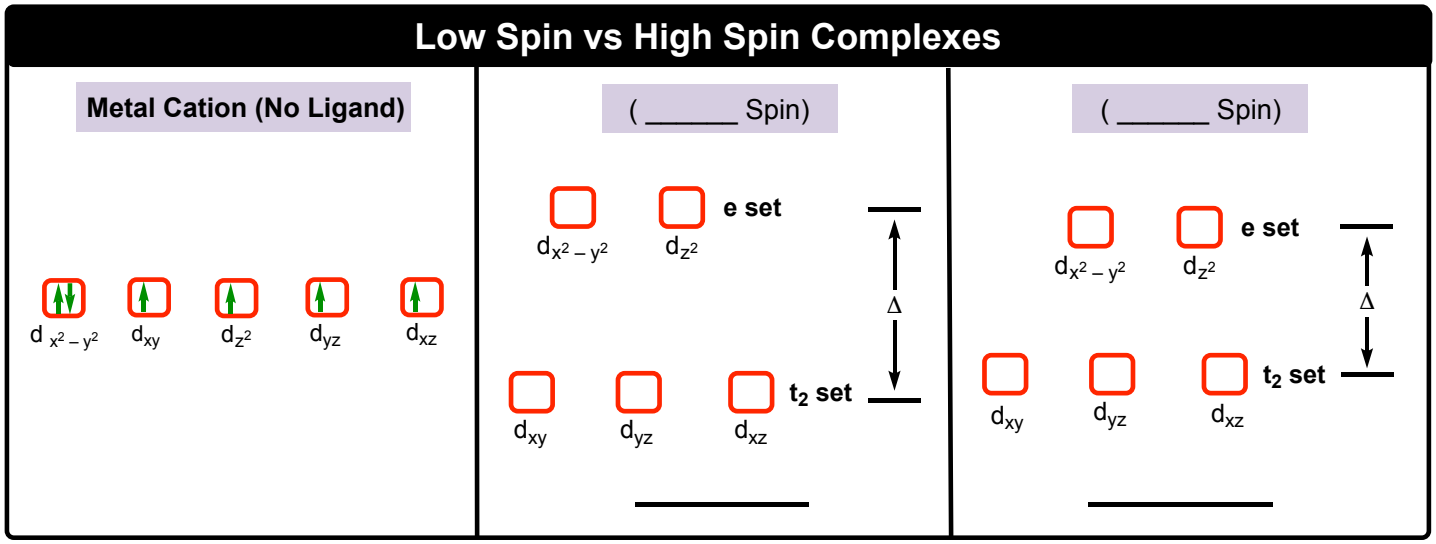
CONCEPT: MAGNETIC PROPERTIES OF COMPLEX IONS

- The magnetic properties of complexes depend on how the transition metal valence electrons fill d orbitals.
  - □ **Large Δ:** _____ energy orbitals fill first = Low-spin complex.
  - □ **Small Δ:** Orbitals are treated as _____ = High-spin complex.



Tetrahedral and Square Planar Complexes

- Finding tetrahedral and square planar geometries helps to determine the low vs high spin of complexes.
  - □ Square Planar = _____ **Δ** = _____-spin complex = _____.
  - □ Tetrahedral = _____ **Δ** = _____-spin complex = _____.

EXAMPLE: Determine the geometry and spin of the following complex ion: $[PdBr_4]^{2-}$.

PRACTICE: Determine if the following complex ion is either paramagnetic or diamagnetic: $[CoF_4]^{2-}$.