



[Type text]

$d_{z^2}$

$d_{yz}$

$d_{x^2-y^2}$

3. Consider that the five  $d$ -orbitals of an octahedral molecule split into two sets. Apply your answer to the JIT question and reasoning in Question 2 in order to create the CFT  $d$ -splitting diagram for  $ML_6$ . Provide 1–2 sentences describing how your group used your answers in the previous question to determine your orbital ordering.

Transfer your splitting diagram to your group whiteboard to share with the class.

[Type text]

### **Assessment of Learning**

Each member of your group should answer the assessment question *individually* on your notecard.

Predict how the octahedral splitting diagram changes when the bonds along the z-axis are lengthened (i.e. tetragonal elongation)? Your answer should include:

- Evaluation of how the interaction of each orbital with the ligands changes relative to an octahedral molecule. How does this change in interaction alter the energies in your diagram?
- A splitting diagram showing the ordering and energy of each orbital relative to your octahedral diagram