BIO 26 PAL Worksheet
Week 1 (#2): Cardiovascular Anatomy

Pretend you are a sodium ion in a bag of isotonic saline solution. When a nurse hooks up the IV bag to a catheter she placed into the vein of a hypovolemic (decreased blood volume) patient's wrist, your wild journey through the cardiovascular system begins…

A. On the white board, make an overview drawing that traces your path from the patient's vein of the wrist through the heart, the pulmonary and systemic circulation, back to the wrist. Include all important blood vessels, heart chambers, valves, and other significant structures you can think of.

B. Compare and contrast the differences in length, resistance, pressure, and volume of blood carried per minute for the systemic vs. pulmonary circuit.

C. On your endless journey through the pulmonary and systemic loops, you notice a general vascular pattern. What do you know about the general differences between arteries vs. capillaries vs. veins? You also notice that for the most part capillary beds are arranged in parallel in the body, rather than in series. And you have a good explanation why that might be….

D. On your journey through the body, you befriend a red blood cell, wearing big baggy pants. You find out that your friend carries O_2 in his front pockets and CO_2 in his back pockets. Describe what you witness happening in the pulmonary vs. systemic circulation in terms of O_2 and CO_2 transport by your friend.

E. BONUS: You're very glad you learned so much about cardiovascular system anatomy. And are a little proud that you, the little sodium ion, contributed to saving the patient's life by helping expand their blood volume. Explain to your friend the Red Blood Cell why having low blood volume is so dangerous for a patient.