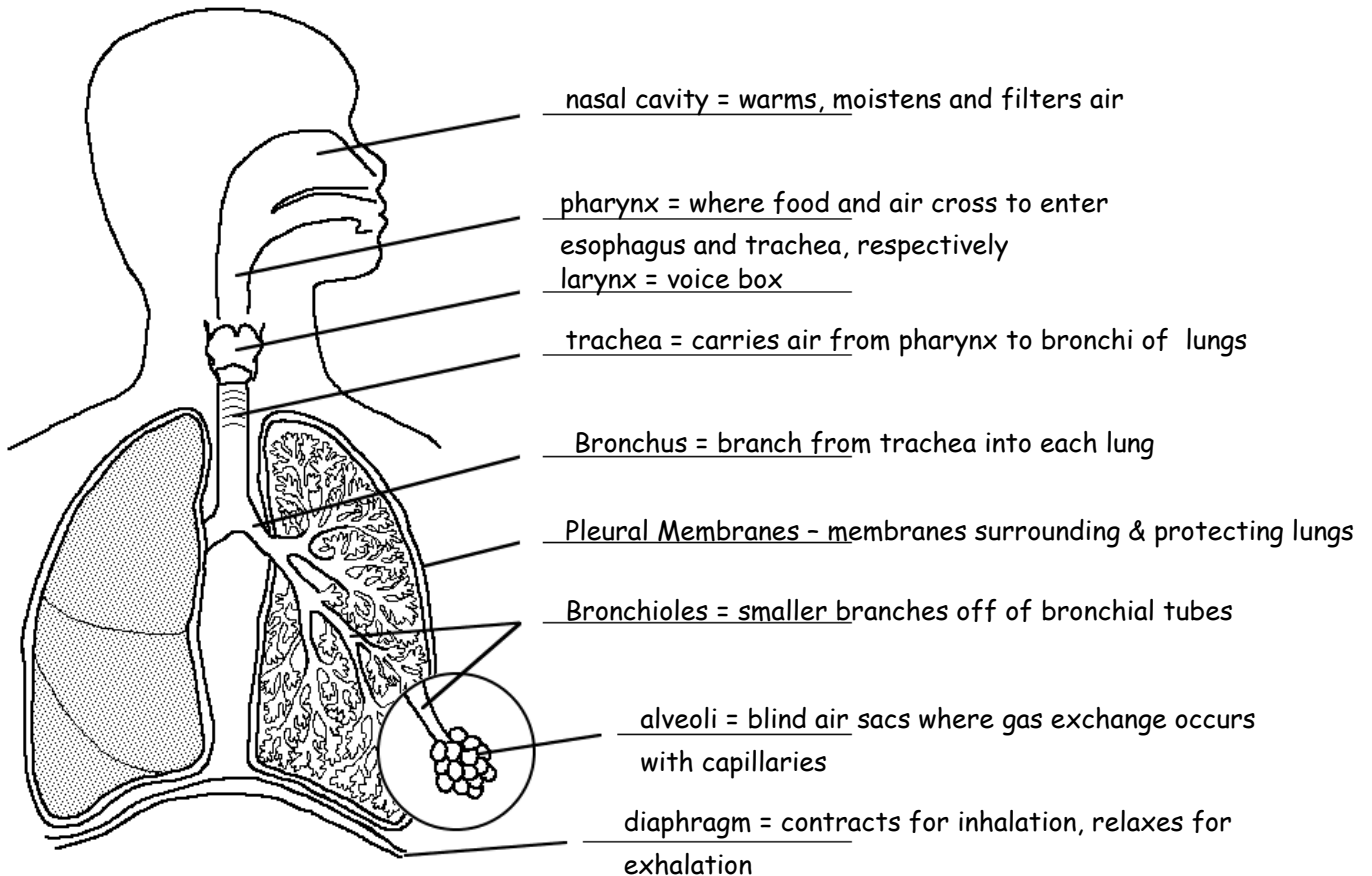


UNIT 5 ANSWER KEY

1. Label the respiratory system diagram below and provide a brief description of each structure's functions.

- | | | |
|---------------------------------|---|------------------------------------|
| <input type="radio"/> alveoli | <input type="radio"/> pleural membranes | <input type="radio"/> bronchus |
| <input type="radio"/> diaphragm | <input type="radio"/> pharynx | <input type="radio"/> bronchioles |
| <input type="radio"/> larynx | <input type="radio"/> trachea | <input type="radio"/> nasal cavity |



2. Use a flow chart with arrows to describe the path of air flow from the nose to the alveoli during inspiration.

nose/mouth → pharynx → glottis → trachea → bronchi → bronchioles → alveoli

3. Describe how debris and particulate in air is removed from the lungs.

= captured by mucus lining trachea and lungs, then mucus is propelled up to mouth by cilia, where it is then swallowed or spat out of the body

= sometime coughing is necessary to help move mucus upwards

4. Where is the respiratory center located?

= medulla oblongata of brain

5. What stimuli signal the respiratory center to initiate breathing?
= increased CO_2 and H^+ concentration stimulate increased breathing rate via the respiratory center of the medulla oblongata
6. What prevents the alveoli from over filling during forced inhalation such as when exercising?
= alveolar stretch receptors detect inflation of alveoli and send a signal via the Vagus nerve to the respiratory center of the medulla oblongata that stops the phrenic nerve and intercostal nerves from stimulating the diaphragm and intercostal muscles from contracting, resulting in relaxation of these muscles and exhalation
7. How does oxygen gas move from the alveoli to the blood across the walls of the alveoli and the capillary?
= diffusion
8. Oxygen is actually transported throughout the blood primarily as a complex within red blood cells, what is this complex called?
= oxyhemoglobin
9. In what form is carbon dioxide found in plasma? Carbon dioxide reacts with water in red blood cells to produce what compounds? What enzyme assists in this process? How does hemoglobin help with carbon dioxide transported by red blood cells?
= dissolved CO_2 in plasma
= when CO_2 reacts with H_2O in red blood cells it is converted to bicarbonate ions (HCO_3^-) and hydrogen ions (H^+)
= carbonic anhydrase
= reacts with CO_2 to form carbaminohemoglobin
10. Hemoglobin helps to buffer the blood by binding to excess hydrogen ions. What is the name of the complex that forms between hydrogen ions and hemoglobin?
= reduced hemoglobin
11. Give the full name for the following abbreviated compounds related to respiration and gas exchange.

O_2 = oxygen

Hb = hemoglobin

HHb = reduced hemoglobin

H^+ = hydrogen ion

HCO_3^- = bicarbonate ion

CO_2 = carbondioxide

HbO_2 = oxyhemoglobin

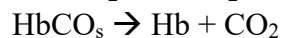
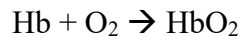
HbCO_2 = carbaminohemoglobin

H_2CO_3 = carbonic acid

H_2O = water

H_2O

12. List the set of equations that describe **external respiration in the alveoli of the lungs**. Remember the alveoli supply oxygen to the blood and receive carbon dioxide and water from the blood for removal.



13. List the set of equations that describe **internal respiration in the capillary bed** between the capillary and the tissue fluid. Remember the tissues receive oxygen from the blood and dump carbon dioxide and water into the blood

