Biology 10 - Introduction to Biology
West Valley College - Norris

Circulation and Respiration

I. Definitions

A. Organ System

B. Respiration
- cellular
- systemic

II. Overview (What is the major function of the circulatory and respiratory systems?)

III. Circulatory System (or Cardiovascular System) = organ system

A. Diversity of Circulatory Systems

1. Open System (i.e. mollusks, arthropods...)

2. Closed System (most multicellular animals)

B. Functions = Physiology (*closed system in humans as our example*)
1. Transport

2. Protection
3. Homeostasis
4. *Movement*

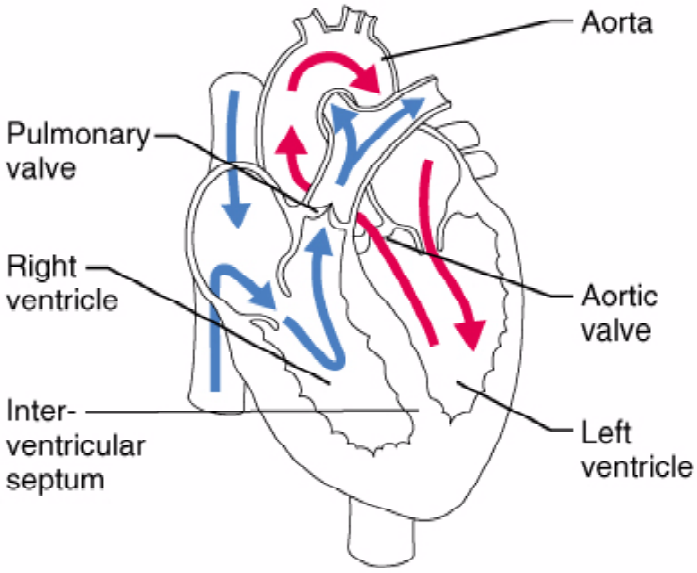
C. Structures = Anatomy (*closed system in humans as our example*)
1. Blood

a. Plasma

b. White Blood Cells (WBC, or Leukocyte)

c. Platelets
d. Red Blood Cells (RBC, or Erythrocyte)

2. Heart



3. Vessels
   a. Arteries
   b. Capillaries
   c. Veins

C. Lymphatic System

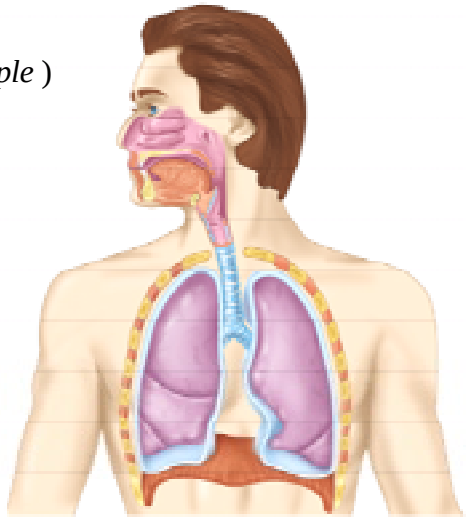
IV. Respiratory System (another organ system)

A. Diversity of Respiratory Systems
1. Integumentary Exchange
2. Tracheal Respiration
3. Gills
4. Lungs

A. Function = Physiology (*human respiratory system as our example*)
1. Ventilation

2. Gas Exchange

B. Structure = Anatomy (*human respiratory system as our example*)
1. Conduction Zone



2. Respiratory Zone

V. Control of Respiration
1. Local Controls

2. Systemic Controls

VI. Disorders of Respiration
A. Blockage of Airways (obstructive dissorder)

B. Damage to Respiratory Tissues (restrictive dissorder)

C. Reduced Oxygen Trasnsport

VII. Additional Selected Key Terms

alveoli	capillary	constriction	diastole	dilation	gradient
hemoglobin	hemostasis	interstitial fluid	phagocyte	stem cell	systole
ventilation					

Study Questions – Circulation & Respiration:

1. Define “organ system”.
2. Describe “cellular respiration” and “systemic respiration”. How are these two processes related.
3. What are the major functions of the circulatory system (aka cardiovascular system)?
4. What are the major functions of the respiratory system?
5. What major function is shared by both the cardiovascular and respiratory system?
6. Diagram a simple open circulatory system and a closed circulatory system. What advantage is there to a closed circulatory system?
7. What are the three basic components of the circulatory system? What is the basic role of each?
8. How much of the blood is plasma? What is plasma? What is its significance?
9. How much of the blood is composed of cells? What are the three different cell types found in blood?
10. What do the different cells in the blood do? Which type is most common?
11. What is the primary function of the heart?
12. What is the function of the atria? Of the ventricles?
13. What is the function of the valves? What causes the valves to open and close?
14. a. Diagram and describe the flow of blood through the heart, naming all of the chambers and valves along the way.

    b. Add to your diagram a description of where the blood leaving the heart goes and where the blood entering the heart comes from. Name the blood vessels and describe the oxygen content of the blood in each blood vessel and heart chamber.
15. How does oxygen get to the muscle of the heart itself?
16. Describe the three different types of blood vessels.
17. What is the function of the lymphatic system?
18. All respiratory systems are limited by the fact that the respiratory surface (where gas exchange takes place) must remain wet. Describe the different types of respiratory systems and how each meets this need. Compare each in terms of efficiency.
19. What is the oxygen in inhaled air used for? Where does exhaled carbon dioxide come from?
20. What is the difference between ventilation and gas exchange?
21. What are the functions of the nose?
22. What prevents food from entering the airways during swallowing?
23. Where does gas exchange take place? From where to where?
24. How is respiration controlled locally? Systemically?
25. Describe the different types of dissorders of respiration.

“There is one thing even more vital to science than intelligent methods; and that is, the sincere desire to find out the truth, whatever it may be."
Charles Sanders Pierce