

Periodic Table of The Elements

↓ Periods

		Groups ← →																										
		1A 1											3A 13	4A 14	5A 15	6A 16	7A 17	8A 18										
1	1 H (G) 1.01	2A 2	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> # of protons Element (physical state at STP) Atomic Weight </div>																									2 He (G) 4.00
2	3 Li (S) 6.94	4 Be (S) 9.01											5 B (S) 10.81	6 C (S) 12.01	7 N (G) 14.01	8 O (G) 16.00	9 F (G) 19.00	10 Ne (G) 20.18										
3	11 Na (S) 22.99	12 Mg (S) 24.31	3B 3	4B 4	5B 5	6B 6	7B 7	8 8	8B 9	10 10	1B 11	2B 12	13 Al (S) 26.98	14 Si (S) 28.09	15 P (S) 30.97	16 S (S) 32.07	17 Cl (G) 35.45	18 Ar (G) 39.95										
4	19 K (S) 39.10	20 Ca (S) 40.08	21 Sc (S) 44.96	22 Ti (S) 47.87	23 V (S) 50.94	24 Cr (S) 52.00	25 Mn (S) 54.94	26 Fe (S) 55.85	27 Co (S) 58.93	28 Ni (S) 58.69	29 Cu (S) 63.55	30 Zn (S) 65.39	31 Ga (S) 69.72	32 Ge (S) 72.64	33 As (S) 74.92	34 Se (S) 78.96	35 Br (L) 79.90	36 Kr (G) 83.80										
5	37 Rb (S) 85.47	38 Sr (S) 87.62	39 Y (S) 88.91	40 Zr (S) 91.22	41 Nb (S) 92.91	42 Mo (S) 95.94	43 Tc (L) [98]	44 Ru (S) 101.07	45 Rh (S) 102.91	46 Pd (S) 106.42	47 Ag (S) 107.87	48 Cd (S) 112.41	49 In (S) 114.82	50 Sn (S) 118.71	51 Sb (S) 121.76	52 Te (S) 127.60	53 I (S) 126.90	54 Xe (G) 131.29										
6	55 Cs (S) 132.91	56 Ba (S) 137.33	* 71 Lu (S) 174.97	72 Hf (S) 178.49	73 Ta (S) 180.95	74 W (S) 183.84	75 Re (S) 186.21	76 Os (S) 190.23	77 Ir (S) 192.22	78 Pt (S) 195.08	79 Au (S) 196.97	80 Hg (L) 200.59	81 Tl (S) 204.38	82 Pb (S) 207.2	83 Bi (S) 208.98	84 Po (S) [208.98]	85 At (S) [209.99]	86 Rn (G) [222.02]										
7	87 Fr (S) [223.02]	88 Ra (S) [226.03]	~ 103 Lr (X) [262.11]	104 Rf (X) [262.11]	105 Db (X) [262.11]	106 Sg (X) [266.12]	107 Bh (X) [264.12]	108 Hs (X) [269.13]	109 Mt (X) [268.14]	110 [271.15]	111 [272.15]	112 [277]		114 [285]		116 [289]												

Lanthanide Series *	57 La (S) 138.91	58 Ce (S) 140.12	59 Pr (S) 140.91	60 Nd (S) 144.24	61 Pm (X) [145]	62 Sm (S) 150.36	63 Eu (S) 151.97	64 Gd (S) 157.25	65 Tb (S) 158.93	66 Dy (S) 162.50	67 Ho (S) 164.93	68 Er (S) 167.26	69 Tm (S) 168.93	70 Yb (S) 173.04
Actinide Series ~	89 Ac (S) [227.03]	90 Th (S) 232.04	91 Pa (S) 231.04	92 U (S) 238.03	93 Np (X) [237.05]	94 Pu (X) [244.06]	95 Am (X) [243.06]	96 Cm (X) [247.07]	97 Bk (X) [247.07]	98 Cf (X) [251.08]	99 Es (X) [252.08]	100 Fm (X) [257.10]	101 Md (X) [258.10]	102 No (X) [259.10]

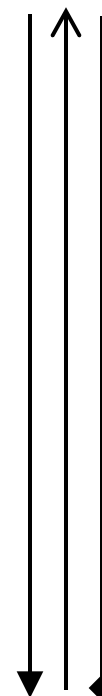
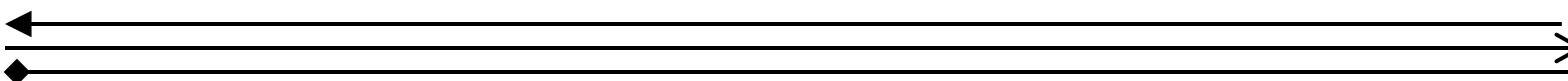
Periodic Table Key

- ♦ Atomic weights enclosed by brackets are weights of the most important or longest-lived isotope of radioactive elements.
- ♦ Elements with no symbol (110-112, 114, 116) have not yet been named.
- ♦ Group labels 1, 2, 3, etc. are recommended by the International Union of Pure and Applied Chemistry; the labels 1A, 2A, 3B, etc. are more common American usage.
- ♦ The physical states of the elements at STP (standard temperature, 0° C, and standard pressure, 1 atm) are either S (solid), L (liquid), or G (gas). X designates synthetically prepared elements.
- ♦ Elements in group 1A (except H) are alkali metals, in 2A are alkaline earth metals, in 3B—2B are transition metals, in 8A are noble (rare) gases, and in 7A (except At) are halogens. Elements with bold borders are metalloids, underlined elements are other metals, and wave underlined elements are other nonmetals. Lanthanide and actinide series are rare earth metals,

Actinium	Ac	Cobalt	Co	Iridium	Ir	Oxygen	O	Silver	Ag
Aluminum	Al	Copper	Cu	Iron	Fe	Palladium	Pd	Sodium	Na
Americium	Am	Curium	Cm	Krypton	Kr	Phosphorus	P	Strontium	Sr
Antimony	Sb	Dubnium	Db	Lanthanum	La	Platinum	Pt	Sulfur	S
Argon	Ar	Dysprosium	Dy	Lawrencium	Lr	Plutonium	Pu	Tantalum	Ta
Arsenic	As	Einsteinium	Es	Lead	Pb	Polonium	Po	Technetium	Tc
Astatine	At	Erbium	Er	Lithium	Li	Potassium	K	Tellurium	Te
Barium	Ba	Europium	Eu	Lutetium	Lu	Praseodymium	Pr	Terbium	Tb
Berkelium	Bk	Fermium	Fm	Magnesium	Mg	Promethium	Pm	Thallium	Tl
Beryllium	Be	Fluorine	F	Manganese	Mn	Protactinium	Pa	Thorium	Th
Bismuth	Bi	Francium	Fr	Meitnerium	Mt	Radium	Ra	Thulium	Tm
Bohrium	Bh	Gadolinium	Gd	Mendelevium	Md	Radon	Rn	Tin	Sn
Boron	B	Gallium	Ga	Mercury	Hg	Rhenium	Re	Titanium	Ti
Bromine	Br	Germanium	Ge	Molybdenum	Mo	Rhodium	Rh	Tungsten	W
Cadmium	Cd	Gold	Au	Neodymium	Nd	Rubidium	Rb	Uranium	U
Calcium	Ca	Hafnium	Hf	Neon	Ne	Ruthenium	Ru	Vanadium	V
Californium	Cf	Hassium	Hs	Neptunium	Np	Rutherfordium	Rf	Xenon	Xe
Carbon	C	Helium	He	Nickel	Ni	Samarium	Sm	Ytterbium	Yb
Cerium	Ce	Holmium	Ho	Niobium	Nb	Scandium	Sc	Yttrium	Y
Cesium	Cs	Hydrogen	H	Nitrogen	N	Seaborgium	Sg	Zinc	Zn
Chlorine	Cl	Indium	In	Nobelium	No	Selenium	Se	Zirconium	Zr
Chromium	Cr	Iodine	I	Osmium	Os	Silicon	Si		

Table & Trends of Electronegativity, Electron Affinity, 1st Ionization Energy, Atomic Radii, & Metallic Character of Select Elements

Electronegativity		Electron Affinity (kJ/mol)		Element																									
1 st Ionization Energy (kJ/mol)		Atomic Radius (Å)																											
2.1	-73																			> 0									
H	1312																			He									
0.37																				2372									
																				0.32									
1.0	-60	1.5	> 0															2.0	-27	2.5	-122	3.0	> 0	3.5	-141	4.0	-328	> 0	
Li	520	Be	899															B	801	C	1086	N	1402	O	1314	F	1681	Ne	2081
1.34		0.90																0.82	0.77	0.75	0.73	0.71	0.69						
0.9	-53	1.2	> 0															1.5	-43	1.8	-134	2.1	-72	2.5	-200	3.0	-349	> 0	
Na	496	Mg	738															Al	578	Si	786	P	1012	S	1000	Cl	1251	Ar	1521
1.54		1.30																1.18	1.11	1.06	1.02	0.99	0.97						
0.8	-48	1.0	-2	1.3	1.5	1.6	1.6	1.5	1.8	1.9	1.9	1.6	1.6	-30	1.8	-119	2.0	-78	2.4	-195	2.8	-325	> 0						
K	419	Ca	590	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr										
1.96		1.74		1.44	1.36	1.25	1.27	1.39	1.25	1.26	1.21	1.38	1.31	1.26	1.22	1.19	1.16	1.14	1.10										
0.8	-47	1.0	-5	1.2	1.4	1.6	1.8	1.9	2.2	2.2	2.2	1.9	1.7	1.7	-30	1.8	-107	1.9	-103	2.1	-190	2.5	-295	> 0					
Rb	403	Sr	549	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe										
2.11		1.92		1.62	1.48	1.37	1.45	1.56	1.26	1.35	1.31	1.53	1.48	1.44	1.41	1.38	1.35	1.33	1.30										
0.7	0.9	1.0	1.3	1.5	1.7	1.9	2.2	2.2	2.2	2.4	1.9	1.8	1.9	1.9	2.0	2.2	> 0												
Cs	376	Ba	503	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn										
														589	716	703	812		1037										



- ◆ → arrows indicate increasing atomic radii as you move down and to the left of the periodic table.
- ◆ → arrows indicate increasing 1st ionization energy as you move up and the right of the periodic table.
- ◆ → arrows indicate increasing metallic character as you move down and to the left of the periodic table.

* Information for this handout was obtained from the following sources:

- Brown, LeMay, & Bursten. *Chemistry: The Central Science*. 9th Ed. Pearson Education, Inc. 2003.
- <http://www.chemicalelements.com/>
- <http://environmentalchemistry.com/yogi/periodic/#periodic%20table%20of%20elements>

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