General properties of circulatory systems

a circ system has:

-circulatory fluid

-set of interconnection vessels

-muscular pump(s), the **heart**

3 chambered hearts of amphibians

The three chambered hearts of amph and nonavian reptiles are adaptive allowing variation in blood flow through the heart

blood

connective tissue

consists of cells suspended in liquid matrix called **plasma**

plasma ~55% cells~45%

plasma	water
cellular elements	leukocytes, platelets, and erythrocytes

Gas exchange and respiratory surfaces

gas exchange	supplies O2 for cellular respiration and disposes of CO2

occurs via diffusion

accomplished via large, moist resp surfaces between cells and medium

	things like skin, gills, tracheae, lungs

Circulatory Systems

open	closed

single and double circulation

single

fluid leaving heart travels to respir. organs and organ system before returning to heart

double

two different circuits

pulmonary: lung capillaries

systemic:body capillaries

parts of heart/circ system

arteries	carry blood AWAY from heart to pulmonary (deoxygenated) & systemic circuits (oxygenated)
veins	carry blood back to heart from pulmonary and systemic circuits
pulmonary circuit	pulmonary arteries
	pulmonary veins
systemic circuit	aorta
	superior and inferior vena cava

ventilation

breathing	process that ventilates the lungs; alternate inhalation and exhalation of air
	mechanisms vary across taxa

Closed Circulatory Systems

cardiovascular system

circulatory fluid: blood

interconnected vessels:	arteries, arterioles, capillaries, venules, veins
pump: heart	
gas exchange mechanism	gills/lungs
blood has to get to:	
respiratory tissue	pulmonary circuit
organ systems	systemic circuit

respiratory pigments

proteins that transport oxygen; greatly increase the amount of O2 that blood can carry

	hemoglobin, myoglobin, hemocyanin
hemoglobin	resp. pigment w/ high affinity for O2
Bohr shift:	co2 decreases pH and the affinity of hemoglobin for O2

hemoglobin can bind co2 but most is transported in plasma

Disorders of circ system

>50% of deaths in US

cardiovascular disease	disorder of heart and or blood vessels
atherosclerosis:	buildup of plaques in arteries
heart attack	blockage of 1 or more coronary arteries
stroke	rupture or blockage of arteries to brain
hypertension	high BP, increases risk of plaque buildup and heart attack

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