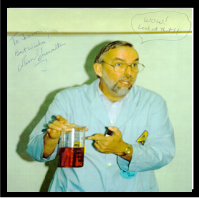


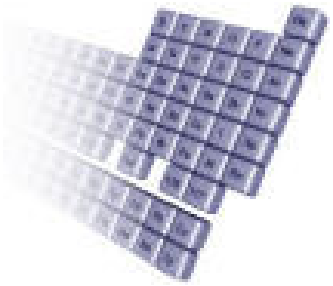
CHEMISTRY LAB

Electrons: Quantum Numbers

3-D MODEL QUANTUM NUMBER ACTIVITY

- **MATERIALS**

Quantum Model Kit



- **PROCEDURE**

1. Assemble the 3-piece stand that includes clear base, clear crossbar, and upright pole.
2. For **hydrogen**, place blue **1s** orbital on the crossbar. Place one electron on 1s orbital. Answer questions for hydrogen.
3. For **helium**, add second electron to blue **1s** orbital. Answer questions about helium.
4. For **lithium**, add red **2s** orbital on top of blue 1s orbital. Add one electron to red 2s orbital. Answer questions about lithium.
5. For **beryllium**, add second electron to red **2s** orbital. Answer questions about beryllium.
6. For **boron**, place yellow **$2p_x$** orbitals in slots located in red 2s orbital. Add one electron to the $2p_x$ orbital. Answer questions about boron.
7. For **carbon**, place green **$2p_y$** orbitals in slots located in red 2s orbital. Add one electron to the $2p_y$ orbital. Answer questions about carbon.
8. For **nitrogen**, place pink **$2p_z$** orbitals in slots located in plastic crossbar. One should go above the crossbar and the other should go below. Add one electron to the $2p_z$ orbital (one side should stick). Answer questions about nitrogen.
9. For **oxygen**, add second electron to the yellow **$2p_x$** orbital. Answer questions about oxygen.
10. For **fluorine**, add second electron to the green **$2p_y$** orbital. Answer questions about fluorine.
11. For **neon**, add second electron to the pink **$2p_z$** orbital. Answer questions about neon.

READ ALL INSTRUCTIONS BEFORE PROCEEDING

11. For **neon**, add second electron to the pink **$2p_z$** orbital. Answer questions about neon.

12. Admire beautiful model with pride and carefully take it apart and put it into the bag.

13. Fill in table of elements with their electron configurations, valence levels, and number of valence electrons.

14. Complete the table of energy levels, sublevels, orbitals, and electrons

15. Complete orbital diagrams for the four atoms listed. One line represents an orbital. An arrow represents an electron spinning in a direction.