

Name _____

Period _____

AP Biology

Date _____

RAVEN CHAPTER 44 GUIDED NOTES: CIRCULATION & RESPIRATION

Circulation

1. Why aren't diffusion and active transport sufficient for transport in multicellular animals?

2. Briefly describe circulation in the cnidarians and flatworms

3. Compare the circulatory systems of higher animals.

a. Open _____

Who has one? _____

b. Closed _____

Who has one? _____

4. List and describe the three principal functions of the vertebrate circulatory system.

a. _____

b. _____

c. _____

5. Briefly describe the components of the blood.

- a. Plasma _____
- b. Erythrocytes _____
- c. Leukocytes _____
- d. Platelets _____

6. Compare the structure of each vessel. Pay particular attention to structure-function correlations:

- a. Artery _____

- b. Capillary _____

- c. Vein _____

7. How do precapillary sphincters help regulate capillary blood flow, blood pressure, and body temperature?

8. What happens to blood pressure and velocity as the blood flows through:

- a. Artery _____
- b. Capillary _____
- c. Vein _____

9. If blood pressure in veins is so low, how does blood return to the heart from the legs?

10. Discuss the role of the lymphatic system in returning interstitial blood to the circulatory system. Discuss the role of osmosis in the movement of fluid between capillaries and interstitial fluid

11. What is the adaptive value of the four chambered heart?

12. Answer the following regarding the structure of the human heart.

- a. Which side is oxygen rich _____ ...oxygen poor _____
- b. Which chambers create the blood pressure in the arteries? _____
- c. What causes the heart sounds? _____

13. How is heart rate regulated? _____

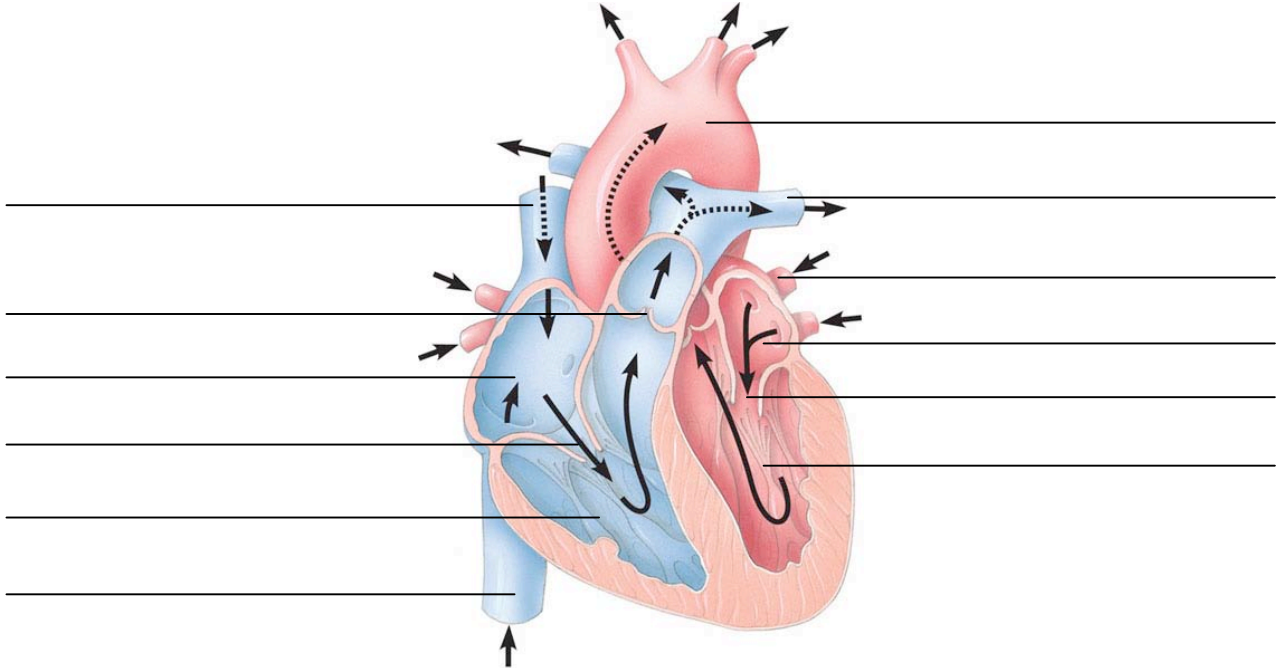
14. Discuss the homeostatic regulation of blood pressure and the role of:

- a. baroreceptor reflex _____
- b. ADH _____
- c. aldosterone _____

d. atrial natriuretic hormone _____

e. nitric oxide _____

15. Label the diagram of the heart.



16. Describe the types of **cardiovascular diseases** that are leading causes of death in US:

a. Stroke _____

b. Heart attack _____

c. Atherosclerosis _____

d. Arteriosclerosis _____

17. Discuss the role of zymogens in blood clotting. _____

18. Hypothesize why clotting is referred to as a “cascade reaction”.

Gas Exchange

19. Describe the relationship of the respiratory surface to the transport (circulatory) system.

20. Through what process do gases move across the cell membrane?

21. What are two characteristics typical of a respiratory surface?
a. _____
b. _____

22. Why must all animals constantly move either water (for aquatic animals) or air (for terrestrial animals) across their respiratory surface

23. How do partial pressures of gases influence the exchange of gas?

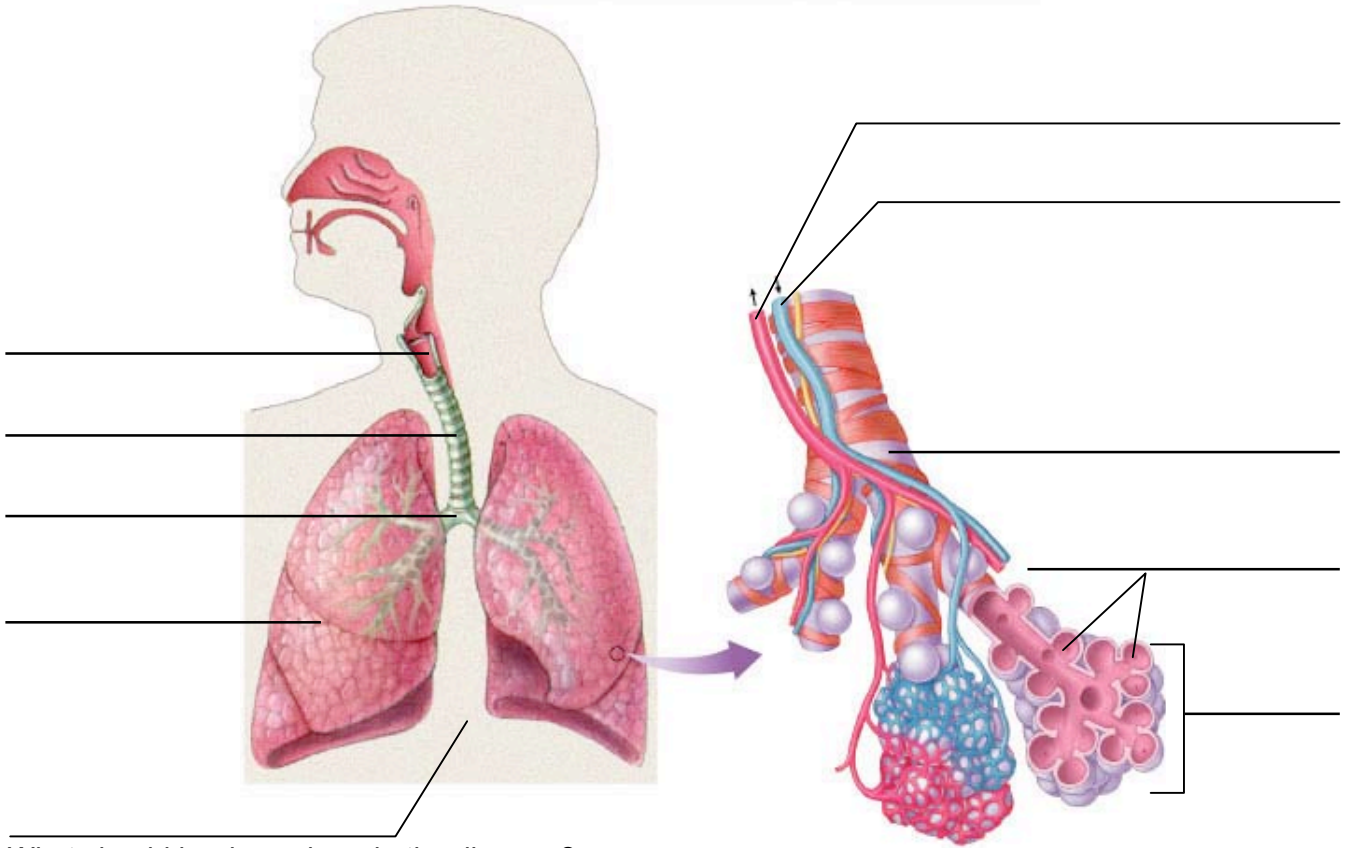
24. Why do terrestrial animals have internal respiratory surfaces?

25. What is countercurrent about the function of a fish's gills?

26. What adaptive value is the countercurrent exchange system of gills?

27. List some features that show how tracheal tubes and lungs are adapted for gas exchange?

28. Label the diagram of the human respiratory system.



What should be drawn here in the diagram?

29. What is the role of the alveoli?

30. Describe how breathing is regulated. Include the role of each of the following.

a. medulla _____

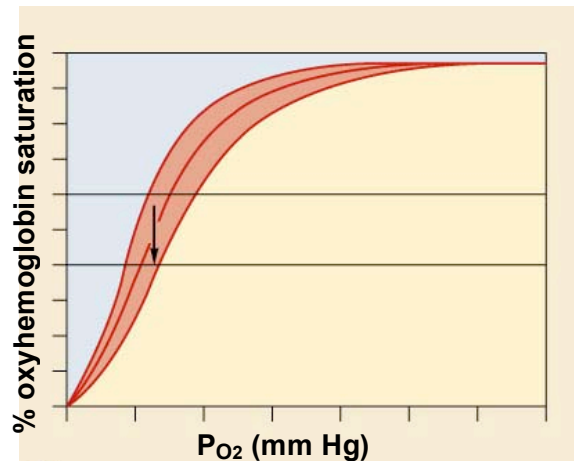
b. pH _____

c. carotid & aortic arteries _____

31. Explain the mechanics of human breathing. How does the diaphragm enable breathing?

32. What is the adaptive value of hemoglobin?

33. Review the dissociation curves for hemoglobin. Explain what they illustrate.



34. How does lowering pH influence oxygen release from the blood?

35. Why does oxygen leave the hemoglobin when it passes through the resting tissues?

36. How is CO₂ carried in the blood?

37. Outline the reactions showing the path of carbon dioxide produced in body cells, then transported as bicarbonate ion in the plasma, to the carbon dioxide released into the alveoli.
