Guided Notes- Bonding #1

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| Electrons  Electron configuration  Chemical properties  Valence Electrons  How many valence electrons are there?  Octet Rule  Why do they have partial or full shells?  Lewis Dot Diagrams  Ionization energy  Cation  Anion | Electrons are the only \_\_\_\_\_\_\_\_ subatomic particles directly involved in chemical reactions.    Electron configuration = Distribution of electrons in an atom's electron \_\_\_\_\_\_\_\_\_ (orbitals).  http://iws.collin.edu/biopage/faculty/mcculloch/1406/outlines/chapter%202/Periodic%20Table.jpg  If an atom does not have enough \_\_\_\_\_\_\_\_\_\_ to fill all shells, the outer shell will be the only one partially filled.  Chemical properties of an atom depend upon the number of **\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_**.  *Example- Group 1 all the elements are highly reactive to H20.*  Valence electrons = Electrons in the atom’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy shell.  You can tell how many valence electrons there are in each atom by looking at its \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_.  Valence Electrons final.png     |  |  | | --- | --- | | Group # | # of valence electrons | | 1 | 1 | | 2 | 2 | | 13\* | 3 | | 14\* | 4 | | 15\* | 5 | | 16\* | 6 | | 17\* | 7 | | 18\* | 2 (for period 1 ONLY)  8 (noble gases already have a full energy shell!) |   *\*As you can see you “ignore” the 1 in Groups 13-18)*  Practice- How many valence electrons does K have? (Hint- what group # is K in?) \_\_\_\_\_\_\_  Practice- How many valence electrons does C have? \_\_\_\_\_\_\_  An atom with a complete valence shell is \_\_\_\_\_\_\_\_\_\_\_ or inert.  An atom with an \_\_\_\_\_\_\_\_\_\_\_ valence shell is chemically reactive (tends to form chemical bonds until it has 8 electrons to fill the valence shell).  **Octet rule** = Rule that a valence shell is \_\_\_\_\_\_\_\_\_\_ when it contains 8 electrons (except H and He in Period 1).  [https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9GcQv52tp-lqjsj7Pu2d6VGiRFcTe3GfYT0wfE1d62l0A6qv50aZx0Q](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=mUl5f8QtIC8FNM&tbnid=1XrjnvNs8nc2_M:&ved=0CAUQjRw&url=http://chemistry.about.com/od/elementfacts/ig/Atom-Diagrams/Lithium-Atom.-dsj.htm&ei=F0ylUrmREeTgyQGctYGgAg&psig=AFQjCNGscjqpUUKswMDCYLG-njk0qX4U0g&ust=1386651018140775) \_partial\_ valence shell [https://encrypted-tbn1.gstatic.com/images?q=tbn:ANd9GcTdlzLU0U84iZluqEmrGoWgkxsBM4xnPQtxCpajHPAV3WYIHEE1](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=jJfwB13I3c79lM&tbnid=tT1NM66iV_8AUM:&ved=0CAUQjRw&url=http://en.wikipedia.org/wiki/Noble_gas&ei=TUylUoLxMIS0yAHqgoGQCA&psig=AFQjCNET87lH5An9I8KQAuKk28Qm1-L-yQ&ust=1386651061216079)\_empty\_ valence shell  Li has \_\_\_\_ valence electrons and Ne has \_\_\_\_\_ valence electrons.  \*Remember you need 8 electrons for an atom to be \_\_\_\_\_\_\_\_\_\_\_.  A Lewis structure is a structural representation of a molecule where dots are used to show \_\_\_\_\_\_\_\_\_ position around the \_\_\_\_\_\_\_.  [File:Lewis dot Li.svg](http://upload.wikimedia.org/wikipedia/commons/2/26/Lewis_dot_Li.svg) [http://t1.gstatic.com/images?q=tbn:ANd9GcS4wNnxGkbxghE8bz4pb4SckGUY0L_HQ81wdDEPdKOMojz_hsUxgg](http://www.google.com/url?sa=i&source=images&cd=&cad=rja&docid=tnSXmyCbSNRIoM&tbnid=GlPN4-Se47jRlM:&ved=0CAgQjRw&url=http://www.m2c3.com/chemistry/VLI/M1_Topic3/M1_Topic3_print.html&ei=6FGlUo_rE42FyQHi9oAI&psig=AFQjCNHfJCzDUFJJaK5BQsuZ2hCpQVfbpA&ust=1386652520381011)  Ionization energy is a measure of the difficulty of \_\_\_\_\_\_\_\_\_\_\_ electron or the strength by which an electron is bound.  The higher the ionization energy, the more \_\_\_\_\_\_\_\_ it is to remove an electron.  *\*Remember as you go from \_left\_\_ to \_right\_ across the periodic table it becomes more and more difficult to remove an electron.*  A cation is an ion with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_charge and is formed when an atom \_\_\_\_\_\_\_\_\_\_\_ one or more electrons.  Groups 1, 2, and 13 tend to be \_\_\_\_\_\_\_\_\_.  An anion is an ion with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_charge and is formed when an atom \_\_\_\_\_\_\_\_\_\_\_ one or more electrons.  Groups 15, 16 and 17 tend to be \_\_\_\_\_\_\_\_\_.  *Practice:* Is Ca a cation or an anion? (Hint- what is Ca’s group #?)\_\_\_\_\_\_\_\_\_\_  Is F a cation or an anion? \_\_\_\_\_\_\_\_\_\_ |