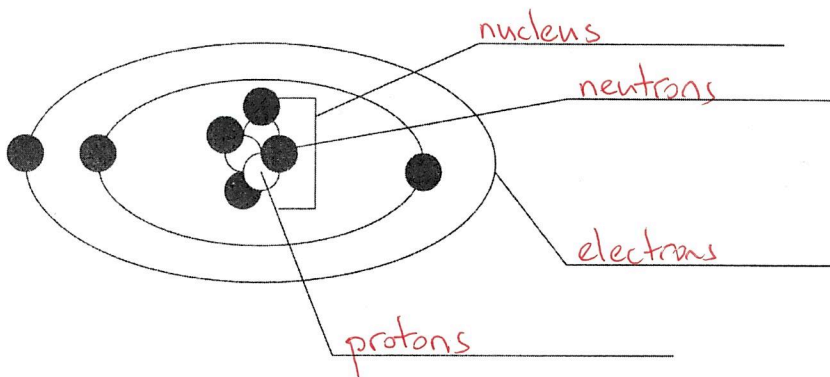


# Subatomic Particles and Bohr Model Worksheet

Part 1: Label the parts of this atom (nucleus, protons, electrons, neutrons).



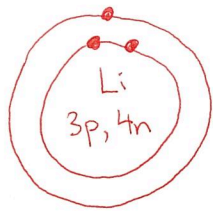
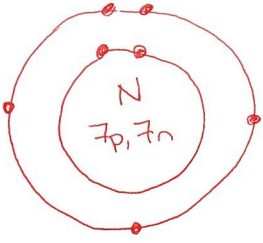
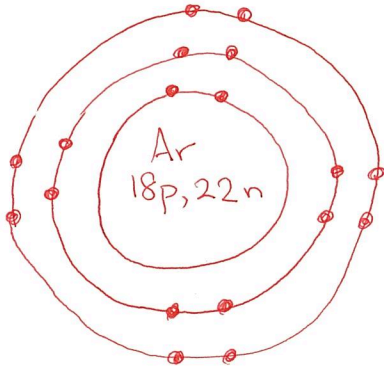
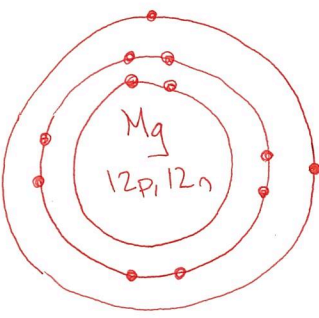
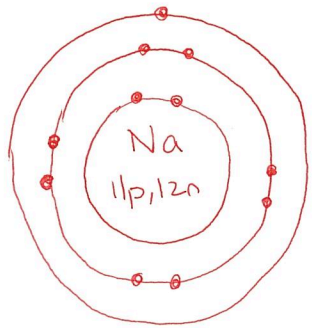
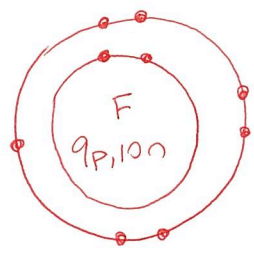
Part 2: Answer the following questions.

1. The subatomic particle with no electrical charge is the neutron; the subatomic particle with a positive charge is the proton; the subatomic particle with a negative charge is the electron.
2. In a neutral atom, there are the same number of these two particles: protons and electrons.
3. The atomic number ("element number") is the same as the number of protons.
4. Where is most of the mass of an atom located? nucleus
5. Complete the following table.

| Element Name | Element Symbol | Atomic Number | Mass Number | Number of Protons | Number of Neutrons | Number of Electrons |
|--------------|----------------|---------------|-------------|-------------------|--------------------|---------------------|
| Sodium       | Na             | 11            | 22.9        | 11                | 12                 | 11                  |
| potassium    | K              | 19            | 39.1        | 19                | 20                 | 19                  |
| strontium    | Sr             | 38            | 87.6        | 38                | 50                 | 38                  |
| calcium      | Ca             | 20            | 40.1        | 20                | 20                 | 20                  |
| Magnesium    | Mg             | 12            | 24.3        | 12                | 12                 | 12                  |
| bromine      | Br             | 35            | 79.9        | 35                | 45                 | 35                  |
| Aluminum     | Al             | 13            | 27.0        | 13                | 14                 | 13                  |
| manganese    | Mn             | 25            | 55          | 25                | 30                 | 25                  |
| barium       | Ba             | 56            | 137.3       | 56                | 81                 | 56                  |
| chlorine     | Cl             | 17            | 35.5        | 17                | 19                 | 17                  |

Depending on your periodic table, this may be 18.

6. The atomic number is the number of protons in one atom of an element. It is also the number of electrons in a neutral atom of that element. The atomic number gives the "identity" of an element. No two different elements will have the same atomic number.
7. In order to calculate the number of neutrons, you must subtract the atomic number from the atomic mass (or "mass number")
8. \* Chemical reactions involve the sharing and giving of electrons. The number of electrons in an element determines its chemical properties.
9. \*Nuclei can be split in chemical nuclear reactions, releasing massive amounts of energy.
10. Draw Bohr models for the following:

|   |  |   |
|---|--|---|
| <p>Lithium (Li)</p>     | <p>Nitrogen (N)</p>  | <p>Argon (Ar)</p>     |
| <p>Magnesium (Mg)</p>  | <p>Sodium (Na)</p>  | <p>Fluorine (F)</p>  |

Reminder: Bohr Model Rules:

- First, determine how many protons, neutrons, and electrons
- In the nucleus, write or draw the number of protons and neutrons, *and the element symbol*
- Electrons are placed in shells (and can be represented by dots ●)
  - Shells are filled from inside to outside until you run out of electrons
  - Fill shells clockwise (starting at the top), singly then in pairs
  - Maximum electrons per shell from inside to outside: 2, 8, 8, 18