

## Chemistry Formula Writing Worksheet

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### Part 1: Building a Foundation

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#### What is the chemical symbol for Sodium?

Hint: Think about the periodic table.

- S
- Na
- Sn
- N

#### Which of the following are polyatomic ions?

Hint: Look for ions that consist of more than one atom.

- $\text{SO}_4^{2-}$
- $\text{NO}_3^-$
- $\text{Cl}^-$
- $\text{NH}_4^+$

#### Explain the difference between a cation and an anion.

Hint: Consider their charges.

#### List the chemical symbols for the following elements:

Hint: Refer to the periodic table for symbols.

1. Oxygen

2. Calcium

3. Iron

**Which of the following compounds is ionic?**

Hint: Consider the types of elements involved.

- CO<sub>2</sub>
- H<sub>2</sub>O
- NaCl
- CH<sub>4</sub>

## Part 2: Comprehension and Application

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**What does the subscript '2' indicate in the chemical formula H<sub>2</sub>O?**

Hint: Think about the number of atoms.

- Two molecules of water
- Two atoms of hydrogen
- Two atoms of oxygen
- Two ions of hydrogen

**Which of the following statements are true about covalent compounds?**

Hint: Consider the nature of bonding in these compounds.

- They involve the sharing of electrons.
- They are typically formed between metals and nonmetals.
- They can have prefixes like mono-, di-, and tri-.
- They are always neutral.

**Describe how the charges of ions are balanced in an ionic compound.**

*Hint: Think about the overall charge of the compound.*

**Which formula correctly represents calcium nitrate?**

*Hint: Consider the composition of the compound.*

- $\text{CaNO}_3$
- $\text{Ca}(\text{NO}_3)_2$
- $\text{Ca}_2\text{NO}_3$
- $\text{Ca}_3(\text{NO}_3)_2$

**Identify the correct formulas for compounds containing the sulfate ion.**

*Hint: Look for the sulfate ion in the formulas.*

- $\text{Na}_2\text{SO}_4$
- $\text{K}_2\text{SO}_4$
- $\text{MgSO}_4$
- $\text{Al}_2(\text{SO}_4)_3$

**Write the chemical formula for a compound formed between aluminum and oxygen. Explain your reasoning.**

*Hint: Consider the charges of the ions formed.*

### Part 3: Analysis, Evaluation, and Creation

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Which of the following compounds has a transition metal with a variable charge?

*Hint: Identify compounds with transition metals.*

- FeCl<sub>3</sub>
- NaCl
- MgO
- CO<sub>2</sub>

Analyze the following compounds and select those that are correctly balanced.

*Hint: Check the ratios of elements in the formulas.*

- K<sub>2</sub>O
- AlCl<sub>3</sub>
- CaCl<sub>2</sub>
- Na<sub>2</sub>O<sub>2</sub>

Analyze the compound Fe<sub>2</sub>O<sub>3</sub> and explain the oxidation state of iron in this compound.

*Hint: Consider the overall charge of the compound.*

Which of the following best explains why water (H<sub>2</sub>O) is a covalent compound?

*Hint: Think about the nature of the bond between hydrogen and oxygen.*

- It contains a metal and a nonmetal.
- It involves the transfer of electrons.
- It involves the sharing of electrons between hydrogen and oxygen.
- It forms a crystal lattice structure.

Evaluate the following statements and identify which are true about ionic compounds.

*Hint: Consider the properties of ionic compounds.*

- They conduct electricity when dissolved in water.
- They have high melting and boiling points.
- They are formed by the sharing of electrons.
- They are typically soluble in nonpolar solvents.

**Design a new compound using the elements potassium and sulfur. Write its chemical formula and explain the process of balancing the charges.**

*Hint: Consider the charges of potassium and sulfur ions.*