Unit 11 - Cardiovascular System
COS: 9

Schedule:
Monday 23 - Intro to Cardio, Structure and Function (May take 2 days)
Tuesday 24 - Trace flow of cardio system (veins and arteries)
Wednesday 25 - Components of Blood
Thursday 26 - Blood Cell Formation/Blood Groups/Donations
Friday 27 - Diseases & Disorders Research (Computer Lab)
Monday 30 - Diseases & Disorders Presentations
Tuesday 31 - Review for Test/Finish up Notes
Wednesday 1 - Cardio Test

Root Words: Cardio - Heart, Tachy - Rapid; Brady - Slow; Diastol - dialation; Systol - contraction

Notes:

Function of Cardiovascular System: To carry oxygen and nutrients to tissues in body and pick up waste in tissues to be exhaled through lungs

2 Branches of Cardiovascular System:
1) Pulmonary Circuit - Sends oxygen depleted blood to the lungs to pick up oxygen and unload carbon dioxide
2) Systemic Circuit - Sends oxygen rich blood and nutrients too all body cells and removes waste

Cardiovascular System is made up of many organs and tissues:
1) Heart - Serves as the "pump" to circulate blood; hollow, cone-shaped, muscular pump
2) Pericardium - Layer of tissue that surrounds the heart; folds back on itself and contains fluid to decrease friction during pumping
3) Epicardium - outer layer of the heart; protects heart by reducing friction
4) Myocardium - Thick middle layer of the heart, consists mostly of cardiac muscle tissue that pumps blood out of the heart chambers
5) Endocardium - inner layer of heart; contains epithelium, connective tissue and Purkinje fibers (continuous with the inner linings of blood vessels attached to the outside of the heart)
6) Purkinje Fibers - Set pace of contractions of heart (pacemaker)

Heart Chambers and Valves:
Heart is divided into 4 hollow chambers (two on left, two on right)
1) Atria - upper chambers of heart, receive returning blood to heart
2) Ventricles - lower chambers receive blood from atria and contract to force blood out of the heart into the arteries
3) Septum - separates the atrium and ventricles on the right from their counter parts on the left; blood from one side of heart never mixes with the blood on the other side

Blood Vessels:
1) Arteries - a vessel that transports blood away from the heart
2) Arterioles - a small branch in an artery that communicates with a capillary network
3) Capillaries - a small blood vessel that connects an arteriole and venule
4) Venules - a vessel that carries blood from a capillary to a vein
5) Veins - a vessel that carries blood towards the heart

Trace Pathway of Blood:
Blood low in oxygen/high in CO2 enters right atrium through vena cavae and coronary sinus - right atrial wall contacts - tricuspid valve - right ventricle - pulmonary valve - pulmonary trunk - pulmonary arteries - capillaries in lungs (gas exchanges) - pulmonary vein - left atrium - mitral valve - left ventricle - aortic valve - aorta - arteries - arterioles - capillaries - venules - veins - vena cavae

Components of Blood:
1) Red Blood Cells: (erythrocytes) biconcave discs that transport gases
2) White Blood Cells: (leukocytes) protect against disease
3) Blood Platelets: (thrombocytes) not complete cells; help close breaks in damaged blood vessels and initiate formation of blood clots
4) Blood Plasma: clear, straw colored liquid portion of blood in which cells and platelets are suspended; approximately 92% water

Blood Cell Formation:
Hematopoietic Stem Cell gives rise to every kind of blood cell. See page 306 and have students follow chart to understand how this one type of cell gives rise to all types of blood cells through differentiation.

Human Blood Types:
Type A: has only antigen A (41%)
Type B: has only antigen B (9%)
Type AB: has A & B antigens (3%)
Type O: has neither A or B antigens (47%)

Whenever an antigen is not present, the body produces anti-antigen substances, so Type A can's take Type B blood, and vice versa. Type AB can take all types of blood, but can only give to Type AB. Type O can give to anyone, but can only take Type O.

Rh Blood group can be dangerous for pregnant women. See Figure 12.19 on page 319.

List of Disorders of Students to Research:
Heart attack (myocardial infarction), stroke, high blood pressure, high cholesterol, aneurysm, mitral valve prolapse, varicose veins, arteriosclerosis