Respiration Worksheet

- What are the functions of the respiratory system?
- What are the general structures associated with respiration?
- There are two general zones of respiration. What structures are involved in each zone and what is the purpose of both?
- Where are the lungs located? What holds them to their location?
- The lungs are covered by pleurae. What is the pleurae? What is it structure? Function?
- What is the nature of air surrounding you?
- What is the total pressure of air?
- What is partial pressure (Dalton's Law)? What are the partial pressures of nitrogen, oxygen and carbon dioxide in the surrounding air?
- Structure by structure, how is air inspired and what happens to the air as it is inspired?
- What is the substructure and overlaying tissues of the external nose?
- What is the first structure of the body in contact with inspired air? What happens to air as it passes through this structure?
- Upon entering the nasal cavity, the first internal structure associated with inspiration is the nasal vestibule. What is the epithelium of the nasal vestibule and what function does the vestibule perform?
- Further into the nasal cavity proper, what is the organization, but underlying and superficial? What specialized structures are apparent in the nasal cavity? What are the purposes for all structures in the nasal cavity?
- Trace the sense of smell from particle initially inside the nasal cavity to final destination in the brain.
- At what point does the nasal cavity end and the nasopharynx begin?
- What are the tissue layers of the nasopharynx from the lumen, out?
- What type of mucosa is found in the nasopharynx?
- What is the purpose of the pharyngeal tonsil and where is it located?
- Two small opening empty into the nasopharynx, where do they come from and what is their purpose?
- Is the nasopharynx a conducting or respiratory zone?
- Where does the nasopharynx become the oropharynx?
- What are the tissue layers of the oropharynx from the lumen, out?
- What type of mucosa is found in the oropharynx? Why is this type of mucosa beneficial?
- Supposing that air was inhaled via the oral cavity instead of the nasal cavity, what differs as far as the air is concerned?
- Is the oropharynx a conducting or respiratory passageway?
- At what point does the oropharynx become the laryngopharynx?
- What are the tissue layers of the laryngopharynx?
- What type of mucosa is found in the laryngopharynx?
- What are cilia and how do they function in the pharynx?
- Is the laryngopharynx a conducting or respiratory passageway?
- What goes down the esophagus? The larynx? What allows for either tube to be used?
- What are the tissue layers of the larynx, from the lumen, out?
- What type of mucosa lies superior to the vocal folds? Below the vocal folds?
- What are the various structures of the larynx and what are the primary functions of each?
- Is the larynx part of the conducting or respiratory zone?
- Air that leaves the larynx goes where? At what point does this transition occur?
- What are the tissue layers of the trachea? What is different between the anterior and posterior aspects of the trachea?
- What is the type of mucosa lining the trachea?
- Is the trachea part of the conducting or respiratory zones?

- At what part does the trachea end? What is special about this part and particles such as dust?
- What happens to the tubing system at the carina and where is the carina located?
- What is the basic tissue structure of the left and right primary bronchi? Type of mucosa?
- Where do the primary bronchi go? How?
- What is the basic overall organization to the external lung and how does that translate internally?
- What structure lines the external lung and what is its purpose?
- The primary bronchi branch inside the lung tissue to form secondary or lobar bronchi. What regions of the lung are serviced by the lobar bronchi? How many of them are in the right lung? Left Lung? Why?
- The secondary (lobar) bronchi divide further into tertiary or segmental bronchi. What area of the lung is serviced by segmental bronchi?
- Are the bronchi a conducting or respiratory pathway?
- The segmental bronchi branch again, then again, how many times does the bronchi branch until we get to an area that is different? What is happening to the size of the tubes as we continue to branch?
- What happens to the tissue layers as tube branching continues?
- What is the smallest level of bronchi called? Why?
- What would you imagine the tubing system looks like compared to the entire size of the lungs?
- Are the bronchioles conducting or respiratory zones? When does the conducting zone begin and end? When does the respiratory zone begin and end?
- The tiniest of bronchioles, the terminal bronchiole dumps into the respiratory bronchiole which transmits air into the alveolar ducts. What is the structure of alveolar ducts?
- Alveolar ducts lead into a cluster of sacs called alveolar sacs. What role does an alveolar sac (entire structure) have in respiration?
- Alveolar sacs are made up of alveoli (each individual grape of the cluster (sacs) of grapes. What are the 3 cells that make up the alveoli and what cell type are they? Where would you find each? Functions of each?
- If you were a dust particle inside a single alveoli, what would your surroundings look like? What is your location? What makes up the walls that confine you? Are there other ways out of your alveoli? What is on the other side of your walls?
- How did air get drawn into the alveoli in the first place?
- What is positive pressure? Negative pressure?
- How is negative pressure achieved in the lungs?
- How much of the inspired air actually makes it into the alveoli upon each breath? Why and what happens to the rest?
- What happens to the partial pressures of oxygen and carbon dioxide along the length of the conducting tubes? What would account for this drop or increase?
- What makes up the respiratory membrane? How do gases like carbon dioxide and oxygen get through the respiratory membrane?
- What is the path of blood, from right ventricle to left atrium, into and out of the lungs?
- What is the partial pressure of oxygen in the pulmonary capillaries coming into the lungs?
- What happens to circulation if an area of the lungs is not efficiently exchanging gases?
- Which direction is oxygen most likely to travel? Gas exchange between the alveoli and blood is called?
- How is oxygen transported by the blood (2 ways and what are the percentages of each)?
- What are the influences affecting how much oxygen is transported by a red blood cell?
- What is the partial pressure of oxygen in the blood leaving the pulmonary capillaries and entering systemic arteries?
- Blood is delivered to tissues, what process inside the tissue cells requires oxygen? What is the partial pressure of oxygen in the tissue cells themselves?
- What process inside cells creates the waste-product carbon dioxide? What is the partial pressure of carbon dioxide inside the tissue cells themselves?
- Which direction is oxygen likely to flow? Carbon dioxide? Why and how?

- We have delivered oxygen to the tissues. Exchanges of gases between the blood and tissues is called?
- What happens to circulation if a particular tissue area is not exchanging gases efficiently?
- How does carbon dioxide travel in the blood (3 ways with percentages of each)?
- What is the role of carbonic anhydrase in respiration? What 2 reactions are catalyzed by this enzyme?
- What is the partial pressures of carbon dioxide and oxygen in the blood leaving the tissues and then reentering the lungs?
- Remember that the partial pressure of carbon dioxide in the alveoli is 40 mmHg, which direction is carbon dioxide most likely to travel? What about bicarbonate (HCO_3^-)?
- What is the path of air out of the lungs?
- What keeps the alveoli from collapsing after the air is gone upon each breath? What neonatal abnormality falls into this category?
- What keeps the lungs from collapsing after the air is gone upon each breath?
- Getting back to the larynx, what is the structure and function of the vestibular and vocal folds?
- How do the vocal folds use expiring air to produce sound?
- How can air be modified in the larynx and beyond to produce the final sound of the voice?
- How is respiration controlled by the brain stem and higher brain centers?
- What are the chemical regulations of ventilation?
- What is the difference between quiet respiration and forced respiration?
- How is respiration measured?
- What are hyperoxia, hypoxia, hypercapnea, hypocapnea, eupnea, dyspnea, apnea, hypernea and the bends? Why does each occur?
- What are the causes, pathology, symptoms, and possible treatments for COPD, asthma, tuberculosis and lung cancer?
- Overview: Trace the path of blood through the body to include all vessels of the pulmonary and systemic circuits.
- Overview: Trace the flow of air from outside the body, into the alveoli and then back out of the body.
- Overview: Trace the flow of oxygen and carbon dioxide from the alveoli into the blood and then from the blood into the tissues and then back to the blood and alveoli.
- Overview: What are the properties of plasma and red blood cells that allow it to carry oxygen and carbon dioxide through the vessels?
- Overview: What factors affect volumes inspired, the amounts of carbon dioxide and oxygen externally respired, the transport of oxygen and carbon dioxide, and the amounts of carbon dioxide and oxygen internally expired?
- Overview: Review changes to the oxygen-saturation curves upon various factors like acidity, levels of carbon dioxide, levels of oxygen other chemicals.
- Overview: Identify any factors that may alter normal functioning of the lung to include infections anywhere along the respiratory tract, laryngitis, smoking use, obstruction (airways and circulation), edema, pleurisy, atelectasis, pneumothorax, asthma or allergic responses, respiratory distress, hyperoxia, hypoxia, carbon monoxide poisoning, hypocapnea, hypercapnia, hyperventilation, adjustments for high altitudes, COPD, emphysema, chronic bronchitis, tuberculosis and lung cancer.