

Name: _____

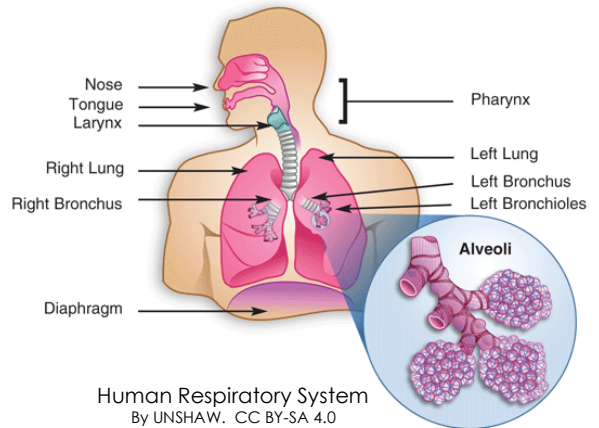
Date: _____ Period: _____

Circulatory and Respiratory Systems

Crash Course Biology #27

1. Big Idea: All members of the kingdom Animalia need _____ to make energy. The respiratory and circulatory systems bring in oxygen from the air with our lungs, circulate it to all of our _____ with our heart and arteries, and collect the _____ that we don't need with our veins and dispose of it with the lungs when we exhale.
2. Some animals can take in oxygen without lungs by a process called _____, which allows gases to move into and pass through wet membranes.
 - a. Ex. arthropods – have pores all over their bodies
 - b. Ex. amphibians – can take in oxygen through their _____, also have lungs or gills
3. Why don't we use diffusion?
 - a. The _____ the animal, the more oxygen it needs.
 - b. Mammals and birds are warm-blooded, and regulating body _____ requires energy and oxygen.
 - c. Membranes must be _____ for oxygen to pass through.
4. Fish absorb oxygen that's already dissolved in the water through their _____.
5. Lungs have oxygen-dissolving membranes that are kept moist with mucus. Lungs have a high _____ to absorb a lot of oxygen at once (about 75 m² or _____ ft²).

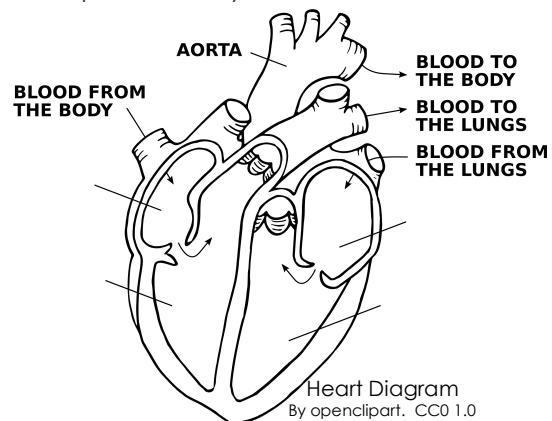
6. Add arrows and label the trachea and right bronchioles on the diagram at right.
7. Alveoli are little bags of thin, moist membranes that are covered in tiny blood-carrying _____.
8. What two gases are exchanged at the capillaries?



9. The large flat layer of muscles that sits right underneath the lungs called the _____.
 - a. At the end of an exhalation, your diaphragm is _____ and arc-shaped.
 - b. When you breathe in, the diaphragm _____ and flattens out, allowing the lungs to open up.
 - c. As the volume of a container grows larger, the pressure inside it goes _____. As the pressure in our lungs goes down, air flows into them.
 - d. When the diaphragm relaxes, the pressure inside the lungs becomes _____ than the air outside, and the deoxygenated air rushes out. And that is breathing.
10. The _____ system moves oxygenated blood out of the lungs to the places in your body that needs it, and then brings the deoxygenated blood back to your _____.
11. So even though the heart does all the heavy lifting in the circulatory system, the lungs are the home base for the _____ that carry the oxygen and the CO₂.
12. Like air moves from _____ pressure to _____ pressure, so does blood.

P↓, V↑

13. A _____-chambered heart is set up so that one chamber, the _____, _____, has very high pressure.
14. From the left ventricle, the blood moves through the _____ and then through the _____ and blood vessels that carry the blood away from the heart to the rest of the body.
15. Arteries are muscular and _____-walled to maintain high pressure as the blood travels along. As arteries branch off to go to different places, they form smaller _____ and finally, the very little capillary beds which, through their huge _____, _____ facilitate the delivery of oxygen to all of the cells in the body that need it.
16. The _____ are also where the blood picks up CO₂. From there, the blood keeps moving down the pressure gradient through a series of veins. Veins flow together to make bigger and bigger _____ to carry the deoxygenated blood back to the heart.
17. Veins have thinner walls and have _____ that keep the blood from flowing backwards, which would be bad. This is necessary because the pressure in the circulatory system keeps dropping lower and lower until the blood flows into two major veins
- _____ vena cava – handles blood coming from the lower part of body
 - _____ vena cava – collects the blood from the upper body
18. Together, the venae cavae run into the _____ of the heart, which is the point of the lowest pressure in the circulatory system.
19. The deoxygenated blood flows into the _____ and then into the _____ (pulmonary means *of the* _____).
20. The blood makes its way to the alveoli and picks up some fresh oxygen, it flows to the _____, and from there it enters the heart again where it flows into the left atrium and then into the left ventricle, where it repeats the cycle.



21. On the diagram of the heart, label the left ventricle, vena cava, right atrium, right ventricle, pulmonary artery, pulmonary vein, and left atrium.
22. We are endotherms, meaning that we maintain a steady internal temperature.
- What are benefits of being an endotherm?
 - What are challenges that result from being an endotherm?
23. One of the signs of chordate complexity is the number of _____ in an animal's heart.
- Fish only have _____ chambers - one ventricle, one atrium; the blood gets oxygenated as it moves through the gills
 - Reptiles and amphibians have _____-chambered hearts - two atria, one ventricle; not all of the blood gets oxygenated every time; oxygenated blood gets pumped through the body and mixed with a little deoxygenated blood