3. RESPIRATORY ANATOMY

Station 1: Upper Respiratory Anatomy

References: ***Lab Manual, Exercise 31, p. 171-172. Complete Fig. 31.1, p. 172.***
Textbook, p. 754-757.
Workbook, p. 224, #2, q. 1-10, p. 225, #4, p. 227, #7.

Observe the upper respiratory model to answer these questions:

Q1A. Which letter identifies the structures that increase the surface area of the nasal cavity? Name them. Color them green on Fig. 13-1, p. 225.
Q1B. What type of epithelial cells cover the surface of the structures in Q1A?
Q2A. Which letters identify the two structures that separate the nasal cavity from the oral cavity? Name them. Color the more rigid structure purple and the other structure orange on Fig. 13-1, p. 225.
Q2B. An extension of the structure you colored orange blocks the opening into the nasal cavity during swallowing. Name this structure.
Q3A. Which letter identifies the part of the pharynx that is posterior to the glottis? Name it. Color it yellow on Fig. 13-1, p. 225.
Q3B. Which two letters identify the other parts of the pharynx? Name them. Color the superior one pink and the inferior one blue on Fig. 13-1, p. 225.
Q4A. Which letters on the model identify tonsils? To what body system do tonsils belong?
Q4B. Which letter on the model identifies an opening in the pharynx that is often responsible for middle ear infections? Name it.
Q5A. Which letter identifies the tonsils that are usually removed in a tonsillectomy? Name them.
Q5B. Which letter identifies the adenoids? What is their proper name? Color them red on Fig. 13-1, p 225.
Q6A. How many passages open out of the pharynx? Name them.

Observe the larynx model to answer the following questions:

Q6B. Which letter identifies the cartilage that protects the larynx and vocal cords? Name it.
Q7A. Which letter identifies the cartilage that supports the cartilage named in Q6B? Name it.
Q7B. Which letter identifies the structures that vibrate to produce sound? Name them. Color them red on Fig. 13-1, p. 225.
Q8A. Which letter identifies the cartilage that prevents food and water from entering the respiratory passages when swallowing? Name it. Color it pink on Fig. 13-1, p. 225.
Q8B. What is the opening to the lower respiratory tract called?

Station 2: LOWER RESPIRATORY PASSAGES

Refer to your ***Lab Manual, p. 172-173, and complete Fig. 31.2;***
Workbook, p. 223, #1, p. 224, #2 (Q11-16 only), & p. 226, #5;
Hole Textbook, pp. 757-764.

Observe the bronchial tree model to answer the following questions:

Q9A. Which letter identifies a primary bronchus? How many primary bronchi are there?
Q9B. Which letter identifies the left secondary bronchi? How many of them are there?
Q10A. How many secondary bronchi are there on the right side? Why?
Q10B. Which letter identifies a tertiary bronchus? Do tertiary bronchi contain cartilage?

Station 3: LUNG CAVITIES AND MEMBRANES

Refer to your ***Lab Manual, p. 172-173;***
Hole Textbook, pp. 764-772;
Workbook, p. 229, #9, p. 230, #10 & #11, p. 231, #12, #13, & #14.

Observe the model of the lungs to answer the following questions:

Q11A. Name the membrane that would be found lining the pleural cavity. Color it purple on p. 228, Fig. 13-3.
Q11B. Name the membrane that would be found here. Color it yellow on p. 228, Fig. 13-3.
Q12A. Identify this muscle. Color it orange on p. 228, Fig. 13-3.
Q12B. When the muscle in Q12A relaxes, does it rise into the thoracic cavity or lower toward the abdominopelvic cavity? Write your answer on your answer sheet and draw a blue arrow below the muscle on Fig. 13-3 indicating the direction that it moves.
Q13A. When the muscle in Q12A contracts, what happens to the pressure within the pleural cavity?
Q13B. What is the area of the thoracic cavity containing the trachea called? Color the C-rings on the trachea on Fig. 13-3, p 228 pink.

Station 4: ALVEOLAR MEMBRANE AND GAS TRANSPORT

Refer to your Hole Textbook, p. 778-785.
Workbook, p. 229, #9, p. 233, #17, #18, & #19.

Q14A. Which letter identifies a respiratory tube whose lining is made up of cuboidal epithelium? Name it. Color this tube yellow on p. 229, Fig. 13-4A.
Q14B. Which letter identifies a lung structure where gas exchange actually takes place? Name it. Color at least one of these pink on p. 229, Fig. 13-4A.
Q15A. What kind of tissue are the structures in Q14B made of? Why?
Q15B. Besides the wall of the structure in Q14B, part of the respiratory membrane is also contributed by another structure. Name it. What letter identifies it on the model?
Q16A. Cells in the structures in Q14B secrete a substance that makes inflation easy. Name this substance. How does it work?
Q16B. What molecule binds oxygen and is primarily responsible for transporting it in the blood? Where is this molecule found?
Q17A. Since only a small amount of carbon dioxide can be dissolved in plasma or bound to the molecule in Q16B, in what form is most of the carbon dioxide carried in blood transported? What enzyme makes this molecule?
Q17B. By what process of movement through membranes that we studied back in Chapter 3 does oxygen and carbon dioxide cross the respiratory membrane? Draw a purple arrow representing oxygen showing the direction of movement on Fig. 14-4, p. 229 and draw a pink arrow representing carbon dioxide showing the direction of its movement.
Q18A. Define pulmonary ventilation.

Station 5: RESPIRATORY HISTOLOGY

Refer to the microviewer slides, Smoking and Health" and your text, p. 756, to answer these questions:

Q18B. Name the specialized structure on cells of the upper and lower respiratory tracts that clean the passages by moving mucus and trapped particulate matter to the pharynx.
Q19A. Name the cells that secrete mucus.
Q19B. What is the function of the mucus?
Q20A. What happens when there is too much mucus?
Q20B. Name two major changes in the respiratory epithelium caused by smoking.

Q21: **Clinical Application Thought Question:** (Answer at the bottom of your lab report.)
A patient with emphysema has great difficulty forcing air out of their lungs. Why?

Turn in p. 225, 228 and 229 from your workbook with your lab report.