Chemistry at Home

Use compound names to uncover formulas and everyday uses.

CHE.5.2 "Generate formulas of ionic and covalent compounds from compound names. Discuss compounds in everyday life and compile lists and uses of these chemicals."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the four everyday compound names in the passage, then circle the ion charges or number prefixes that help you write each formula.

What Names Reveal

1. A product label can hide a chemistry puzzle. To build an ionic formula, identify each ion and choose the smallest whole-number ratio that makes the total charge zero. For example, lithium fluoride contains Li^+ and F^-, so its formula is LiF. A covalent name often uses prefixes to count atoms instead of balancing charges. In sulfur trioxide, no prefix on sulfur means one sulfur atom, while tri- means three oxygen atoms, giving SO_3. When an ionic compound contains a group of atoms, keep that group together as a unit. Parentheses show when more than one whole group is needed.

2. At a dinner table, sodium chloride seasons food. It is ionic: sodium forms Na^+, and chloride forms Cl^-. Those opposite charges must cancel in its formula. In some antacid tablets, calcium carbonate helps neutralize stomach acid. This compound contains Ca^{2+} and the carbonate ion, CO_3^{2-}. Carbonate is a unit of one carbon and three oxygen atoms; do not split it while balancing charges. Both compounds have familiar uses, but their formulas tell different stories: one uses two single-atom ions, and the other contains a group of atoms. Look for the whole ion before counting how many are needed.

3. A fizzy drink contains dissolved carbon dioxide, a covalent compound. The name dioxide says that each molecule has two oxygen atoms; the unprefixed carbon indicates one carbon atom. Silicon dioxide is another covalent compound. It makes up much of the sand used to make glass, including the glass in some drinking cups. In its name, dioxide again signals two oxygen atoms, and silicon has no prefix, so count one silicon atom. Unlike the ionic examples, these names give atom counts rather than ion charges. Whether a chemical is in a drink, a tablet, or a cup, its name can help you work out its formula.

2 ANSWER WITH EVIDENCE

Use the passage

1. Write the formula for sodium chloride. What is one use named in the passage?

2. Write the formula for calcium carbonate. What is one use named in the passage?

3. Write the formula for carbon dioxide. Where does the passage say you can find it?

4. Write the formula for silicon dioxide. How is it connected to an everyday object in the passage?

3 YOUR TURN

Your own words

Make a two-item list of everyday compounds not named in the passage: one ionic and one covalent. For each, give its name, formula, and use, then explain how you found the formula from ion charges or name prefixes.

Chemistry at Home

PART 1 · READ AND MARK

Underline the four everyday compound names in the passage, then circle the ion charges or number prefixes that help you write each formula. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Write the formula for sodium chloride. What is one use named in the passage?	**NaCl; it seasons food.**
2	Write the formula for calcium carbonate. What is one use named in the passage?	**$CaCO_3$; it helps neutralize stomach acid in some antacid tablets.**
3	Write the formula for carbon dioxide. Where does the passage say you can find it?	**CO_2; it is dissolved in a fizzy drink.**
4	Write the formula for silicon dioxide. How is it connected to an everyday object in the passage?	**SiO_2; it makes up much of the sand used to make glass, including some drinking cups.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Potassium iodide: KI; added to some iodized salt. K^+ and I^- balance in a 1:1 ratio.
Dinitrogen monoxide: N_2O; used in whipped cream dispensers. Di- means two nitrogen atoms, and mono- means one oxygen atom.

Accept other accurate ionic and covalent compounds not named in the passage if each formula, use, and explanation is correct. A correct covalent explanation may use an established molecular formula when a common name does not include prefixes.