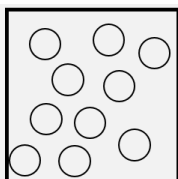




Elements

1. All substances are composed of atoms
2. Elements are made from only **one type of atom**.



e.g. this diagram shows an element because it is made from only one type of atom.

3. There are about 100 different elements
4. An atom is the smallest part of an element that can exist
5. Elements have specific physical and chemical properties
6. **Physical properties** = state, appearance, smell, magnetic, etc.
7. **Chemical properties** = what it reacts with and how reactive it is

Periodic Table

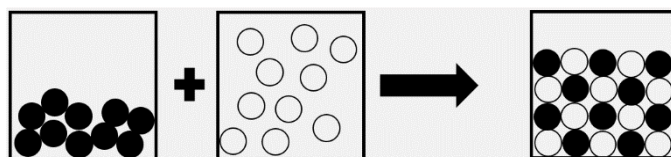
8. Elements are organised in the Periodic Table
9. The Periodic Table is organised into periods and groups
10. **Groups** are vertical columns
11. **Periods** are horizontal rows
12. Elements in a group have similar chemical properties
13. **Metals** are on the left hand side of the 'staircase' and **non-metals** are on the right hand side of the 'staircase'.

1 H 1.008	2 He 4.003																
3 Li 6.941	4 Be 9.012											5 B 10.811	6 C 12.011	7 N 14.007	8 O 15.999	9 F 18.998	10 Ne 20.180
11 Na 22.990	12 Mg 24.305											13 Al 26.982	14 Si 28.086	15 P 30.974	16 S 32.06	17 Cl 35.45	18 Ar 39.948
19 K 39.098	20 Ca 40.078	21 Sc 44.956	22 Ti 47.88	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.845	27 Co 58.933	28 Ni 58.69	29 Cu 63.546	30 Zn 65.38	31 Ga 69.723	32 Ge 72.63	33 As 74.922	34 Se 78.96	35 Br 79.904	36 Kr 83.798
37 Rb 85.468	38 Sr 87.62	39 Y 88.906	40 Zr 91.224	41 Nb 92.906	42 Mo 95.94	43 Tc 98	44 Ru 101.07	45 Rh 101.07	46 Pd 106.36	47 Ag 107.868	48 Cd 112.414	49 In 114.818	50 Sn 118.710	51 Sb 121.757	52 Te 127.6	53 I 126.905	54 Xe 131.29
55 Cs 132.905	56 Ba 137.327	57-70 * Lu 174.967	71 Hf 178.49	72 Ta 180.948	73 W 183.84	74 Re 186.207	75 Os 190.23	76 Ir 192.225	77 Pt 195.084	78 Au 196.967	79 Hg 200.59	80 Tl 204.387	81 Pb 207.2	82 Bi 208.98	83 Po 209	84 At 210	86 Rn 222
87 Fr [223]	88 Ra [226]	89-103 ** Lr [262]	104 Rf [261]	105 Db [262]	106 Sg [263]	107 Bh [264]	108 Hs [265]	109 Mt [266]	110 Ds [271]	111 Rg [272]	112 Cn [285]	113 Nh [284]	114 Fl [289]	115 Mc [288]	116 Lv [293]	117 Ts [294]	118 Og [294]

Compounds

14. Compounds are formed from elements by chemical reactions
15. Chemical reactions always involve the production of one or more new substances

e.g. in the diagram below there are two elements that when they react together, make a new compound



liquid element gas element solid compound

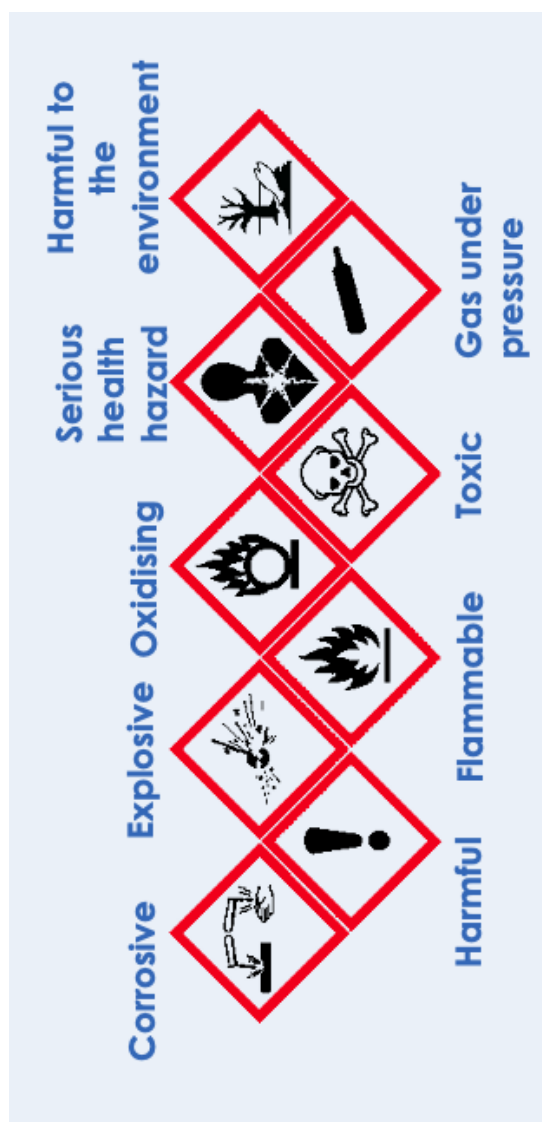
16. A compound contains two or more elements chemically joined together in fixed proportions
17. A compound has different properties from the elements it's composed
18. Compounds can only be separated into elements by chemical reactions
19. A **molecule** is two or more non-metal atoms chemically joined together – this can be an element (e.g. H₂) or a compound (e.g. H₂O)

Naming compounds

20. There are rules to follow when naming compounds:
 - a. Usually the metal goes first and the non-metal goes second
 - b. If a metal and a non-metal react, the name of the non-metal ends in **-ide**
 - c. For some compounds, if there are a different number of atoms we add in '**mono**' for 1, '**di**' for 2 and '**tri**' for 3
 - d. If the compound names ends in **-ate** then it usually contains three elements, including a non-metal and oxygen



Hazard symbols



Chemical formulae

21. Each element is represented by a chemical symbol.

e.g. Iron = Fe, oxygen = O, magnesium = Mg, gold = Au

22. The chemical formula of a molecule or compound tells you which elements and how many atoms of each are in one molecule

23. The small subscript number after an element symbol is the number of atoms of that element are in one molecule

e.g. In HNO_3 there is 1 atom of hydrogen, 1 atom of nitrogen and 3 atoms of oxygen per molecule.

