Respiratory System Worksheet

Section A: Respiratory Webquest – part 1
Click on “Respiratory” link and answer the questions.

1. What is the major function of the respiratory system?

2. “A variety of physiological needs have to be met in order to remain healthy and these include maintaining the right amounts of oxygen and carbon dioxide in the internal environment and maintaining the right volume of fluids which contribute to sustaining blood pressure.” Explain how the two systems – respiratory and cardiovascular – are closely integrated and respond to changes in the body.

3. What occurs in the body if the oxygen needs are not met?

4. The components of the respiratory system are responsible for:
   a. ___________________________________________________________
   b. ___________________________________________________________
   c. ___________________________________________________________

5. Fill in the missing terms.
   Air enters the respiratory system through the __________ and the __________. The air then passes through the __________ (where speech sounds are produced) and the __________ which is a tube that enters the thorax. In the thorax, the trachea splits into two smaller tubes called the __________. Each bronchus then divides again forming the __________. The bronchial tubes lead directly into the lungs where they divide into many smaller tubes which connect to tiny sacs called __________.

6. The intercostal muscles are muscle in the chest wall found between the ribs and the diaphragm. What is the function of the intercostal muscles?

7. Study the online diagram and practice the labeling exercise. Use the information to help you label the diagram below.
8. There are two pleural membranes surrounding each lung. The parietal pleura lines the ____________________________. The visceral pleura covers the ____________________________. What is the function of the fluid found between each pleural layer? ____________________________

Nasal Cavity
9. What are the functions of the nose? __________________________________________________________

10. What’s the function of the respiratory mucosa lining the nasal cavity? ____________________________

11. The ciliated epithelium can be found in the nasal cavity. What other locations in the respiratory tract can you find ciliated epithelium? ____________________________

12. What is the function of cilia in the respiratory tract? ____________________________________________

13. What happens when you breathe in dry or cold air? ____________________________________________

14. How does smoking affect cilia? ____________________________________________________________

15. What other situations or disorders could affect the ability of the mucosa or cilia in the respiratory tract? ____________________________________________________________

16. What in the nasal cavity is responsible for smell? ____________________________________________

Section B: Upper Respiratory Tract
1. What is the function of the nasal conchae? ______________________________________________________

2. What is the function of the paranasal sinuses? __________________________________________________

3. What is the pharynx commonly called? ______________________________________________________

4. What is the function of the pharynx? __________________________________________________________

5. What are the 3 parts of the pharynx? __________________________________________________________

6. The Eustachian tube opens into the nasopharynx. What is the function of the Eustachian tube? ____________________________

7. What is the function of the tonsils? __________________________________________________________

8. What is the larynx commonly called? ________________________________________________________

9. What are the functions of the larynx? _________________________________________________________

10. Vocal cords are fibrous bands found in the larynx. How do vocal cords produce sound? ____________________________

11. What type of cartilage is found in the larynx? __________________________________________________

12. What is the function of the epiglottis? _________________________________________________________

13. What causes our voices to have different tones? ________________________________________________

14. Why are male voices typically deeper than females? ____________________________________________

15. What is laryngitis? What causes it? __________________________________________________________
Section C: Respiratory Webquest – part 2
Click on "Respiratory" link, then click on 'Respiratory Tree’ on the left side --- answer the questions.

**Respiratory Tree**

1. "The bronchial tree consists of the branched airways leading from the trachea to the microscopic airways in the lungs." Scroll over the parts of the bronchial tree and explain the structure of each part.

<table>
<thead>
<tr>
<th>Part</th>
<th>Structure Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trachea</td>
<td></td>
</tr>
<tr>
<td>Bronchus</td>
<td></td>
</tr>
<tr>
<td>Bronchiole</td>
<td></td>
</tr>
<tr>
<td>Alveolar Ducts &amp; Alveoli</td>
<td></td>
</tr>
</tbody>
</table>

2. What tissue lines the trachea, bronchi and larger bronchioles? _________________________________
3. What cells form the mucus? _________________________________
4. What tissue lines the smaller bronchioles? _________________________________
5. What tissue lines the alveolus? _________________________________
6. How are the bronchioles different from the bronchi?
   a. ____________________________________________________________
   b. ____________________________________________________________
   c. ____________________________________________________________
7. What is bronchoconstriction? __________________________________________________
8. What is bronchodilation? __________________________________________________________
9. Identify the factors that can lead to bronchoconstriction and bronchodilation.

<table>
<thead>
<tr>
<th>Bronchoconstriction</th>
<th>Bronchodilation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

Section D: Lower Respiratory Tract

1. What is the function of the trachea, bronchus and bronchioles? _________________________________
2. Explain how the bronchial tree branches. _____________________________________________________
   _____________________________________________________
   _____________________________________________________
3. Label the trachea, primary bronchi, secondary bronchi, tertiary bronchi, bronchioles and larynx.

4. Describe the structure of the alveoli. ____________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
5. What is the function of the alveoli? ____________________________________________
6. What is the function of the macrophages in the alveolar sacs? ______________________
7. Cuboidal cells in the alveoli produce surfactant. What is the function of surfactant? _____________
8. Follow a molecule of O₂ as it enters your nose and travels to the alveoli. ______________________
______________________________________________________________________________
9. What is the outermost layer of serous membrane that lines the thoracic cavity? __________
10. What is the innermost layer of serous membrane that comes in contact with the lungs? ____________
11. Label the apex, base and hilum on the diagram.
12. How many lobes make up the left lung? _______ How many lobes make up the right lung? _______
13. Why does the left lung have an indented area called the cardiac notch? ________________
14. What is the function of the diaphragm? ____________________
______________________________________________________________________________
Section E: Respiratory Webquest – part 3

Click on "Respiratory" link, then click on 'Ventilation' on the left side --- answer the questions.

**Ventilation**

1. What occurs during pulmonary ventilation (aka. breathing)?

2. Breathing is accomplished by movements of the ________________ and ________________ which inflate and deflate the lungs.

3. Watch the animation and explain what occurs when you breathe.

<table>
<thead>
<tr>
<th>Volume of chest cavity – due to contraction &amp; relaxation of muscles</th>
<th>Inspiration – air flows in</th>
<th>Expiration – air flows out</th>
</tr>
</thead>
</table>

4. What are the muscles used in breathing?

5. Fill in the chart.

<table>
<thead>
<tr>
<th>Inspiration – air flows in</th>
<th>Expiration – air flows out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercostal muscles (relax or contract)</td>
<td></td>
</tr>
<tr>
<td>Diaphragm (relax or contract)</td>
<td></td>
</tr>
<tr>
<td>Volume of the chest (increase or decrease)</td>
<td></td>
</tr>
<tr>
<td>Pressure of the lungs (increase or decrease)</td>
<td></td>
</tr>
</tbody>
</table>

6. Is respiration a voluntary or involuntary action?

7. What part of the brain is the respiratory center?

**Gas Exchange**

8. What is diffusion?

9. What is capillary exchange?

10. How are the alveoli efficient in gas exchange?

11. Are alveoli easily opened when they collapse?

12. What is surfactant and what is the function of this chemical?

13. Why is the production of surfactant detrimental to premature babies?

14. Copy the 6 statements that are TRUE.
   a. 
   b. 
   c. 
   d. 
   e. 
   f. 
15. Fill in the information about transport of gases.

<table>
<thead>
<tr>
<th>Gas</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td></td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td></td>
</tr>
</tbody>
</table>

16. Alveoli air is separated from the blood by a very thin __________________________. What takes place across this membrane? ____________________________

17. Oxygen diffuses into the __________________________ within the blood capillaries and is carried to the __________________________ attached to hemoglobin molecules. In the tissues oxygen diffuses from the red blood cells into the __________________________ and then into __________________________. Oxygen concentration in cells is low, so oxygen diffuses from the __________________________ to the __________________________ when it reaches the capillaries.

Section F: Respiratory Basics
Click on “Respiratory Basics” and answer these questions.
1. There are 4 steps that occur which supply the body with oxygen and dispose the carbon dioxide. Explain each step below.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation</td>
<td></td>
</tr>
<tr>
<td>External Respiration</td>
<td></td>
</tr>
<tr>
<td>Gas Transport</td>
<td></td>
</tr>
<tr>
<td>Internal Respiration</td>
<td></td>
</tr>
</tbody>
</table>

2. Why does oxygen leave the alveoli and enter the bloodstream? ____________________________

3. Why does carbon dioxide leave the blood and enter the alveoli? ____________________________

Section G: Inspiration/Expiration & Lung Volumes
1. Explain how pressure and volume change during inspiration. ____________________________

2. Explain how pressure and volume change during expiration. ____________________________

3. Pressure in the intrapleural space is normally __________________________. What happens if the intrapleural pressure becomes equal to atmospheric pressure? ____________________________

4. Explain the following terms.
   a) Tidal volume (TV) ____________________________
   b) Inspiratory Reserve Volume (IRV) ________________
   c) Expiratory Reserve Volume (ERV) ________________
   d) Residual Volume (R) ____________________________
   e) Vital Capacity (VC) ____________________________

5. How do you calculate your Vital Capacity?

6. What nerves and parts of the brain control respiration? ____________________________