elements in the same group have similar chemical properties?

Answer: Elements in the same group have the same number of electrons in their

outer shell. Since chemical reactions depend on the number of outer-shell electrons, elements in the same group react in similar ways.

8. The table below shows the atomic number and atomic mass of four elements:

Element	Atomic Number	Atomic Mass
X	17	35.5
Y	18	40.0
Z	19	39.1

a. Use the periodic table to identify the elements X, Y, and Z.

Answer:

- X is chlorine (atomic number 17).
- Y is argon (atomic number 18).
- Z is potassium (atomic number 19).

b. Which element is a noble gas? Explain your choice.

Answer: Argon (Y) is a noble gas because it has a full outer electron shell, making it chemically unreactive. It is in group 0 in the periodic table.

9. Describe how the modern periodic table is organised and explain how this differs from Mendeleev's original periodic table.

Answer:

- In the modern periodic table, elements are arranged in order of increasing atomic number, which is the number of protons in the nucleus.
- Elements with similar chemical properties are placed in vertical columns called groups.
- The number of electron shells determines the row (period) an element is in.

Differences from Mendeleev's Table:

- Mendeleev arranged elements by atomic mass, whereas the modern table uses atomic number.
- Mendeleev left gaps for undiscovered elements, predicting their properties.
- Mendeleev had to swap elements (e.g., iodine and tellurium) based on chemical properties, but the modern table explains this using isotopes.

10. Identify the scientist responsible for each of the following:

A) Discovered noble gases and added a new group to the periodic table.

Answer: William Ramsay

B) Discovered isotopes, explaining atomic mass anomalies.

Answer: Frederick Soddy

C) Developed the first periodic table, arranging elements by atomic mass.

Answer: Dmitri Mendeleev

D) Rearranged the periodic table by atomic number using X-ray data.

Henry Moseley