Element Detectives

Use element data to explain the periodic table's layout

FB.2.2 "Obtain and use information about elements (e.g., chemical symbol, atomic number, atomic mass, and group or family) to describe the organization of the periodic table."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the rule that orders the periodic table, circle what group and period mean, and draw a line linking two table entries in the same group.

What an Element's Place Reveals

1. A glowing sign uses neon, while a party balloon may hold helium. To identify either element, a periodic table gives its chemical symbol, atomic number, and average atomic mass. An atomic number counts protons in one atom. Atomic mass, measured in atomic mass units (u), reflects the average mass of the element's naturally occurring atoms.

2. The table places elements in order of increasing atomic number. Each horizontal row is a period; each vertical column is a group, also called a family. Helium and neon are in group 18, the noble gases, because they have similar outer-electron patterns. Members of a family often share chemical behavior, even when they sit in different periods.

SELECTED PERIODIC TABLE ENTRIES

Element (symbol)	Atomic number	Atomic mass (u)	Group	Period
Lithium (Li)	3	6.94	1	2
Sodium (Na)	11	22.99	1	3
Magnesium (Mg)	12	24.31	2	3
Aluminum (Al)	13	26.98	13	3

3. Read an entry by connecting its symbol to its numbers and location. An atomic number tells you where an element belongs in the sequence, while a group identifies its column. Atomic mass often rises across a period, but it does not set the order. Use the data table to compare entries in both rows and families.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which two elements in the table share a group? Give their group, periods, and atomic numbers.

2. Which three listed elements occupy period 3? Put them in left-to-right order using their atomic numbers.

3. A sample is labeled Al. Use the table to identify the element, its group, and its atomic mass.

4. The four entries also increase in atomic mass. Why does that not mean atomic mass sets their order in the periodic table?

3 YOUR TURN

Your own words

Write four sentences for a museum display comparing Li and Mg. Include each element's symbol, atomic number, atomic mass, group, and period, and explain what their positions show about order and families.

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PART 1 · READ AND MARK

Underline the rule that orders the periodic table, circle what group and period mean, and draw a line linking two table entries in the same group. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which two elements in the table share a group? Give their group, periods, and atomic numbers.	**Lithium and sodium share group 1. Lithium is in period 2 with atomic number 3; sodium is in period 3 with atomic number 11.**
2	Which three listed elements occupy period 3? Put them in left-to-right order using their atomic numbers.	**Sodium (11), magnesium (12), aluminum (13).**
3	A sample is labeled Al. Use the table to identify the element, its group, and its atomic mass.	**Al is aluminum, in group 13, with an atomic mass of 26.98 u.**
4	The four entries also increase in atomic mass. Why does that not mean atomic mass sets their order in the periodic table?	**The periodic table is ordered by increasing atomic number, not atomic mass. These four entries happen to increase in both.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Lithium (Li) has atomic number 3, atomic mass 6.94 u, and belongs to group 1, period 2. Magnesium (Mg) has atomic number 12, atomic mass 24.31 u, and belongs to group 2, period 3. Their atomic numbers show that magnesium comes later in the table because elements are ordered by atomic number. Their different groups show that they do not belong to the same family.

Accept equivalent wording that uses the table's values accurately. For the display label, look for a comparison of both elements and an explanation based on atomic number and group.