

Atoms and Molecules

Writing Chemical Formulas

BACKGROUND*****

All matter is made of atoms. Elements such as silver, carbon, and helium are made up of only one kind of atom. When atoms combine in a chemical compound (or molecule) they combine in a definite ratio, or proportion. This ratio of atoms in a molecule can be written as a **chemical formula**. The chemical formula gives two important pieces of information about the compound:

1. Which elements are combined in the molecule. This is shown using the chemical symbol found on the periodic table for each element.
2. How many of each element is in the molecule. This is shown by writing a small number (subscript) just to the right of the chemical symbol.

EXAMPLES*****

Carbon dioxide (one of the gases we breathe out) is made of **two carbon atoms** and **one oxygen atom**. The chemical formula for this molecule is:



Water, on the other hand, has **two hydrogen atoms** and **one oxygen atom**. The chemical formula for water is written:



YOUR TURN*****

Finish filling in the table below to show the chemical formula and how many of each element is in these common molecules

NAME	FORMULA	NUMBER OF EACH ATOM?
Sodium Chloride	NaCl	① _____
Water	② _____	2 hydrogen , 1 oxygen
Sucrose (table sugar)	C ₁₁ H ₂₂ O ₁₁	③ _____
Ammonium nitrate (fertilizer)	NH ₄ NO ₃	④ _____
Hexane (in gasoline)	⑤ _____	6 carbon, 14 hydrogen
Sodium bicarbonate (baking soda)	NaHCO ₃	⑥ _____
Acetic Acid (in vinegar)	CH ₃ CO ₂ H	⑦ _____
Iron oxide (rust)	⑧ _____	2 iron, 3 oxygen