Circulatory Worksheet

- What structures are associated with the cardiovascular system?
- What are the functions of the cardiovascular system, in general?
- What is blood in its most concise biological terms? What is the function of blood? What are the general components of blood?
- Where is the heart physically located and what is its size and orientation in the body?
- What is the primary function of the heart?
- What are the three layers of the heart wall and what is each layer composed of?
- There are three layers of pericardium surrounding the heart, what are they and what are their functions?
- There are four chambers in the heart, what are they and how are each divided from one another?
- Where are the divisions located on the external surfaces of the heart and what are their functions?
- What are the functions of the atria? The ventricles? The great arteries and veins to and from the heart?
- How does blood flow into the heart, through the heart and out of the heart and what structures allow blood to flow in the particular direction it flows?
- What and where are the 4 major heart valves? Their structure? How do they function?
- The heart supplies blood and plasma to two distinct types of circulatory systems, what are they and what are the functions of both?
- How does the heart receive nutrients and oxygen? How does it get rid of carbon dioxide and wastes?
- What are the key similarities and differences of cardiac versus skeletal muscles?
- How does cardiac muscle tissue most effectively make ATP? What are other options available?
- The heart has special cells that can readily depolarize without external initiation. Where are these cells located within the heart? How do they depolarize?
- After depolarization of the pacemaker cells, how does the action potential travel to other cells? Where does the action potential go in the atria? The ventricles?
- How does nervous tissue interfere with the ability of the heart to beat?
- Does the entire heart beat in unison or is there a division where one part beats and then the other?
- What is meant by systole and diastole?
- Can you predict when the various parts of the heart will beat? If so, then how?
- What events are occurring during each one of these phases of the electrocardiograph (ECG): T-P, P, P-Q, Q-S, S-T, T. What happens after the T phase?
- On an ECG, there is a wave that should be present, but is indeed absent. Which wave is this and why is it absent?
- What is the cardiac cycle? How or why do events in the cardiac cycle happen?
- What is cardiac output and how is cardiac output measured?
- How is stroke volume regulated?
- How is heart rate regulated by the nervous system? By chemical regulation?
- How did the heart develop? What are the purposes of the foramen ovale and ductus arteriosus? What happens to them upon birth?
- What are the major disorders and dysfunctions of the heart?
- As blood leaves the heart, where does it go? Which vessels (and in what order) does blood flow after it leaves the heart and before it reenters the heart?
- What is the structure, function and classifications of an artery? How do the large arteries receive nutrients?
- What is meant by vasoconstriction and vasodilation and what causes this to happen?
- What is the structure and function of an arteriole?
- What is a capillary, how are they organized and what are their functions?
- What is the size of a capillary?
- What is a thoroughfare channel?
- How does a capillary perform its primary functions and how are capillary beds regulated?

- What are the types of capillaries and what are their general locations and functions?
- What is the structure and function of a venule? What is special about a post-capillary venule?
- What is the structure and function of a vein?
- Do veins, other than merging, connect? And, if they do, what might these connections be called and what would they allow to happen?
- How is blood pressure in the vessels created?
- How is blood pressure in the vessels maintained?
- How is blood pressure in the vessels measured?
- What are the blood pressures in the arteries? Meta-arterioles? Post-capillary venules? Veins?
- What pressures in capillaries allow for fluid and solute flow?
- How is blood returned to the heart?
- What are the major disorders or dysfunctions of blood vessels?
- What are the ways in which blood may not circulate well enough to supply the tissues and cells with adequate levels of nutrients and oxygen?
- What is blood? Where can it be found?
- What are the components of blood?
- What are the physical characteristics and volumes of blood?
- What are the basic functions of blood?
- Where do blood components come from during development? As a youth? As an adult?
- If you centrifuge blood, you get three layers. What are those three layers? What is in those 3 layers?
- What is the structure, development and function of an erythrocyte?
- How is oxygen carried by an erythrocyte?
- What is erythropoiesis and how is it regulated?
- What are the dietary requirements needed for erythropoiesis to occur?
- What are disorders associated with erythropoiesis?
- What are leukocytes? What are the kinds of leukocytes and what does each do?
- How is leukopoiesis accomplished and when might this happen?
- What are leukocyte disorders?
- What are platelets and how are they created?
- What function does a platelet have and what is the process of hemostasis?
- What are disorders of hemostasis?
- What are the human blood groups and how do they occur? What is the result of incompatible blood transfusions?
- What are special issues related to transfusions and blood replacement?
- Overview: Blood collected from the inferior and superior vena cavae and the coronary sinus go where? How?
- Overview: Is this blood oxygenated or deoxygenated?
- Overview: Blood then flows from the right atrium into the right ventricle through this device?
- Overview: The P wave occurs, and then what happens next?
- Overview: What is the status of the pulmonary semilunar valve and the tricuspid valve at this time?
- Overview: The right ventricle fills with blood and pressure and volume inside the ventricle increase. What happens with the valves now?
- Overview: What keeps the tricuspid valve from shooting (inverting) into the right atrium during this time?
- Overview: At the end of this time period before the ventricles contract, there is a volume of fluid inside the right ventricle. This is called the?
- Overview: Pressure increases and the QRS wave begins. What happens now? What is happening in the atria at this time?
- Overview: The T wave occurs and volume and pressure inside the ventricle drops. What is the volume of blood not ejected from the right ventricle called?

- Overview: What is the state of all valves at this time? When does the pulmonary semilunar valve close?
- Overview: What happened to the blood ejected from the right ventricle? What path does this blood take to get back to the heart?
- Overview: Where does this blood reenter the heart?
- Overview: What events occur with this blood in the left side of the heart?
- Overview: From the left ventricle, where does blood go?
- Overview: What is the path that blood takes to get back to the heart?
- Overview: What events are occurring between the blood and tissues and between the blood and lungs (alveoli)?
- Overview: If you were to be put ANYWHERE along either systemic or pulmonary circulation, including coronary circulation, could you make the circuit completely and find your way back to your starting position?