

The Families of the Periodic Table

Periodic Table of the Elements

1 H																	2 He								
3 Li	4 Be																	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									
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									

* Lanthanide Series
+ Actinide Series

Adapted from:

Some images are from www.chem4kids.com

www.middleschoolscience.com 2008

Families on the Periodic Table

- Elements on the periodic table can be grouped into families based on their **chemical** properties.
 - Each family has a **specific name** to differentiate it from the other families in the periodic table.
 - Elements in each family **react** differently with other elements.
- Periodic Table of the Elements

1 H	2 He											11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar																								
3 Li	4 Be											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 B	6 C	7 N	8 O	9 F	10 Ne											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										
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

Periodic Table of the Elements

1A																	2				
1	H																	He			
	IIA																				
3	Li															Be					
2	4																				
11	12															13	14	15	16	17	18
Na	Mg	III B	IV B	V B	VI B	VII B	VIII		IX	X	IB	2B	B	C	N	O	F	Ne			
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86				
Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
87	88	89	104	105	106	107	108	109	110												
Fr	Ra	*Ac	Rf	Ha	106	107	108	109	110												
7																					

* Lanthanide Series

+ Actinide Series

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

ALKALI METALS

Group 1

- Hydrogen is ***not*** a member, it is a **non-metal**
- 1 electron in the outer shell
- Soft and silvery metals
- ***Very*** reactive, esp. with water
- Conduct electricity

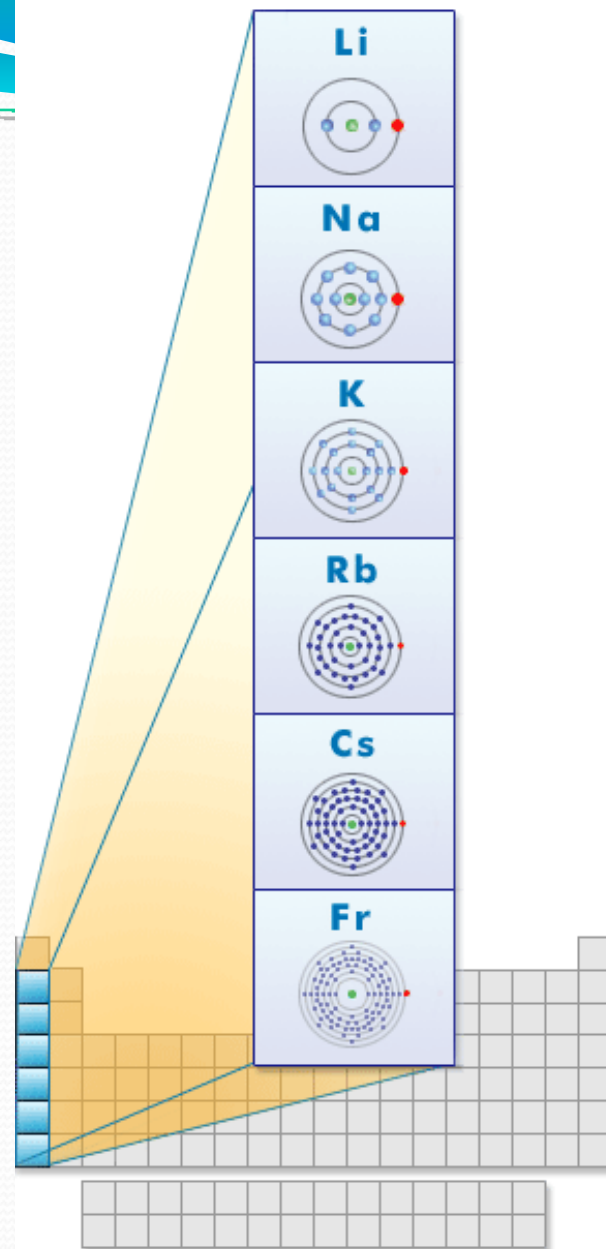
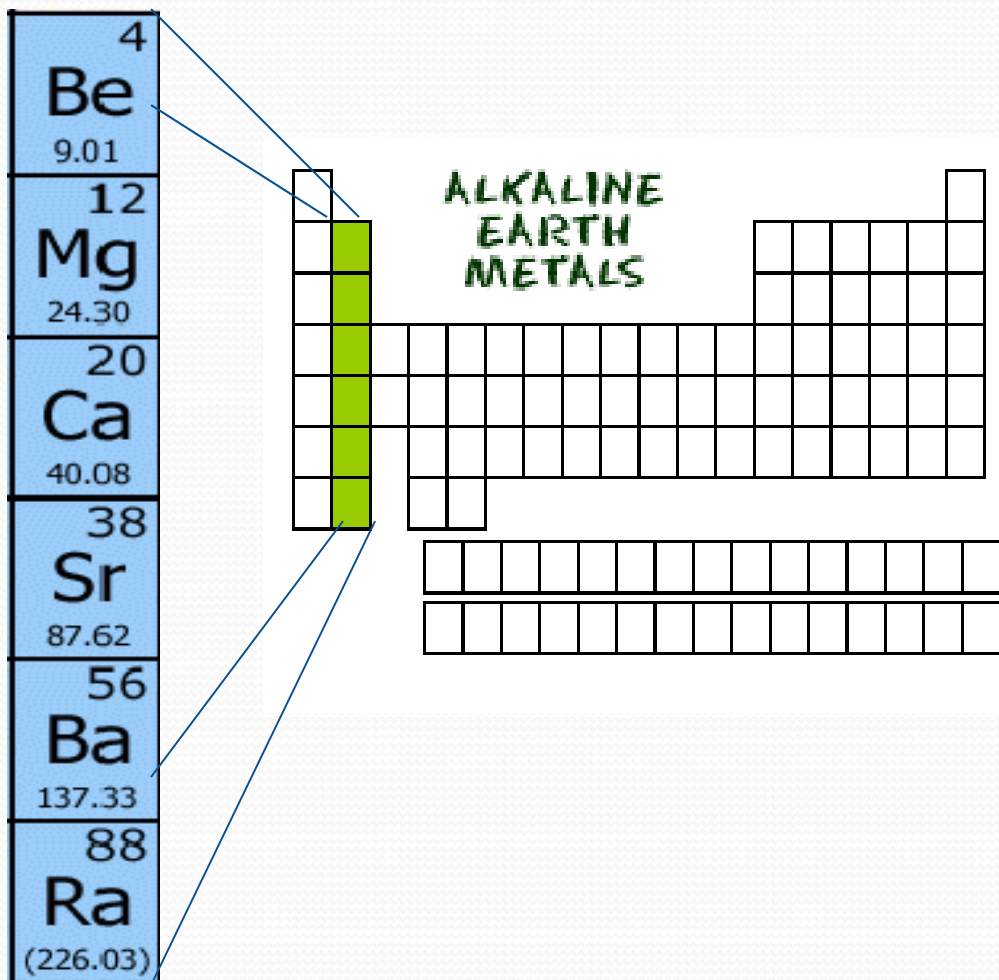


Image: <http://www.learner.org/interactives/periodic/groups2.html>

ALKALINE EARTH METALS



A periodic table diagram with the elements of Group 2 highlighted in green. To the left of the main table, a vertical strip lists the elements of Group 2 with their atomic numbers, symbols, and atomic weights. Blue lines connect these elements to their corresponding positions in the main periodic table grid. The main grid shows the layout of the periodic table, with the green column representing Group 2. The text 'ALKALINE EARTH METALS' is written in green above the grid.

Atomic Number	Symbol	Atomic Weight
4	Be	9.01
12	Mg	24.30
20	Ca	40.08
38	Sr	87.62
56	Ba	137.33
88	Ra	(226.03)

ALKALINE EARTH METALS

Group 2

- 2 electrons in the outer shell
- White and malleable
- Reactive, but less than Alkali metals
- Conduct electricity

TRANSITION METALS

Groups in the middle

Periodic Table of the Elements

		21	22	23	24	25	26	27	28	29	30								
		Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn								
		44.96	47.88	50.94	52.00	54.94	55.85	58.93	58.69	63.55	65.39								
		39	40	41	42	43	44	45	46	47	48								
		Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd								
		88.91	91.22	92.91	95.94	(97.91)	101.07	102.91	106.42	107.87	112.41								
		57	72	73	74	75	76	77	78	79	80								
		La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg								
		138.91	178.49	180.95	183.85	186.21	190.23	192.22	195.08	196.97	200.59								
		89	104	105	106														
		Ac	Rf	Ha	Sg														
		(227.03)	(261.11)	(262.11)	(263.12)														

- Good conductors of heat and electricity.
- Some are used for jewelry.
- The transition metals are able to put up to 32 electrons in their second to last shell.
- Can bond with many elements in a variety of shapes.

BORON FAMILY

Periodic Table
of the Elements

Group 3

- 3 electrons in the outer shell
- Most are metals
- Boron is a **metalloid**

CARBON FAMILY

Periodic Table
of the Elements

The image shows a simplified periodic table of elements. The elements are represented by gray squares. The noble gases column, which is the last column on the right, is highlighted in yellow. This column includes elements like Helium, Neon, Argon, Krypton, Xenon, and Radon. The table is arranged in rows and columns, with the noble gases column being the rightmost one.

Group 4

- 4 electrons in the outer shell
- Contains metals, metalloids, and a **non-metal Carbon (C)**

NITROGEN FAMILY

Periodic Table of the Elements

Group 5

- 5 electrons in the outer shell
- Can share electrons to form compounds
- Contains metals, metalloids, and **non-metals**

OXYGEN FAMILY

Periodic Table
of the Elements

Group 6

- 6 electrons in the outer shell
- Contains metals, metalloids, and **non-metals**
- Reactive

Halogens

THE HALOGEN GROUP

[illegible][illegible]

Group 7

- 7 electrons in the outer shell
- All are **non-metals**
- **Very reactive** are often bonded with elements from Group 1

Noble Gases

THE INERT GASES (NOBLE GASES)

2	He	4.00
10	Ne	20.18
18	Ar	39.95
36	Kr	83.80
54	Xe	131.29
86	Rn	(222.02)

Group 8

- Exist as gases
- Non-metals
- 8 electrons in the outer shell = Full
- Helium (He) has only 2 electrons in the outer shell = Full
- Not reactive with other elements

Rare Earth Metals

Periodic Table of the Elements

58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (144.91)	62 Sm 150.36	63 Eu 151.97	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97
90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np (237.05)	94 Pu (244.06)	95 Am (243.06)	96 Cm (247.07)	97 Bk (247.07)	98 Cf (251.08)	99 Es (252.08)	100 Fm (257.10)	101 Md (258.10)	102 No (259.10)	103 Lr (262.11)

- Some are Radioactive
- The rare earths are silver, silvery-white, or gray metals.
- Conduct electricity