Worksheet: Electron Distributions **Name**_____

1. There are four types of orbitals:
   - **s :** shaped like a _____
     An E level can contain only _____ s orbital, making up the "s sublevel".
   - **p :** shaped like _____
     An E level can contain _____ p orbitals, making up the "p sublevel".
   - **d :** shaped like double dumbbells
     An E level can contain _____ d orbitals, making up the "d sublevel".
   - **f :** too complex to draw or describe
     An E level can contain _____ f orbitals, making up the "f sublevel".

2. Each orbital can hold a maximum of _____ electrons. Since both electrons have a _____ charge, they _____. What keeps them from flying apart?

   Each electron _____ on its axis. One spins _____ and the other spins _____. When charged particles spin, they act like tiny magnets. Since the two electrons spin in _____ directions, one acts like the north pole of a magnet and the other acts like the south pole. This makes the electrons _____ .

3. Since each orbital can hold _____ electrons:
   The "s sublevel" can hold _____ electrons.
   The "p sublevel" can hold _____ electrons.
   The "d sublevel" can hold _____ electrons.
   The "f sublevel" can hold _____ electrons.

   We use this notation to describe an electron:

   main _____ level → $3p^5$ ← # of e- in _____

   _____

   How are electrons distributed within a sublevel?

   According to Hund's Rule, each _____ within a sublevel is half-filled before any is _____.

We draw **orbital diagrams** to show the distribution of electrons in a sublevel. Circles are used to represent the individual _____. _____ are used to represent electrons in the orbital. The first electron in an orbital is represented by a ↑ and the second by a ↓.

A set of four _____ numbers is assigned to each _____ to describe its energy and location within the atom. The quantum numbers use the symbols _____, _____, _____, and _____.

_____ is the principle quantum number and represents the _____ level of the electron.
_____ represents the sublevel of the electron, which depends on the type of _____.

Pauli's Exclusion Principle states that within an atom, no two electrons can have the same set of _____ _____. If two electrons have the same n, l, and m numbers, they are in the same _____ level, the same _____, and the same _____. They must then have _____spins! So, the s quantum numbers must be different.

Practice: Write electron distributions and do the orbital notation for the following:

1. P :

2. Ca:

Only do the electron distributions for the following:

1. Co:

2. Eu:

3. Tc: