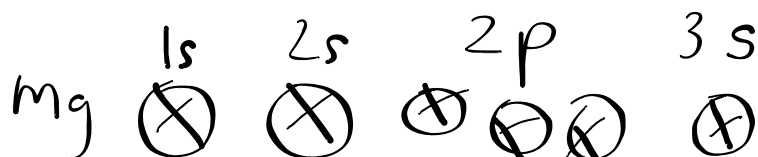
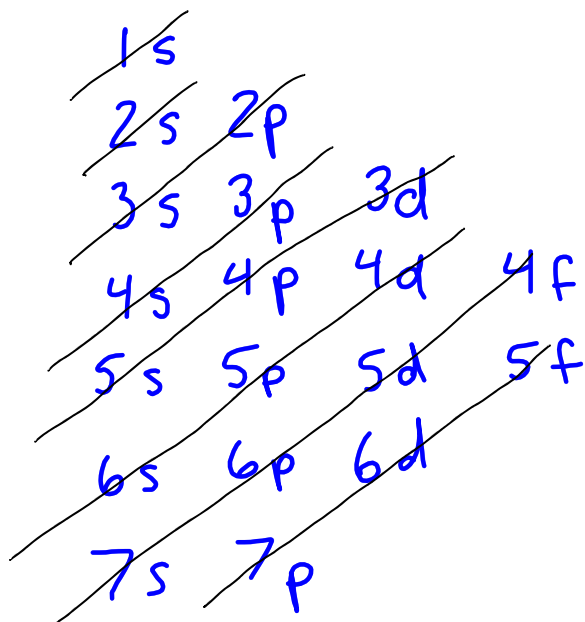


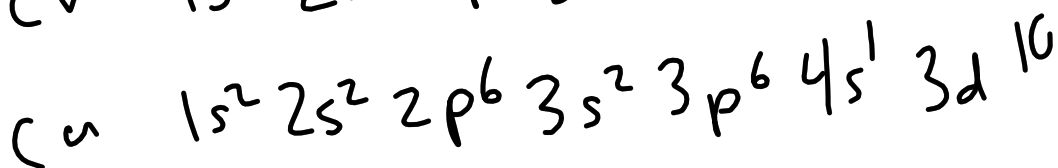
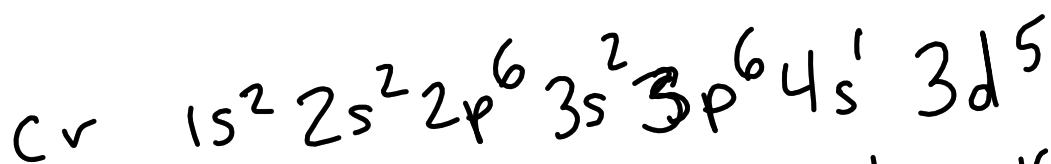
### Bell Ringer #13

1. Sketch the diagonal rule.
2. What is the aufbau principle?
3. Write orbital notation for fluorine.
4. Write orbital notation for magnesium.
5. By knowing about the placement of electrons, we can understand more about why certain elements react and why they have certain physical and chemical properties.



# Irregularities in the 3d's (Cr, Cu)

		<u>4s</u>	<u>3d</u>
Sc	✓	⊗	⊙ ⊙ ⊙ ⊙ ⊙
Ti	✓	⊗	⊙ ⊙ ⊙ ⊙ ⊙
V	✓	⊗	⊙ ⊙ ⊙ ⊙ ⊙
Cr	✓	⊙	⊙ ⊙ ⊙ ⊙ ⊙
Mn	✓	⊗	⊙ ⊙ ⊙ ⊙ ⊙
Fe	✓	⊗	⊗ ⊙ ⊙ ⊙ ⊙
Co	✓	⊗	⊗ ⊗ ⊙ ⊙ ⊙
Ni	✓	⊗	⊗ ⊗ ⊗ ⊙ ⊙
Cu	✓	⊙	⊗ ⊗ ⊗ ⊗ ⊗
Zn	✓	⊗	⊗ ⊗ ⊗ ⊗ ⊗



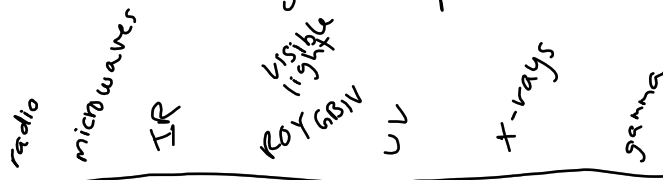
1 2 3 4 5 6 7	IA	d										p						VIIA	VIIIA
	1 H 1.00794											III A	IV A	VA	VIA	1 H 1.00794	2 He 4.002602		
	3 Li 6.941	4 Be 9.012182											5 B 10.811	6 C 12.0107	7 N 14.00674	8 O 15.9994	9 F 18.9984032	10 Ne 20.1797	
	11 Na 22.989770	12 Mg 24.3050	IIIB	IVB	VB	VIB	VII B	VIII B			IB	II B	13 Al 26.981538	14 Si 28.0855	15 P 30.973761	16 S 32.066	17 Cl 35.4527	18 Ar 39.948	
	19 K 39.0983	20 Ca 40.078	21 Sc 44.955910	22 Ti 47.867	23 V 50.9415	24 Cr 51.9961	25 Mn 54.938049	26 Fe 55.845	27 Co 58.933200	28 Ni 58.6934	29 Cu 63.546	30 Zn 65.39	31 Ga 69.723	32 Ge 72.61	33 As 74.92160	34 Se 78.96	35 Br 79.904	36 Kr 83.80	
	37 Rb 85.4678	38 Sr 87.62	39 Y 88.90585	40 Zr 91.224	41 Nb 92.90638	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.90550	46 Pd 106.42	47 Ag 107.8682	48 Cd 112.411	49 In 114.818	50 Sn 118.710	51 Sb 121.760	52 Te 127.60	53 I 126.90447	54 Xe 131.29	
	55 Cs 132.90545	56 Ba 137.327	57 La* 138.9055	72 Hf 178.49	73 Ta 180.9479	74 W 183.84	75 Re 186.207	76 Os 190.23	77 Ir 192.227	78 Pt 195.078	79 Au 196.96655	80 Hg 200.59	81 Tl 204.3833	82 Pb 207.2	83 Bi 208.98038	84 Po (209)	85 At (210)	86 Rn (222)	
87 Fr (223)	88 Ra (226)	89 Ac** (227)	104 Rf (261)	105 Db (262)	106 Sg (263)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 Ds (269)	111 Uuu (272)	112 Uub (277)		114 Uug (289)		116 Uuh (289)		118 Uuo (293)		
* Lanthanide series		58 Ce 140.116	59 Pr 140.90765	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25	65 Tb 158.92534	66 Dy 162.50	67 Ho 164.93032	68 Er 167.26	69 Tm 168.93421	70 Yb 173.04	71 Lu 174.967				
** Actinide series		90 Th 232.0381	91 Pa 231.03588	92 U 238.0289	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)				

f

electron configuration

P       $1s^2 2s^2 2p^6 3s^2 3p^3$   
 Ca       $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$   
 Br

# Electromagnetic Spectrum



increasing energy →

Same - (3) travel at the speed of light ( $3.00 \times 10^8 \text{ m/s} = c$ )

(1) photons of energy

(2) travel in waves



$\lambda$  = wavelength - distance between two identical parts of the wave

$\psi$  amplitude - vertical distance from crest or trough to baseline

frequency - # of wavelengths that pass a point in a second

$$c = \lambda \nu$$

$\lambda \uparrow \quad \nu \downarrow$   
 $\lambda \downarrow \quad \nu \uparrow$

different

- (1) different wavelengths/frequencies
- (2) different amounts of energy