STUDY GUIDE: Circulation, Blood and Gas Exchange

KEY TERMS

Open circulatory system
Closed circulatory system
Trachae(in Insects)
Gills
counter-current exchange
Heart
Atria
Ventricles
arteries
Veins
Arterioles
Venules
Capillary
Double circulation
Pulmonary circulation
Systemic circulation
Heart cycle
Systole
Diastole
Pulse
AV node
SA node
Purkinje fibers
Blood pressure
Systolic pressure
Diastolic pressure
Blood
Plasma
Electrolytes
Formed elements
erythrocyte
leukocyte Granular
neutrophils
eosinophils
basophils
Agranular
lymphocytes
monocyte
Platelets
Blood clot
fibrinogen
fibrin
thrombus
respiratory surface
gills
tracheae
Lungs
Alveoli
Breathing center
Partial pressure
Hemoglobin

QUESTIONS

1. Compare the number of heart chambers in the classes of vertebrates. Why do the warm blooded vertebrates have a four chambered heart?

Classes Number of Chambers
Fish
Amphibians
Reptiles (except crocodilians)
Birds
Mammals

2. Describe how the mammalian heart beat is regulated. Include in your description the role of the SA node, AV node, bundle branches and Purkinje fibers.

3. Describe how respiratory gas levels are monitored in the blood and how these levels influence respiration.

4. Explain how oxygen and carbon dioxide are transported in the blood and the role hemoglobin plays in the process.

5. The principle of countercurrent exchange is important in heat exchange and gas exchange. Describe how countercurrent exchange maximizes oxygen transfer in fish gills.

6. What is the atmospheric pressure at sea level?_____mmHg
What is the partial pressure of oxygen (PO_2) at sea level?_____mmHg
Oxygen diffuses from areas of high/low partial pressure to areas of high/low partial pressure.

7. Why do animals use respiratory pigments to carry oxygen?