1. Periodicity means that properties:

   ☐ only change down a group

   ☐ never change

   ☐ repeat in a regular pattern across each period

   ☐ are random

2. Which Period 3 elements react with water?

   ☐ silicon and phosphorus

   ☐ all of them

   ☐ none of them

   ☐ sodium (fast) and magnesium (very slowly)

3. Across Period 3, the oxides change from:

   ☐ all neutral, because the oxides are insoluble

   ☐ all basic, because every oxide contains oxygen

   ☐ acidic (metals) through amphoteric to basic (non-metals)

   ☐ basic (metals) through amphoteric to acidic (non-metals)

4. From its position, what can you predict about a Group 1 element?

   ☐ it is a reactive metal that forms a +1 ion

   ☐ it is a non-metal

   ☐ it forms a −1 ion

   ☐ it is an unreactive gas

5. Across Period 3, the atomic radius:

   ☐ decreases, as the rising nuclear charge pulls the same shell inwards

   ☐ increases, as a new shell is added each time

   ☐ increases, as shielding rises sharply

   ☐ stays constant, as all are in the same period

6. Sodium reacts vigorously with water to form sodium hydroxide and _____.

   _____

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☐ True ☐ False

8. The same periodic patterns apply to any group or period, not just Period 3.

   ☐ True ☐ False

9. Across Period 3, atomic radius increases.

   ☐ True ☐ False

10. What is the oxidation number of sulfur in SO_3?

    _____

1. **repeat in a regular pattern across each period**

   Periodicity is the repeating pattern of properties across the periods of the table.

2. **sodium (fast) and magnesium (very slowly)**

   Only Na and Mg react with water; sodium reacts fast, magnesium only very slowly with cold water.

3. **basic (metals) through amphoteric to acidic (non-metals)**

   Metal oxides on the left are basic; non-metal oxides on the right are acidic; Al_2O_3 is amphoteric in between.

4. **it is a reactive metal that forms a +1 ion**

   Group 1 elements are reactive metals with one outer electron, forming +1 ions.

5. **decreases, as the rising nuclear charge pulls the same shell inwards**

   More protons pull the outer shell in more strongly, while shielding stays about the same.

6. **hydrogen**

   $2Na + 2H_2O \rightarrow 2NaOH + H_2$.

7. **False**

   False. Sodium oxide is a basic metal oxide; it reacts with water to form sodium hydroxide, an alkaline solution. Non-metal oxides tend to be acidic.

8. **True**

   Periodicity is general – once you know the trends, they apply across the whole table.

9. **False**

   False. Atomic radius decreases across Period 3: nuclear charge rises while shielding stays similar, so electrons are pulled closer.

10. **6**

    $x + 3(-2) = 0$, so $x = +6$.

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