

Atomic Radius **decreases**  
 Across a Period Ionization Energy **increases**  
 Electronegativity **increases** → Why? nuclear pull increases

Down a Group  
 Atomic Radius **increases**  
 Ionization Energy **decreases**  
 Electronegativity **decreases**

Alkali Metals: Same period means same... # energy levels (e- shells)

Purpose of this? separates metals from nonmetals

Reactivity of metals? **increase**

Reactivity of nonmetals? **increase**

Why? # of e- shells increases

Same group means same... # valence e- and chemical properties

Metals:

- low I.E.
- low electronegativity
- lose e-
- Form + ions
- good conductors
- luster (shiny)
- malleable (bendy)
- ductile (stretchy)
- smaller ionic radius

Nonmetals:

- high I.E.
- high electronegativity
- gain e-
- Form - ions
- poor conductors
- dull (not shiny)
- brittle (not bendy)
- larger ionic radius

Phases at STP:  
 Gases: H, He, N, O, F, Cl, Ne, Ar, Kr, Xe, Rn  
 Liquids: Hg and Br  
 Solids: Everything else

1	2											18	19	20				
H	He											Ar	Kr	Xe				
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
Li	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S	Cl	Ar			
11	12	Transition Metals										29	30	35	36			
Na	Mg	Sc	Ti	V	Cr	Mn	Fe	Cobalt	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
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	Cobalt	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	57-70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs	Ba	* * * * *	Lr	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub	Uuc	Uud	Uue	Uuf	Rn	
87	88	89-102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Fr	Ra	* * * * *	Lr	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub	Uuc	Uud	Uue	Uuf	Uug	Uuh