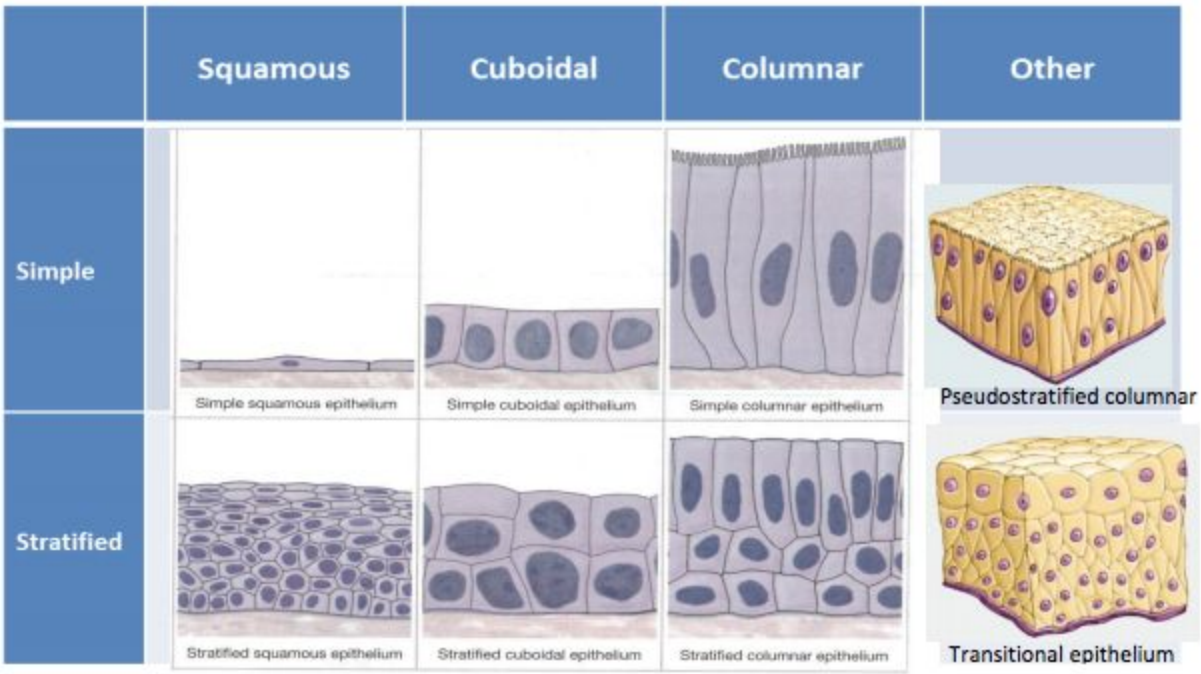
Name:_____

Period:_____ Date:_____

Modeling the Structures of Epithelial Tissue

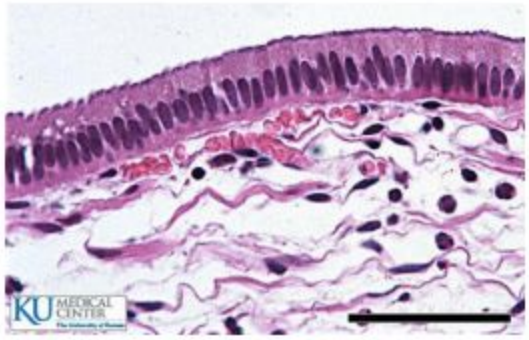
Please answer the following questions in *complete sentences*. As you work through the questions, you will be using your posterboard/play-do to create models of the different types of cells and tissues that comprise epithelial tissues.

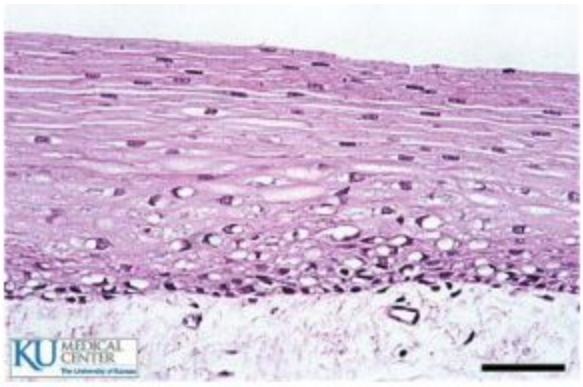
MODEL #1: Structure of Epithelial Tissues



1. Describe the morphology (shape) of the three cell types that make up epithelial tissues.
    a. On your poster board, use your play-do to make a model of each of the three cell types, taking care to show the differing shapes of the cell and their nuclei. You only need to make one single cell for each model.
    b. Label each cell type (i.e. squamous cell), and any associated structures (nuclei, cytoplasm, cell membrane, cilia).
2. Describe the difference between simple and stratified epithelial tissues.
    a. On your poster board, use your play-do to make a model of each of the following tissues:
        i. Simple squamous
        ii. Simple cuboidal
        iii. Simple columnar (ciliated)
        iv. Stratified squamous
    b. On your poster board, label each tissue model with its name.

    c. On your poster board, label the apical (top) and basal (bottom) layer of each tissue model.
3. What tissue type is always found beneath the basal (bottom) layer of epithelial tissues? What function does this supporting tissue provide?
4. Examine your answers to questions 1 & 2. What two characteristics are used to name and classify epithelial tissues?
5. Examining the picture above (Model 1), what two epithelial tissues do not conform to this naming/classification system?
    a. Describe the structure of these two nonconforming tissues.
6. Again, reference the picture above (Model 1). Compare simple columnar epithelial tissue to pseudostratified columnar epithelial tissue.
    a. How are these two tissues similar?
    b. How are these two tissues different?
7. Stratified epithelial tissue may have different cell shapes from the bottom (basal) layer to the top (apical) layer.Which layer determines the shape classification (and naming) of the tissue? Provide evidence to support your answer.
8. Using the photos below...
    a. Indicate and label the apical surface on each epithelial tissue photomicrograph.
    b. Indicate and label the basal surface on each epithelial tissue photomicrograph.
    c. Draw a bracket to indicate the location of the epithelial tissue (hint - remember that all epithelial tissues rest on a support layer of connective tissue!).
    d. Name the specific epithelial tissue type.

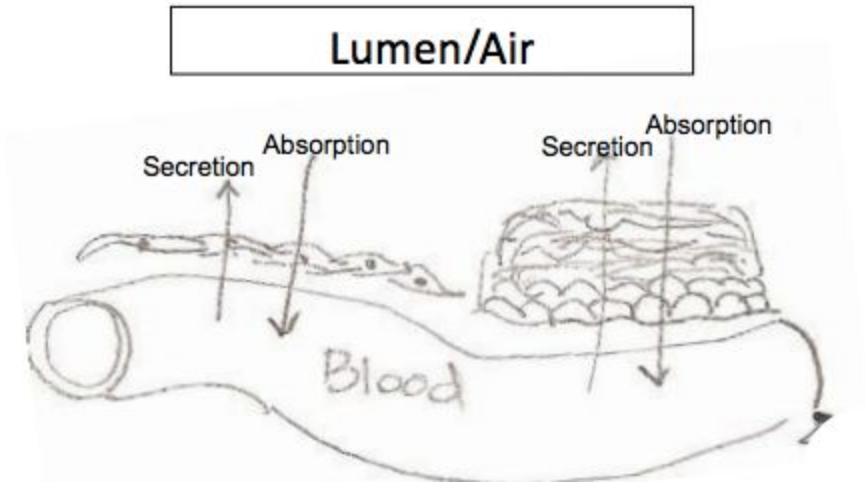
a. 

b. 

Tissue = _____

Tissue = _____

MODEL #2: Function of Epithelial Tissue



9. Epithelial tissue covers surfaces and provides a barrier between body fluids/air and underlying tissues. Organs need to transport fluids between blood vessels and lumen, which requires the chemicals to pass through the epithelial tissue.
    a. Label each of the epithelial tissues drawn above (left & right) as either simple or stratified.
    b. For a molecule to be absorbed, which tissue route will take longer? Explain why.
10. The structure of the epithelial tissue is directly related to its covering function. Use the drawing above (Model #2) to determine if the listed epithelial tissue functions below are best fulfilled by simple or stratified tissue.
    a. Protection: Epithelia protect exposed surfaces from abrasion, dehydration, and other damage caused by biological and chemical agents
    b. Diffusion: exchange of chemicals by passive transport
    c. Absorption: movement of chemicals from blood vessel into a vesicle for transport
    d. Secretion: cells produce a specific chemical that is released into the blood stream
    e. Filtration: exchange allows small molecules to pass through epithelial, but prevents passage of large molecules
    f. Stretching = tissue distends/widens to accommodate increased fluid volume
    g. Propulsion = cilia move chemicals/fluids across epithelial tissue surface, moving the chemicals to another location
11. Complete the table below detailing locations and functions of various epithelial tissues. Use your notes/book for help!

Epithelial Tissue	Function	Location
Simple Squamous		
Simple Cuboidal		

Simple Columnar		
Stratified Squamous		
Transitional Epithelia		
Pseudostratified Ciliated Columnar		

12. The majority of dust is composed of human skin cells. What does this indicate about the rate of mitosis for epithelial tissue?
13. Epithelial cancers are the most common types of cancer. What makes skin so susceptible to uncontrolled cellular growth?