Symbols, atomic numbers & protons

Name: _____ Class: _____ Date: _____

About 30 minutes · 32 questions. Use the periodic table on the last page. The number at the top of each tile is the atomic number = protons in the nucleus of one atom.

1. Symbols and names

01. **O** _____

02. **H** _____

03. **C** _____

04. **N** _____

05. **Fe** _____

06. **Cu** _____

07. **Na** _____

08. **Cl** _____

2. Atomic numbers and protons

Q.	Symbol	Atomic number	Protons in one atom
9	**He**		
10	**Li**		
11	**O**		
12	**Mg**		
13	**Al**		
14	**S**		
15	**Ca**		
16	**Fe**		

Hint: atomic number and proton count are equal. Atomic number is not atomic mass.

Find your way around the table

Periods are horizontal rows. Groups are vertical columns. Write symbols carefully: a capital letter first, followed by a lowercase letter if there is a second letter.

17. Which element has atomic number 12? Write its symbol.

18. An atom has 17 protons. What is its element symbol?

19. Which element is directly to the right of O in the same period? Write its symbol.

20. Which element is directly below O in the same group? Write its symbol.

21. Which element is in period 3, group 1? Write its symbol.

22. How many more protons does one Al atom have than one Mg atom?

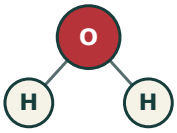
23. Which element has atomic number 79? Write its symbol.

24. What is the difference in proton count between one F atom and one O atom?

From atoms to molecules

Each labelled circle is one atom. These are simplified models, not to scale. Count the atoms; fill in the formula subscripts. Enter 1 in these boxes too, although 1 is normally omitted in a chemical formula.

25. Water



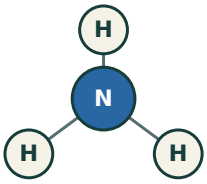
H ☐ O ☐

26. Carbon dioxide



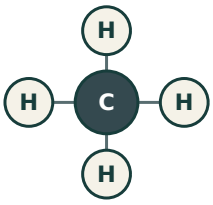
C ☐ O ☐

27. Ammonia



N ☐ H ☐

28. Methane



C ☐ H ☐

29. Two water molecules

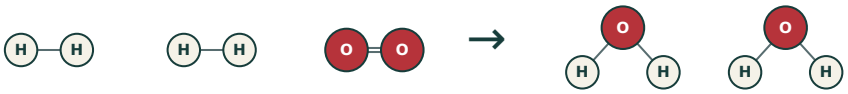


H	O	Total

Balance the equations

Enter the smallest possible positive whole numbers, including the coefficient 1. Do not change the subscripts in the formulas. Each type of atom must have equal counts on both sides of the arrow. Use the models to count molecules.

30.



☐ H_2 + ☐ O_2 → ☐ H_2O

Atom counts on the left: _____ on the right: _____

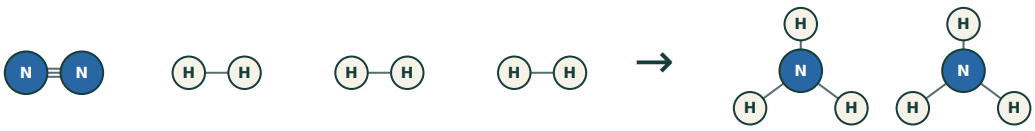
31.



☐ H_2 + ☐ Cl_2 → ☐ HCl

Atom counts on the left: _____ on the right: _____

32.



☐ N_2 + ☐ H_2 → ☐ NH_3

Atom counts on the left: _____ on the right: _____

The periodic table · 118 elements

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 **H** Hydrogen																	2 **He** Helium
2	3 **Li** Lithium	4 **Be** Beryllium											5 **B** Boron	6 **C** Carbon	7 **N** Nitrogen	8 **O** Oxygen	9 **F** Fluorine	10 **Ne** Neon
3	11 **Na** Sodium	12 **Mg** Magnesium											13 **Al** Aluminium	14 **Si** Silicon	15 **P** Phosphorus	16 **S** Sulfur	17 **Cl** Chlorine	18 **Ar** Argon
4	19 **K** Potassium	20 **Ca** Calcium	21 **Sc** Scandium	22 **Ti** Titanium	23 **V** Vanadium	24 **Cr** Chromium	25 **Mn** Manganese	26 **Fe** Iron	27 **Co** Cobalt	28 **Ni** Nickel	29 **Cu** Copper	30 **Zn** Zinc	31 **Ga** Gallium	32 **Ge** Germanium	33 **As** Arsenic	34 **Se** Selenium	35 **Br** Bromine	36 **Kr** Krypton
5	37 **Rb** Rubidium	38 **Sr** Strontium	39 **Y** Yttrium	40 **Zr** Zirconium	41 **Nb** Niobium	42 **Mo** Molybdenum	43 **Tc** Technetium	44 **Ru** Ruthenium	45 **Rh** Rhodium	46 **Pd** Palladium	47 **Ag** Silver	48 **Cd** Cadmium	49 **In** Indium	50 **Sn** Tin	51 **Sb** Antimony	52 **Te** Tellurium	53 **I** Iodine	54 **Xe** Xenon
6	55 **Cs** Caesium	56 **Ba** Barium	57–71 ↓	72 **Hf** Hafnium	73 **Ta** Tantalum	74 **W** Tungsten	75 **Re** Rhenium	76 **Os** Osmium	77 **Ir** Iridium	78 **Pt** Platinum	79 **Au** Gold	80 **Hg** Mercury	81 **Tl** Thallium	82 **Pb** Lead	83 **Bi** Bismuth	84 **Po** Polonium	85 **At** Astatine	86 **Rn** Radon
7	87 **Fr** Francium	88 **Ra** Radium	89–103 ↓	104 **Rf** Rutherfordium	105 **Db** Dubnium	106 **Sg** Seaborgium	107 **Bh** Bohrium	108 **Hs** Hassium	109 **Mt** Meitnerium	110 **Ds** Darmstadtium	111 **Rg** Roentgenium	112 **Cn** Copernicium	113 **Nh** Nihonium	114 **Fl** Flerovium	115 **Mc** Moscovium	116 **Lv** Livermorium	117 **Ts** Tennessine	118 **Og** Oganesson

57–71	57 **La** Lanthanum	58 **Ce** Cerium	59 **Pr** Praseodymium	60 **Nd** Neodymium	61 **Pm** Promethium	62 **Sm** Samarium	63 **Eu** Europium	64 **Gd** Gadolinium	65 **Tb** Terbium	66 **Dy** Dysprosium	67 **Ho** Holmium	68 **Er** Erbium	69 **Tm** Thulium	70 **Yb** Ytterbium	71 **Lu** Lutetium
89–103	89 **Ac** Actinium	90 **Th** Thorium	91 **Pa** Protactinium	92 **U** Uranium	93 **Np** Neptunium	94 **Pu** Plutonium	95 **Am** Americium	96 **Cm** Curium	97 **Bk** Berkelium	98 **Cf** Californium	99 **Es** Einsteinium	100 **Fm** Fermium	101 **Md** Mendelevium	102 **No** Nobelium	103 **Lr** Lawrencium

Top number = atomic number = protons in one atom. Columns: groups 1–18. Rows: periods 1–7. The two lower rows belong to periods 6 and 7.

Formula: H_2O = 2 H atoms and 1 O atom. Coefficient: 2 H_2O = 4 H atoms and 2 O atoms. Water is a compound, not an element.

Viðmið / References: IUPAC · iupac.org/what-we-do/periodic-table-of-elements/ | PubChem · pubchem.ncbi.nlm.nih.gov/periodic-table/ | Íslensk heiti: Þorsteinn Sæmundsson · halo.internet.is/frumefni.html