Review Questions: Respiratory System

1. What are the clusters of sacs where gas exchange takes place?

2. What are the microscopic tubes that carry air into and out of the air sacs?

3. What are the net-like structures around the air sacs?

4. Why are there so many small air sacs in the lungs?

5. Draw a flow chart tracing the structures that air travels through as you exhale.

6. What is true about the capillary network surrounding each alveolus?

7. What could happen if the cilia lining the respiratory tract were damaged?

8. What structure is responsible for preventing food from entering into the lungs?

9. What two main conditions are necessary for respiratory surfaces to be efficient?

10. Asthma is caused by the inflammation of which part of the respiratory system?

11. Summarize the functions of the respiratory system.

12. Winter air can be very cold and dry. How would the air entering your lungs be different if you breathed through your mouth instead of your nose while walking to school on a cold winter day?

13. The air you exhale contains approx. 16.3% oxygen and 4.5% carbon dioxide. The air you inhale contains 21% oxygen and 0.04% carbon dioxide. What is the explanation for these differences between exhaled and inhaled air?

14. What are the functions of the nasal passages?

15. In a medical emergency, a doctor may insert a tube down a person's trachea to help him/her to breathe. Explain why the patient would not be able to talk while they have a tube in their trachea?

16. Some biologists refer to the system of bronchi and bronchioles as the "bronchial tree". Suggest an explanation for this metaphor.

17. What is the function of the tonsils?

18. What is one reason associated with respiration that makes it harder to concentrate in a closed, stuffy room?

19. Explain whether cases of pneumonia might increase or decrease with rising temperature and relative humidity.

20. You are watching a movie in which a doctor must perform an emergency procedure on a patient who has stopped breathing. The doctor inserts a sterile plastic tube into the patient's throat.

a. What structure in the throat is the doctor likely targeting?

b. How will this procedure help the patient?

Answers to Review Questions: Respiratory System

1. Alveoli
2. Bronchioles
3. Capillaries
4. To increase the area of the respiratory surface
5. Alveoli -> Bronchioles -> Bronchi -> Trachea -> Larynx -> Pharynx -> Nasal Passages -> Nostrils
6. It helps increase the surface area for the exchange of gases
7. More foreign particles could enter the airways
8. Epiglottis
9. A1: A moist surface so that oxygen and carbon dioxide can be dissolved. A2: A large surface area to meet the body's needs
10. Bronchioles
11. Ensures that oxygen is brought into the body and made available to each cell that needs it, AND ensures that carbon dioxide can leave each cell and be removed from the body
12. Breathing through your mouth would result in the cold, dry air entering your lungs more quickly. This would reduce the effectiveness of the gas exchange as the respiratory surface would then be cooled and dried. However, the air entering through your nose would be warmed and would take on more moisture as it would spend more time in the nasal cavity, which in turn would improve the efficiency of the gas exchange within the lungs
13. : The percentage of oxygen breathed out is less than that breathed in because some of the oxygen has diffused into the circulatory system. The percentage of carbon dioxide breathed out is higher than that breathed in because waste carbon dioxide has been expelled from the body
14. To warm, moisten and filter the air
15. Because the doctor would cut in the region below the larynx, and therefore air would not pass through the larynx over the vocal cords. Instead, the air would exit the trachea through the tube below the larynx
16. Like a tree, the bronchi start from a single "trunk", the trachea. The bronchi then branch into a great number of secondary bronchi that eventually lead to bronchioles. Also similar to a tree, gas exchange occurs in the "leaves" or alveoli of the lungs.
17. The tonsils trap bacteria and other harmful substances preventing them from entering the respiratory tract
18. A closed stuffy room likely has a lower concentration of oxygen. Hence the cells are less able to provide the energy that we need to concentrate
19. Cases of pneumonia would increase with rising temperatures and relative humidity because warm, moist conditions allow pneumonia – causing bacteria to thrive and spread easily from person to person
20. (a) The trachea (b) This would allow air to enter directly into the trachea, thus removing any blockages in the mouth or throat