

# Periodic Table of the Elements

Period	1 IA	2 IIA											13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIII A	
1	1s 1 <b>H</b> hydrogen 1.008																	2 He helium 4	
2	2s 3 <b>Li</b> lithium 6.94	4 <b>Be</b> beryllium 9.01											5 <b>B</b> boron 10.81	6 <b>C</b> carbon 12.01	7 <b>N</b> nitrogen 14.01	8 <b>O</b> oxygen 16.00	9 <b>F</b> fluorine 19.00	10 <b>Ne</b> neon 20.18	
3	3s 11 <b>Na</b> sodium 22.99	12 <b>Mg</b> magnesium 24.31	3 III B	4 IV B	5 V B	6 VI B	7 VII B	8 VIII B	9 VIII B	10 VIII B	11 IB	12 IIB	13 Al aluminum 26.98	14 <b>Si</b> silicon 28.09	15 <b>P</b> phosphorus 30.97	16 <b>S</b> sulfur 32.06	17 <b>Cl</b> chlorine 35.46	18 <b>Ar</b> argon 39.95	
4	4s 19 <b>K</b> potassium 39.10	20 <b>Ca</b> calcium 40.08	21 <b>Sc</b> scandium 44.96	22 <b>Ti</b> titanium 47.87	23 <b>V</b> vanadium 50.94	24 <b>Cr</b> chromium 52.00	25 <b>Mn</b> manganese 54.94	26 <b>Fe</b> iron 55.85	27 <b>Co</b> cobalt 58.93	28 <b>Ni</b> nickel 58.69	29 <b>Cu</b> copper 63.55	30 <b>Zn</b> zinc 65.38	31 <b>Ga</b> gallium 69.72	32 <b>Ge</b> germanium 72.63	33 <b>As</b> arsenic 74.92	34 <b>Se</b> selenium 78.96	35 <b>Br</b> bromine 79.90	36 <b>Kr</b> krypton 83.80	
5	5s 37 <b>Rb</b> rubidium 85.47	38 <b>Sr</b> strontium 87.62	39 <b>Y</b> yttrium 88.91	40 <b>Zr</b> zirconium 91.22	41 <b>Nb</b> niobium 92.91	42 <b>Mo</b> molybdenum 95.96	43 <b>Tc</b> technetium [98]	44 <b>Ru</b> ruthenium 101.07	45 <b>Rh</b> rhodium 102.91	46 <b>Pd</b> palladium 106.42	47 <b>Ag</b> silver 107.87	48 <b>Cd</b> cadmium 112.41	49 <b>In</b> indium 114.82	50 <b>Sn</b> tin 118.71	51 <b>Sb</b> antimony 121.76	52 <b>Te</b> tellurium 127.6	53 <b>I</b> iodine 126.9	54 <b>Xe</b> xenon 131.29	
6	6s 55 <b>Cs</b> cesium 132.91	56 <b>Ba</b> barium 137.33	57 <b>Lu</b> lutetium 174.97	58 <b>Hf</b> hafnium 178.49	59 <b>Ta</b> tantalum 180.95	60 <b>W</b> tungsten 183.84	61 <b>Re</b> rhenium 186.21	62 <b>Os</b> osmium 190.23	63 <b>Ir</b> iridium 192.22	64 <b>Pt</b> platinum 195.08	65 <b>Au</b> gold 196.97	66 <b>Hg</b> mercury 200.59	67 <b>Tl</b> thallium 204.38	68 <b>Pb</b> lead 207.2	69 <b>Bi</b> bismuth 209.0	70 <b>Po</b> polonium [209]	71 <b>At</b> astatine [210]	72 <b>Rn</b> radon [222]	
7	7s 87 <b>Fr</b> francium [223]	88 <b>Ra</b> radium [226]	89 <b>Lr</b> lawrencium [262]	90 <b>Rf</b> rutherfordium [265]	91 <b>Db</b> dubnium [268]	92 <b>Sg</b> seaborgium [271]	93 <b>Bh</b> bohrium [270]	94 <b>Hs</b> hassium [277]	95 <b>Mt</b> meitnerium [276]	96 <b>Ds</b> darmstadtium [281]	97 <b>Rg</b> roentgenium [280]	98 <b>Cn</b> copernicium [285]	99 <b>Nh</b> nihonium [284]	100 <b>Fl</b> flerovium [289]	101 <b>Mc</b> moscovium [288]	102 <b>Lv</b> livermorium [293]	103 <b>Ts</b> tennessine [294]	104 <b>Og</b> oganesonium [294]	
	Alkali Metals	Alkaline Earth Metals											Non-Metals					Halogens	Nobel Gases
	lanthanides (rare earth metals)		57 <b>La</b> lanthanum 138.91	58 <b>Ce</b> cerium 140.12	59 <b>Pr</b> praseodymium 140.91	60 <b>Nd</b> neodymium 144.24	61 <b>Pm</b> promethium [145]	62 <b>Sm</b> samarium 150.36	63 <b>Eu</b> europium 151.96	64 <b>Gd</b> gadolinium 157.25	65 <b>Tb</b> terbium 158.93	66 <b>Dy</b> dysprosium 162.5	67 <b>Ho</b> holmium 164.93	68 <b>Er</b> erbium 167.26	69 <b>Tm</b> thulium 168.93	70 <b>Yb</b> ytterbium 173.05			
	actinides		89 <b>Ac</b> actinium [227]	90 <b>Th</b> thorium 232.04	91 <b>Pa</b> protactinium 231.04	92 <b>U</b> uranium 238.03	93 <b>Np</b> neptunium [237]	94 <b>Pu</b> plutonium [244]	95 <b>Am</b> americium [243]	96 <b>Cm</b> curium [247]	97 <b>Bk</b> berkelium [247]	98 <b>Cf</b> californium [251]	99 <b>Es</b> einsteinium [252]	100 <b>Fm</b> fermium [257]	101 <b>Md</b> mendelevium [258]	102 <b>No</b> nobelium [259]			

atomic # → 29 ← ions commonly formed  
 atomic symbol → **Cu**  
 English element name → copper  
 atomic mass (rounded) → 63.55

☐ Gases    ☐ Liquids    ☐ Metalloids

## Common Polyatomic Ions

ammonium	NH <sub>4</sub> <sup>+1</sup>	perchlorate	ClO <sub>4</sub> <sup>-1</sup>	hydrogen sulfate	HSO <sub>4</sub> <sup>-1</sup>	sulfate	SO <sub>4</sub> <sup>-2</sup>	oxalate	C <sub>2</sub> O <sub>4</sub> <sup>-2</sup>
hydronium	H <sub>3</sub> O <sup>+1</sup>	chlorate	ClO <sub>3</sub> <sup>-1</sup>			sulfite	SO <sub>3</sub> <sup>-2</sup>	silicate	SiO <sub>3</sub> <sup>-2</sup>
acetate	C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>-1</sup>	chlorite	ClO <sub>2</sub> <sup>-1</sup>	permanganate	MnO <sub>4</sub> <sup>-1</sup>	phthalate	C <sub>8</sub> H <sub>4</sub> O <sub>4</sub> <sup>-2</sup>	peroxide	O <sub>2</sub> <sup>-2</sup>
	CH <sub>3</sub> COO <sup>-1</sup>	hypochlorite	ClO <sup>-1</sup>	periodate	IO <sub>4</sub> <sup>-1</sup>	chromate	CrO <sub>4</sub> <sup>-2</sup>	tetraborate	B <sub>4</sub> O <sub>7</sub> <sup>-2</sup>
hydroxide	OH <sup>-1</sup>	nitrate	NO <sub>3</sub> <sup>-1</sup>	hydrogen carbonate	HCO <sub>3</sub> <sup>-1</sup>	dichromate	Cr <sub>2</sub> O <sub>7</sub> <sup>-2</sup>	borate	BO <sub>3</sub> <sup>-3</sup>
cyanide	CN <sup>-1</sup>	nitrite	NO <sub>2</sub> <sup>-1</sup>			carbonate	CO <sub>3</sub> <sup>-2</sup>	arsenate	AsO <sub>4</sub> <sup>-3</sup>
cyanate	OCN <sup>-1</sup>	bromate	BrO <sub>3</sub> <sup>-1</sup>	dihydrogen phosphate	H <sub>2</sub> PO <sub>4</sub> <sup>-1</sup>	hydrogen phosphate	HPO <sub>4</sub> <sup>-2</sup>	phosphate	PO <sub>4</sub> <sup>-3</sup>
thiocyanate	SCN <sup>-1</sup>	iodate	IO <sub>3</sub> <sup>-1</sup>					phosphite	PO <sub>3</sub> <sup>-3</sup>