**Ligand Lineup**

Before class review the following:

Orbital diagrams for ions and molecules such as F-, NH3 and CO

The effect of the σ-donating, π-donating and π-accepting ability of the ligands on the energy difference between the *d* orbitals (∆) of a coordination complex

During class:

**Part 1:**

My ligand is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Rank the ability (strong, medium, weak, none) of your ligand in each of the following categories and justify your answer using concepts such as orbital theory and electronegativity. Go over your answers with a partner.

σ-donor -

π-donor -

π-acceptor -

**Part 2:**

As a class, line up in order from weakest to strongest field ligand. You can talk to each other but cannot use any other resources.

**Part 3:**

Once we have compared your answers to the known spectrochemical series, all π-donors should take a step back, π-acceptors should take a step forward and those who are only σ-donors should stay in place. How do these factors affect a ligand’s place in the spectrochemical series?

**Part 4:**

With a partner, use a molecular orbital diagram for an octahedral molecule to compare how each of your ligands will affect the energy difference between the d orbitals (∆) of a coordination complex.