

How to Count Atoms

KEY
(Notes)

Worksheet - As a class (front side)

1. The **symbol** of an element represents one atom of that element.

e.g., Ba = 1 barium atom

2. A **subscript** is a number written at the **lower right** corner **behind the symbol** of an element. If there is more than one atom of the element, then a subscript is used to indicate the number of atoms.

e.g., Cl₂ = 2 chlorine atoms

3. A **subscript outside a bracket** ^{multiplies} ~~multiplies~~ all the elements inside the brackets.

e.g., Ca₃(PO₄)₂

Ca = 3 Ca₃
P = 2 (PO₄)₂
O = 8 (PO₄)₂

3. A **coefficient** is a number written **in front of a chemical symbol** and indicates the number of atoms of that element or number of molecules

e.g., 3C = 3

2NaSO₄ = 4 Na 2 S 8 O

A **subscript** is a number written **after an atom in a formula** and indicates the number of atoms of the kind in the molecule.

e.g. H₂SO₄ The subscript of H = 2 and the subscript of O = 4

Note: a coefficient multiplies the number of atoms of each element in the formula

e.g.,

2 H₂O

2 molecules of H₂O → coefficient of 2

4 H (hydrogen) 2 × 2

2 O (oxygen) 2 × 1

3 Na₂SO₄

3 molecules of Na₂SO₄ → coefficient of 3

6 Na (sodium) 3 × 2

3 S (sulphur) 3 × 1

12 O (oxygen) 3 × 4

4 Pb(NO₃)₂

4 molecules of Pb(NO₃)₂ → coefficient of 4

4 Pb (Lead) 4 × 1

8 N (nitrogen) 4 × 1 × 2

24 O (oxygen) 4 × 3 × 2

Counting Atoms

KEY
(HW)

Worksheet - independent practice (back side)

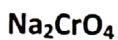
Count the atoms present in the different compounds by using the coefficients and subscripts.



Type of Atom	# of Atoms
K	2
C	1
O	3
Total	6



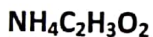
Type of Atom	# of Atoms
Ba	3
P	2
O	8
Total	13



Type of Atom	# of Atoms
Na	2
Cr	1
O	4
Total	7

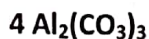


Type of Atom	# of Atoms
Ca	3
Cl	6
Total	9



Type of Atom	# of Atoms
N	1
H	7
C	2
O	2
Total	12

$4 + 3$



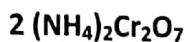
Type of Atom	# of Atoms
Al	8
C	12
O	36
Total	56

4×2
 $4 \times 1 \times 3$
 $4 \times 3 \times 3$



Type of Atoms	# of Atoms
Pb	1
N	2
O	6
Total	9

1×2
 3×2



Type of Atom	# of Atoms
N	4
H	16
Cr	4
O	14
Total	38

$2 \times 1 \times 2$
 $2 \times 4 \times 2$
 2×2
 2×7