

**Objective:** Read a chemical formula.

**Chemical formulas tell you which and how many atoms there are.**

Reading chemical formulas is simple once you understand what everything means. Let's look at these examples. Each one looks the same but they mean different things. Label what the 2 represents in each one.

2H  
\_\_\_\_\_H<sub>2</sub>  
\_\_\_\_\_H<sup>2</sup>  
\_\_\_\_\_

**Coefficient:** tells you \_\_\_\_\_ of that atom, molecule or compound you have. It applies to all elements in a formula.

**Subscript:** tells you how many of that one \_\_\_\_\_ is in the formula

**Superscript:** tells you how many \_\_\_\_\_ have been added or removed.

**Counting atoms and elements follows the rules of math.**

When you determine how many atoms are in a formula, you must follow the basic rules of math. Look at these two examples, how many hydrogen atoms are there?

Formula	My Prediction	Correct Answer
H <sub>2</sub>	_____	_____
2H <sub>2</sub>	_____	_____

What happens if there is more than one element in the formula? Take a guess. In the following, predict how many hydrogen and oxygen atoms there are in the formula.

Formula	My Prediction	Correct Answer
H <sub>2</sub> O	H: _____ O: _____	H: _____ O: _____
2H <sub>2</sub> O	H: _____ O: _____	H: _____ O: _____

What happens if there are parentheses? It means those atoms are acting as one \_\_\_\_\_, called a \_\_\_\_\_ ion. If there is a subscript outside them it means there are more than one of those bonded atoms. Ex:  $(OH)_2$  means you have 2 OH in the formula. The OH is acting as one atom instead of two separate atoms.

Formula	My Prediction	Correct Answer
$Al(OH)_3$	Al: ____ O: ____ H: ____	Al: ____ O: ____ H: ____
$Al(NO_3)_3$	Al: ____ N: ____ O: ____	Al: ____ N: ____ O: ____

### Try it Out

For each of the following, state how many elements there are and how many of each element there are. The first one is done as an example for you.

Formula	Elements	How many?
NaCl	Sodium Chlorine	1 Na 1 Cl
2NaCl	Sodium Chlorine	2 Na 2 Cl
$H_2O_2$	_____	_____
$3H_2O_2$	_____	_____
$NH_3$	_____	_____
$Fe(OH)_2$	_____	_____
$Cu_3(PO_4)_2$	_____	_____

