Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_

**Introduction:** *It is important to know what the subatomic particles are, where they are located in an atom, and that atoms of different elements differ because they contain different numbers of protons. First, fill in the blanks. Then sketch each atom, indicating the number of protons and neutrons in the nucleus.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Element* | *Symbol* | *Atomic Number* | *Mass Number* | *Number of Protons* | *Number of Neutrons* | *Number of Electrons* |
| Carbon-12 | C | 6 | 12 | 6 | 6 | 6 |
|  |
| Nitrogen-14 |  | 7 | 14 |  |  |  |
|  |
| Chlorine-35 |  |  | 35 | 17 |  |  |
|  |
| Oxygen-16 |  |  |  |  |  | 8 |
|  |
| Oxygen-17 |  |  |  |  |  |  |
|  |

**Introduction:** *The atoms of four elements important to life are diagrammed below. Pay particular attention to their electron shells. Remember that atoms with incomplete outer electron shells participate in chemical reactions that allow them to attain complete outer shells: 2 electrons for a hydrogen atom, 8 for most other elements important to life.*

1. Given the information and diagrams above, show how electrons would be transferred between calcium and chlorine atoms to form calcium and chloride ions, which would attract each other to form calcium chloride, CaCl2. (Hint: An atom can gain or lose more than one electron.)

2. Using the information and diagrams above, show how nitrogen could form covalent bonds with several hydrogen atoms, forming a molecule of ammonia. What would be the molecular formula for ammonia?