South Pasadena • AP Chemistry

Name _____
Period ___ Date ___/___/___

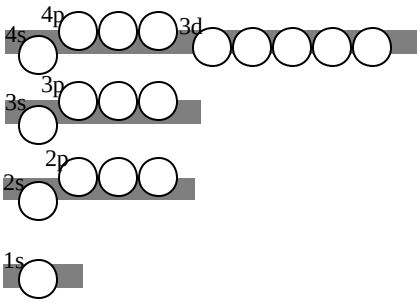
8 • Electron Configurations & Periodicity

VALENCE ELECTRONS

The electrons that spend their time farthest from the nucleus (those with the largest value of "n") are very important. These are the electrons that actually "bump into" each other when atoms interact. These are called the valence electrons.

Because of the way the energy levels overlap (for instance, 4s and 3d), the outermost electrons are not always the highest energy electrons.

Valence electrons: The outermost electrons. These are ALWAYS electrons in the "s" and "p" orbitals.

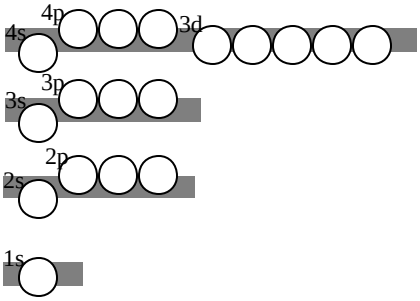


How many electrons in an arsenic, As, atom? ____

Draw the orbital diagram for As.

Draw a box around those electrons that would be called "valence electrons".

How many valence electrons in As? ____

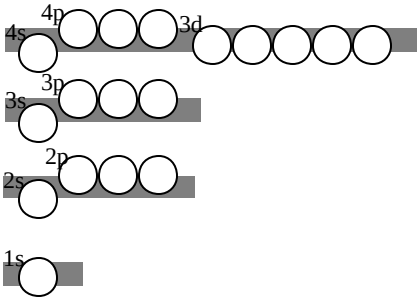


How many electrons in a copper, Cu, atom? ____

Draw the orbital diagram for Cu.

Draw a box around those electrons that would be called "valence electrons".

How many valence electrons in Cu? ____

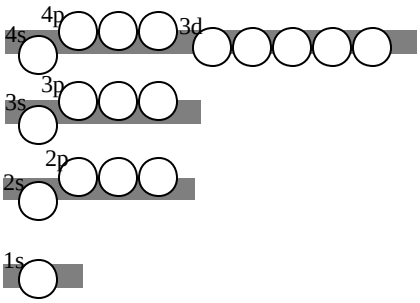


How many electrons in a calcium, Ca, atom? ____

Draw the orbital diagram for Ca.

Draw a box around those electrons that would be called "valence electrons".

How many valence electrons in Ca? ____



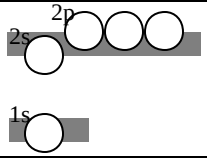
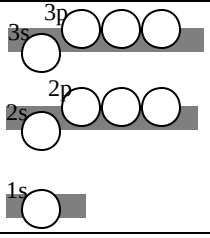
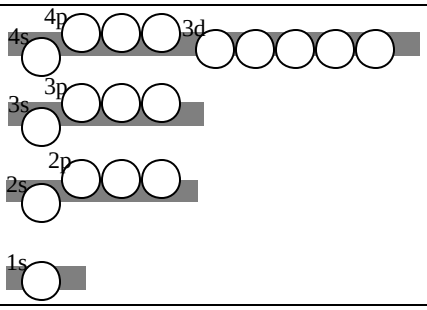
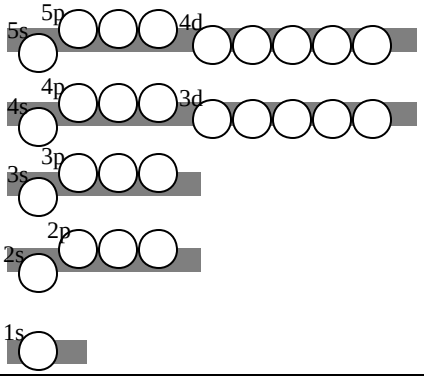
How many electrons in a krypton, Kr, atom? ____

Draw the orbital diagram for Kr.

Draw a box around those electrons that would be called "valence electrons".

How many valence electrons in Kr? ____

Consider the O/S family:
Draw the orbital diagram and both forms of the electron configuration of four members of Family VI:
Write the **short form** and then the **long form** for each of these elements.
Draw a box around the valence electrons.

O		Oxygen, O O O
S		Sulfur, S S S
Se		Selenium, Se Se Se
Te		Tellurium, Te Te Te

Family Similarities and Valence Electrons:
Write the symbols for the valence electrons (outermost s & p) found in the following elements. Note the similarities in the vertical columns.

Per	IA	IIA	IIIA	IVA	VA	VIA	VIIA	VIIIA
1	H • $1s^1$							He • $1s^2$
2	Li • $2s^1$	Be	B	C	N	O	F	Ne
3	Na • $3s^1$	Mg	Al	Si	P	S	Cl	Ar
4	K • $4s^1$	Ca	Ga	Ge	As	Se	Br	Kr
5	Rb • $5s^1$	Sr	In	Sn	Sb	Te	I	Xe
6	Cs • $6s^1$	Ba	Tl	Pb	Bi	Po	At	Rn
7	Fr • $7s^1$	Ra						