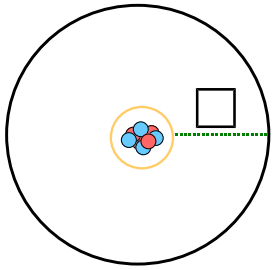
CONCEPT: PERIODIC TREND: ATOMIC RADIUS

- **Atomic radius**: Distance between an atom's nucleus and its outer electron shell (valence shell).

Atomic Radius



□ ____ = atomic radius

□ protons = ___ charged particle

□ neutrons = neutral particle

□ nucleus = contains the ____ & ____

□ Going down a **group** ____ number of electrons and ____ number of electron shells.

□ Moving across a **period** ____ number of electrons within the same electron shell.

- _____ electrons in same shell = _____ attraction with nucleus = slight decrease in atomic radius

□ **Periodic Trend:** Atomic Radius _____ moving from left to right across a period and going up a group.

Atomic Radius ___

	1A (1)	2A (2)	3B (3)	4B (4)	5B (5)	6B (6)	7B (7)	8B (8)	8B (9)	8B (10)	1B (11)	2B (12)	3A (3)	4A (4)	5A (5)	6A (6)	7A (7)	8A (8)
1	H 37 pm																	He 31 pm
2	Li 152 pm	Be 112 pm											B 85 pm	C 77 pm	N 75 pm	O 73 pm	F 72 pm	Ne 70 pm
3	Na 186 pm	Mg 160 pm											Al 143 pm	Si 117 pm	P 110 pm	S 104 pm	Cl 99 pm	Ar 98 pm
4	K 227 pm	Ca 197 pm	Sc 162 pm	Ti 147 pm	V 134 pm	Cr 128 pm	Mn 127 pm	Fe 126 pm	Co 125 pm	Ni 124 pm	Cu 128 pm	Zn 134 pm	Ga 135 pm	Ge 123 pm	As 120 pm	Se 117 pm	Br 114 pm	Kr 112 pm
5	Rb 248 pm	Sr 215 pm	Y 180 pm	Zr 160 pm	Nb 146 pm	Mo 139 pm	Tc 136 pm	Ru 134 pm	Rh 134 pm	Pd 137 pm	Ag 144 pm	Cd 151 pm	In 166 pm	Sn 140 pm	Sb 141 pm	Te 143 pm	I 133 pm	Xe 131 pm
6	Cs 265 pm	Ba 222 pm	La 187 pm	Hf 159 pm	Ta 146 pm	W 139 pm	Re 137 pm	Os 135 pm	Ir 136 pm	Pt 138 pm	Au 144 pm	Hg 151 pm	Tl 171 pm	Pb 175 pm	Bi 155 pm	Po 164 pm	At 142 pm	Rn 140 pm
7	Fr 348 pm	Ra 283 pm																

EXAMPLE: Which one of the following atoms has the largest atomic radius?

a) K b) Rb c) Y d) Ca e) Sr

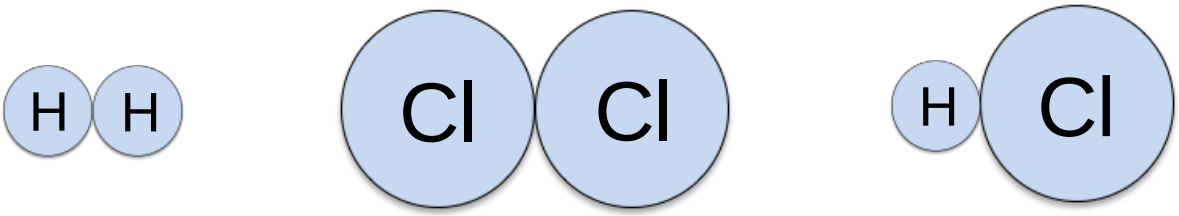
PRACTICE: Arrange the following atoms in order of decreasing atomic radius: Sr, Se, Ne, Zn

CONCEPT: PERIODIC TREND: ATOMIC RADIUS

PRACTICE: Which alkaline earth metal has the smallest atomic radius?

a) Ca b) Rb c) Na d) Ra e) Fr

PRACTICE: If the sum of the atomic radii of diatomic hydrogen is 74 pm and of diatomic chlorine is 198 pm, what is the sum of the atomic radii between a hydrogen atom and a chlorine atom.



PRACTICE: In moving from top to bottom in the same column on the periodic table, what trend is expected for atomic size?

a) Increase because the nucleus is getting stronger.

b) Increase because electrons are being placed in higher n-values.

c) Decrease because the nucleus is getting stronger.

d) Increase because electrons are being added to degenerate orbitals.

e) Decrease because electrons are being placed in higher n-values.