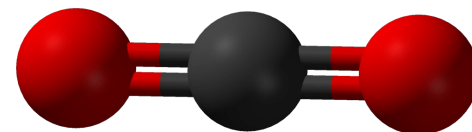
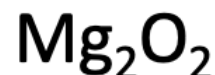
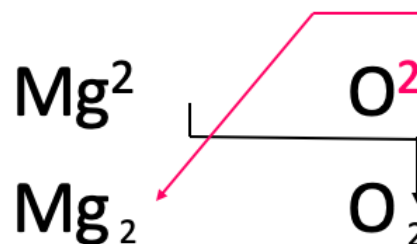
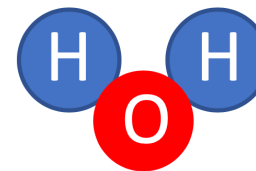
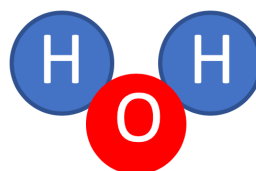


Chemical Symbols, Formulas & Compounds

- Symbols
- Element Names
- Counting Atoms
- Naming Compounds
- Combining Capacity
- Building a Molecule
- Criss-Cross Rule
- Naming Compounds



Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period	The Periodic Table of the Elements																	
1	1 H																	2 He
2	3 Li	4 Be										5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg										13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
Lanthanides			57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
Actinides			89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	



Preview File

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- Student versions have portions of the text removed which is given in the teacher version and appear as _____ which the students are to fill in
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Symbols

- From your work with the periodic table you know that each element is represented by a symbol made up of 1, 2 or 3 letters (I.e. Oxygen = O, Sodium = Na)

Legende

Ordnungszahl: 1 bis 118
 Symbol: Element-Symbol
 Serie: Alkalimetalle, Erdalkalimetalle, Übergangsmetalle, Lanthanoide, Actinoide, Metalle, Halbmetalle, Nichtmetalle, Halogene, Edelgase
 Atomgewicht: relative atomare Masse
 Elektronenkonfiguration: z.B. [Ne] 3s² 3p⁴
 Name: Elementname
 Schmelzpunkt: in °C
 Siedepunkt: in °C
 Dichte: in g/cm³
 Elektronegativität: nach Pauling
 Ordnungszahl: 1 bis 118
 Symbol: Element-Symbol
 Serie: Alkalimetalle, Erdalkalimetalle, Übergangsmetalle, Lanthanoide, Actinoide, Metalle, Halbmetalle, Nichtmetalle, Halogene, Edelgase
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 Dichte: in g/cm³
 Elektronegativität: nach Pauling

Gruppe

1 bis 18

Periode

1 bis 7

Lanthanoide

57 bis 71

Actinoide

89 bis 103

The Periodic Table of the Elements

Group → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

↓ Period

1 2 3 4 5 6 7

1 H 2 He
 3 Li 4 Be 5 B 6 C 7 N 8 O 9 F 10 Ne
 11 Na 12 Mg 13 Al 14 Si 15 P 16 S 17 Cl 18 Ar
 19 K 20 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr
 37 Rb 38 Sr 39 Y 40 Zr 41 Nb 42 Mo 43 Tc 44 Ru 45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe
 55 Cs 56 Ba 57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu
 72 Hf 73 Ta 74 W 75 Re 76 Os 77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn
 87 Fr 88 Ra 89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr
 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Cn 113 Nh 114 Fl 115 Mc 116 Lv 117 Ts 118 Og

Tableau périodique des éléments chimiques

Tableau périodique des éléments chimiques

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

1 H 2 He
 3 Li 4 Be 5 B 6 C 7 N 8 O 9 F 10 Ne
 11 Na 12 Mg 13 Al 14 Si 15 P 16 S 17 Cl 18 Ar
 19 K 20 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr
 37 Rb 38 Sr 39 Y 40 Zr 41 Nb 42 Mo 43 Tc 44 Ru 45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe
 55 Cs 56 Ba 57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu
 72 Hf 73 Ta 74 W 75 Re 76 Os 77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn
 87 Fr 88 Ra 89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr
 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Cn 113 Nh 114 Fl 115 Mc 116 Lv 117 Ts 118 Og

Notes

1. Pour l'atome de l'hydrogène (H), les électrons sont répartis en deux couches (K et L).

2. Les éléments de la colonne 1 (Li, Na, K, Rb, Cs, Fr) sont des métaux alcalins.

3. Les éléments de la colonne 2 (Be, Mg, Ca, Sr, Ba, Ra) sont des métaux alcalino-terreux.

4. Les éléments de la colonne 13 (B, Al, Ga, In, Tl, Nh) sont des métaux.

5. Les éléments de la colonne 14 (C, Si, Ge, Sn, Pb, Fl) sont des semi-conducteurs.

6. Les éléments de la colonne 15 (N, P, As, Sb, Bi, Mc) sont des non-métaux.

7. Les éléments de la colonne 16 (O, S, Se, Te, Po, Lv) sont des non-métaux.

8. Les éléments de la colonne 17 (F, Cl, Br, I, At, Ts) sont des halogènes.

9. Les éléments de la colonne 18 (He, Ne, Ar, Kr, Xe, Rn, Og) sont des gaz nobles.

10. Les éléments de la colonne 1 (Li, Na, K, Rb, Cs, Fr) sont des métaux alcalins.

11. Les éléments de la colonne 2 (Be, Mg, Ca, Sr, Ba, Ra) sont des métaux alcalino-terreux.

12. Les éléments de la colonne 13 (B, Al, Ga, In, Tl, Nh) sont des métaux.

13. Les éléments de la colonne 14 (C, Si, Ge, Sn, Pb, Fl) sont des semi-conducteurs.

14. Les éléments de la colonne 15 (N, P, As, Sb, Bi, Mc) sont des non-métaux.

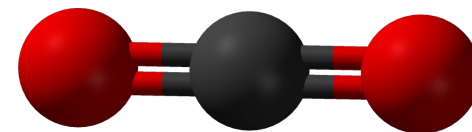
15. Les éléments de la colonne 16 (O, S, Se, Te, Po, Lv) sont des non-métaux.

16. Les éléments de la colonne 17 (F, Cl, Br, I, At, Ts) sont des halogènes.

17. Les éléments de la colonne 18 (He, Ne, Ar, Kr, Xe, Rn, Og) sont des gaz nobles.

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Counting Atoms in Compounds

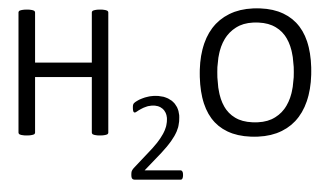


Carbon dioxide – CO₂

- There are over 118 known elements
- These elements can be combined in many different ways to make different compounds
 - I.e. Carbon dioxide - CO₂ is composed of C and O
- We use subscripts in a chemical formula to show how many atoms are in a compound
 - _____

Example - Water

In this compound, there are _____

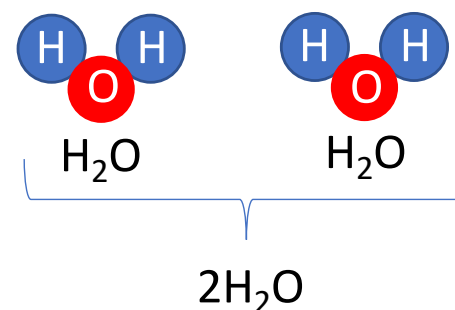


subscript



Counting Atoms

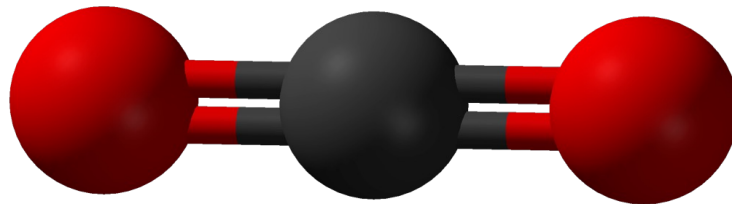
- Each symbol represents an element
- e.g. NaCl → Na = Sodium, Cl = Chlorine
- _____
- The number in front of the compound is called the coefficient
- The coefficient tells us how many of that compound there is
 - E.g. $2\text{H}_2\text{O} = \text{H}_2\text{O} + \text{H}_2\text{O}$



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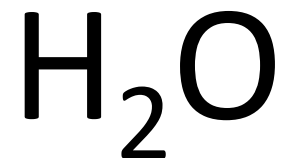
Combining Capacity

- Before we can write the chemical formula for a compound, we need to know how the atoms will combine with each other
- Atoms can make a specific number of connections (bonds) with other atoms
- _____
- When atoms combine, they form a bond

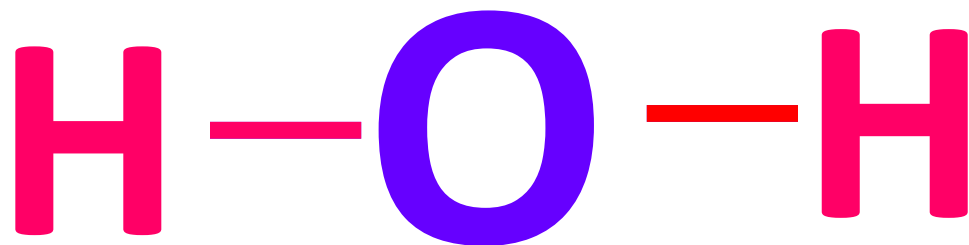


Combining Capacity

- The combining capacity of Hydrogen is 1
 - This means that a Hydrogen atom can make only one bond
- The combining capacity of Oxygen is 2
 - _____
- We simply switch the numbers and write them as subscripts on the other element (note that 1s are not included)



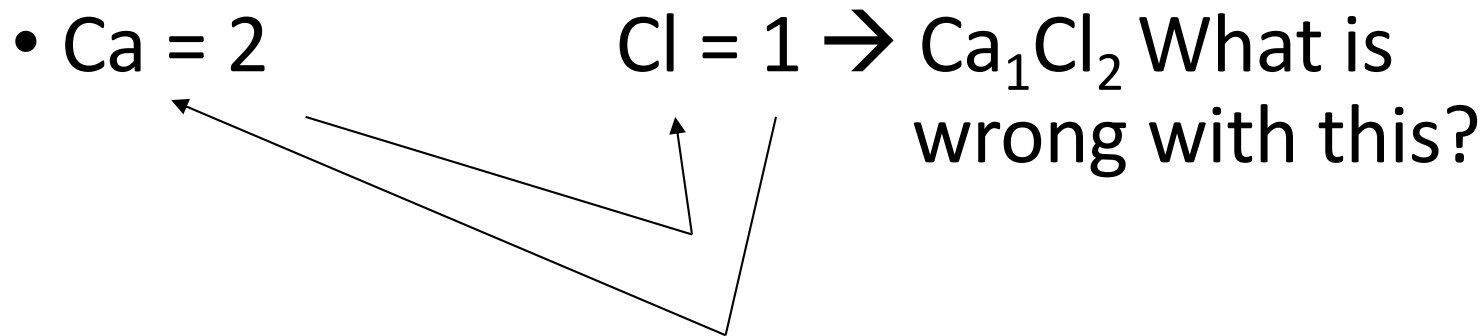
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- Each atom involved in making the molecule are “happy” because they are making the correct number of connections
- A diagram like the one above _____

Building a Molecule

- The combining capacity of Calcium is 2
 - This means that Calcium can make two bonds
- The combining capacity of Chlorine is 1
 - _____



$\text{Ca}_1\text{Cl}_2 \rightarrow$ What is wrong with this?

- _____

- _____

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Criss-Cross Rule

Aluminum chloride

Step 1:

write out name with space

Step 2:

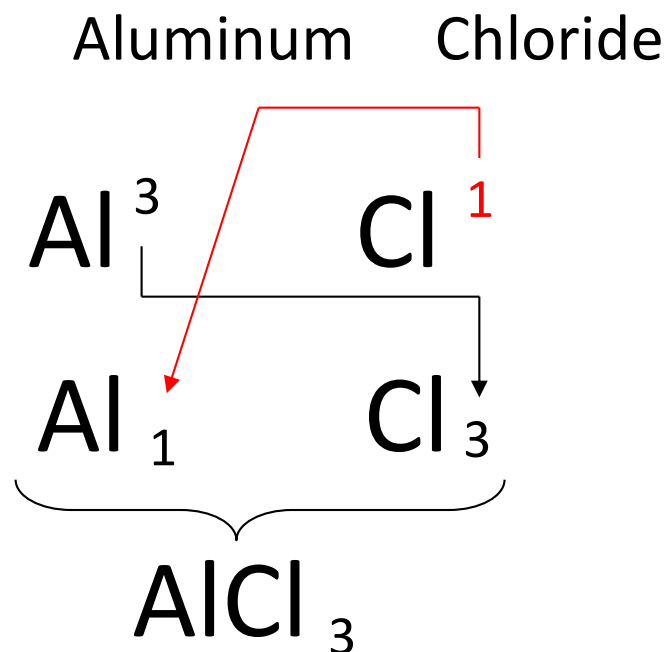
write symbols & combining capacity above

Step 3:

criss-cross combining capacity as subscripts

Step 4:

combine as formula unit
("1" is never shown)



Check Your Understanding

Aluminum (makes 3 bonds) oxide (makes 2 bonds)

Step 1:

write out name with space

Step 2:

write symbols & combining capacity above

Step 3:

criss-cross combining capacity as subscripts

Step 4:

combine as formula unit
("1" is never shown)

Naming Compounds

Rules

- Metals combine with nonmetals in many compounds
- Metals will be to the left of non-metals on the periodic table
 - If in doubt, the one to the left goes first
- Write the name of the metal first then the nonmetal
- _____

Check Your Understanding

Aluminum (metal) and Oxygen (nonmetal)

Chlorine (metal or nonmetal) and Magnesium
(metal or nonmetal)

Check Your Understanding

<u>Formula</u>	<u>Name</u>
----------------	-------------

1. BaO
2. NaBr
3. MgI₂
4. SrF₂
5. KCl
6. CsF