

Why is the periodic table set up in this very specific way? To figure this out, do the following:

- Fill the electron shells (numerically) for elements 1 through 20 of the periodic table. Carbon is done as an example.



H								He
Li	Be		B	C	N	O	F	Ne
Na	Mg		Al	Si	P	S	Cl	Ar
K	Ca							

- How many electrons are in the **outside shell** of H, Li, Na, K ? _____
 - What **column** of the periodic table are H, Li, Na, and K found in? _____
 - How many electrons are in the **outside shell** of Be, Mg, Ca? _____
 - What **column** of the periodic table are Be, Mg, and Ca found in? _____
 - How many electrons are in the **outside shell** of B and Al? _____
 - What **column** of the periodic table are B and Al found in? _____
 - How many electrons are in the **outside shell** of C and Si? _____
 - What **column** of the periodic table are C and Si found in? _____
 - How many electrons are in the **outside shell** of N and P? _____
 - What **column** of the periodic table are N and P found in? _____
 - How many electrons are in the **outside shell** of O and S? _____
 - What **column** of the periodic table are O and S found in? _____
 - How many electrons are in the **outside shell** of F and Cl? _____
 - What **column** of the periodic table are F and Cl found in? _____
 - Is Helium's outside shell full? _____
 - How many electrons are in the **outside shell** of Ne and Ar? _____
 - What **column** of the periodic table are He, Ne, and Ar found in? _____
 - What is the relationship between the column and electrons of an atom? _____
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- How many electron shells do H and He require? _____
 - How many electron shells do Li, Be, B, C, N, O, F, and Ne require? _____
 - How many electron shells do Na, Mg, Al, Si, P, S, Cl, and Ar require? _____
 - How many electron shells do K and Ca require? _____
 - What **row of the periodic table** are H and He in? _____
 - What **row** of the periodic table are Li, Be, B, C, N, O, F, and Ne in? _____
 - What is the relationship between electron shells and rows? _____

27. Study periodic table #1 on the next page. Find where the electron shells are filled to the left of each symbol. Look at the column and # of electrons in the outside shell. Next, look at the row of the periodic table and # of electron shells needed for each element. Discuss the pattern of the columns and rows of the periodic table with your group.
28. Why is Hydrogen #1 on the periodic table?
29. Why is Sodium (Na) # 11 on the periodic table?
30. What determines the arrangement of elements from 1 to 92 on the periodic table?
31. Summarize the arrangement of the periodic table. Your answer should include, atomic number, protons, columns, rows, electrons in outside shell, # of shells.

NEXT,

1. Put correct #^os/roman numerals on the top of columns of the CPO side of periodic table handout.
2. Put a circle around the elements that you are familiar with or you have heard of on the periodic table.
3. Put a square around your 2 favorite elements (any reason...you like the name, you like the substance, etc.)
4. Put a triangle around the elements that surprised you that they were elements. For example, I am always surprised that tin is an element.
5. Discuss your answers to 2-5 of this section with your group.
6. **Color the columns** of your periodic table like they are colored on your table tiles.

The modern periodic table of the elements (see Figure 1-4) is arranged in a slightly different way, but it still uses the same basic concepts that Mendeleev used.

Key:

- Electron configuration
- Covalent atomic radius (Å)
- Relative size of atom
- Atomic number
- Symbol
- Atomic mass (weight)

The number in parentheses denotes the mass number (not the atomic-weight) of the isotope with the longest half-life.

PERIOD	TRANSITION ELEMENTS										MAIN GROUP ELEMENTS									
	1A	2A	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
1	1 H 1.0079																		2 He 4.00260	
2	2 Li 6.941	2 Be 9.01218												3 B 10.81	4 C 12.011	5 N 14.0067	6 O 15.9994	7 F 18.998403	8 Ne 20.179	
3	3 Na 22.98977	4 Mg 24.303												5 Al 26.98154	6 Si 28.0855	7 P 30.97376	8 S 32.06	9 Cl 35.453	10 Ar 39.948	
4	4 K 39.0983	5 Ca 40.08	6 Sc 44.9559	7 Ti 47.90	8 V 50.9414	9 Cr 51.996	10 Mn 54.9380	11 Fe 55.847	12 Co 58.9332	13 Ni 58.71	14 Cu 63.546	15 Zn 65.38	16 Ga 69.723	17 Ge 72.59	18 As 74.9216	19 Se 78.96	20 Br 79.904	21 Kr 83.80		
5	5 Rb 85.468	6 Sr 87.62	7 Y 88.9059	8 Zr 91.22	9 Nb 92.9064	10 Mo 95.94	11 Tc 98.9062	12 Ru 101.07	13 Rh 102.9055	14 Pd 106.4	15 Ag 107.868	16 Cd 112.41	17 In 114.82	18 Sn 118.69	19 Sb 121.75	20 Te 127.60	21 I 126.9045	22 Xe 131.30		
6	6 Cs 132.9054	7 Ba 137.33	8 La [†] 138.9055	9 Hf 178.49	10 Ta 180.9479	11 W 183.85	12 Re 186.207	13 Os 190.2	14 Ir 192.22	15 Pt 195.09	16 Au 196.9665	17 Hg 200.59	18 Tl 204.37	19 Pb 207.2	20 Bi 208.9804	21 Po (209)	22 At (210)	23 Rn (222)		
7	7 Fr (223)	8 Ra 226.0254	9 Ac [†] (227)	10 Rf	11 Db	12 Sg (263)	13 Bh (262)	14 Hs	15 Mt											
			† LANTHANIDE SERIES																	
			58 Ce 140.12	59 Pr 140.9077	60 Nd 144.24	61 Pm (145)	62 Sm 150.4	63 Eu 151.96	64 Gd 157.25	65 Tb 158.9254	66 Dy 162.50	67 Ho 164.9304	68 Er 167.26	69 Tm 168.9342	70 Yb 173.04	71 Lu 174.967				
			† ACTINIDE SERIES																	
			90 Th 232.0381	91 Pa 231.0369	92 U 238.029	93 Np 237.0482	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (254)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (260)				

Figure 1-4. The modern periodic table of the elements.

