

Name: \_\_\_\_\_

## ANATOMY & PHYSIOLOGY I

### System Assignment

#### Tissues

The purpose of this assignment is to ensure that you are working diligently to keep up with the material and to give you practice both researching answers and answering questions specifically and succinctly.

To receive credit for this assignment, your answers must be in your own words, and:

- well-written, with terms correctly spelled.**
- NOT** copied from any course handouts;
- NOT** be copied from your or any other textbook (with the exception of definitions);
- NOT** be identical to another student's answers; and
- NOT** be dictated by academic support services in the ARC.

The due date for this assignment will be announced in class.

Due date: \_\_\_\_\_

# Points: 50

The purpose of this System Assignment is to build a **tissue identification key** (also called a dichotomous key) that will be used to identify different tissue types under the microscope. Keys such as these are common tools used by biologists to identify and classify organisms.

Follow the instructions below to construct the first draft of your key. Bring your first draft to lab next week. I will have slides available of all of the featured tissues. Use these slides to “test” your key (*i.e.*, see if it can really identify the tissue you are looking at). You may want to make adjustments to your key; that’s the point of looking at the slides.

Once you have a good working document, you will be assigned an “unknown” slide. This slide contains a section of an organ and therefore has many different tissues on it. You must choose three tissues on that slide and identify them using your key. The goal of this project is for you to hone your problem-solving skills. You will not fail this assignment if you misidentify your tissues. Your thought process is more important.

### Part 1. Constructing your first draft.

1. You have each been given a sheet of paper with 15 flashcard images of tissues. These are the only tissues that we will be covering in this assignment.

During the lab session, you and your group only need to work with one set of flashcards. You can then each take home your own for the rest of the assignment.

2. Using the scissors provided, cut out your flashcards along the dashed lines.

3. Use either your textbook or the *Brief Atlas of the Human Body (BAHB)* to label each of the little flashcards.

4. Separate out the six types of epithelial tissues. What are they?

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

Put the rest of the flashcards away for the time being.

5. Epithelial tissue can be identified by the presence of a free edge. On each of your flashcards, draw an arrow pointing to the free edge you see. (The free edge is the surface exposed to a cavity or to air.)

6. Is the free edge always on the **outside** surface of the tissue?                      **YES**                      **NO**

7. Epithelial tissue is classified by the shapes of the cells and the numbers of cells in the layers.

a. If you looked at a cell and it appeared very flat, what term would you use to describe it? \_\_\_\_\_

b. If the cell appeared tall and skinny, how would you describe it? \_\_\_\_\_

c. If the cell’s proportions were roughly the same in all directions, what term would you use to describe it? \_\_\_\_\_

8. Separate your epithelial cell flashcards into three piles, one pile for each of the terms you described above. Make sure that you can see the differences in the cell shapes before you move on.

9. Place the two flashcards that contain squamous epithelium side-by-side. What significant difference do you see in the tissue structure between these two pictures?

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10. Try this comparison between the two pictures that show cuboidal epithelium. Do you see the same difference?                      **YES**                      **NO**

You should now have enough information to construct the epithelial tissue portion of your key. This key is like a flowchart; when it is complete, it should resemble an upside-down tree. Each branch of the tree is created by asking a Yes/No question.

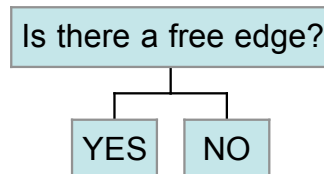
Some rules about designing your identification key:

- a. Every question should be answered with a **yes** or a **no**.
- b. Only ask questions that can be answered by looking under a microscope.  
Good question: Do I see tissue that resembles cut tree trunks?  
Bad question: Do the cells express the gene for keratin?
- c. Questions need not sound "scientific" (see the good question above). The purpose of the key is to help **YOU** identify the tissues. If the question makes sense to you (and isn't factually incorrect), it's fine.
- d. When your key is complete, each of the 15 tissues should be at the tip of its own branch, and all 15 must be on the same tree..

11. Begin to construct your key. Start with the first question

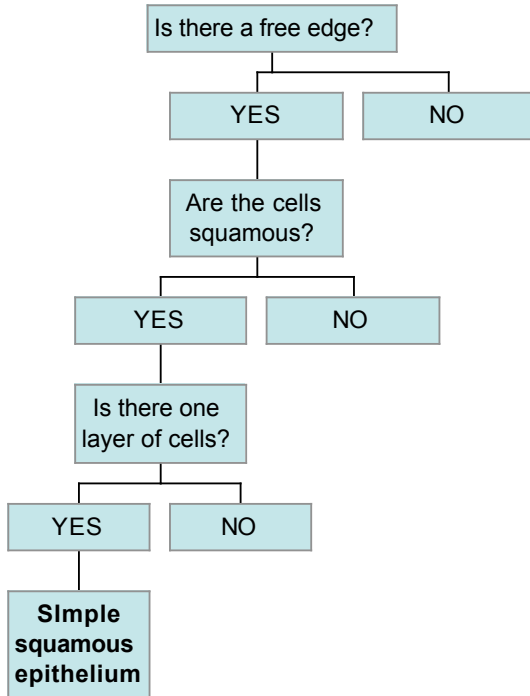
Is there a free edge?

12. Draw a line for Yes and a line for No



For now, only concern yourself with the **Yes** side of the key.

13. Enter your first question for the Yes group. Continue constructing the key until only one tissue type is at the end of the question. Write the name of the tissue type when it is alone at the end of a question. The first part of the key has been partially completed (next page) to help you get started. Look at it carefully before proceeding.



- Looking at this partial key, off what branches would you put:
- simple cuboidal epithelium?
  - pseudostratified columnar epithelium?
  - stratified squamous epithelium?
  - skeletal muscle?

14. Complete the rest of the key above for the six epithelial tissues, following the model above. Add more questions until each of the six epithelial tissues is at the tip of its own branch. Use your flashcards (if they help) when trying to come up with questions. (Note: you will be adding onto the “head-start” I’ve provided for you above.)

15. When you are finished, put away the epithelial tissue flashcards and bring back the connective tissues and muscles.

16. Look at the remaining tissues. These are all in the **No** category from the original question about the free edge. Of these tissues, five have a great deal of extracellular matrix, while the other four have little or none. Assign them to the correct location in the following table:

Tissues with lots of extracellular matrix	Tissues with little or no extracellular matrix
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	

17. Your answers in the table above should give you an idea for your next question following the **No** of the free edge question. Continue the key that you started until each of the tissues is listed in its own separate group. (Note: Feel free to switch to a clean sheet of paper, if you haven’t already.)

**Note:** It is important to understand that while all extracellular matrix has fibers, only some fibers are visible with the light microscope. Questions about fibers should refer to visible fibers. (Example: Both bone and hyaline cartilage contain collagen fibers, but they are too tiny to be seen under the microscope, so they shouldn’t form the basis for one of your questions.)

18. Bring your first draft of your key to lab next week. It is important that you do this; otherwise, you'll have to work on it during lab and you'll fall behind.

## Part 2. Testing your key.

Today in lab, slides will be available of the various tissues for which you are responsible. You should take this time to ensure that your key can correctly identify them. If you feel that changes need to be made to your key, this is your time to make them (that's why we call it a first draft). During the course of the lab, I will come around and offer comments and suggestions on your key. I can't comment on keys that do not exist; that's why you need to have something in hand.

## Part 3. Identifying unknown tissues.

You will be given a number that corresponds to a slide in that is stored in a pink slide box in the back room. With the aid of your key, you need to identify three tissues on that slide (there will be more than three present; pick the three easiest for you).

We are not the only section of this course that uses these slides. Therefore, I ask:

1. that you do **NOT** remove your slide from the lab or back room;
2. that you return your slide to the pink box when you're finished looking at it;
3. that you tell me immediately if your slide is missing/broken, and I will replace it.

### When this assignment is due, submit the following for grading:

1. Your answers to the questions in **Part 1**.

2. The three tissue identification sheets attached.

Each sheet should contain:

Your slide number

The tissue type identified

A general (and brief) description of the tissue

One or two examples of where this tissue is located in the body (see textbook/*BAHB*)

A flowchart describing the path you followed through your key to reach your conclusion. The first question in each flowchart should be "Is there a free edge?"

3. The grading sheet at the end of this packet.

4. A copy of your identification key on 8½ x 11" paper. Multiple sheets and different colors are fine; just no poster boards, please!

→ I do **NOT** want your little flashcards, but they would make an excellent addition to your Histology Notebook.

**Tissue Identification Sheet 1**

**Unknown Tissue Slide #** \_\_\_\_\_

Tissue Type 1 \_\_\_\_\_

Tissue Description:

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Location:

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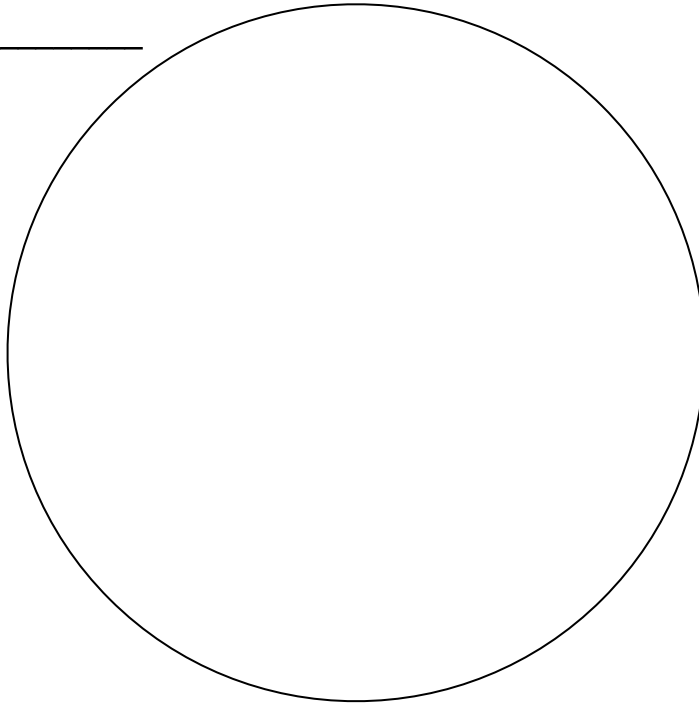
Pathway to this decision (flowchart):

**Drawing of Unknown Tissue #1**



Unknown Tissue #2: \_\_\_\_\_

Total magnification: \_\_\_\_\_



Note: Once this assignment is returned with a grade, this drawing should be cut out and taped into your Histology Notebook. The drawing will not be graded as part of the System Assignment; it will be counted towards the Histology Notebook project.

Never, ever, ever copy drawings out of books, handouts or websites. All drawings must be from your own observations!

**Tissue Identification Sheet 2**

**Unknown Tissue Slide #** \_\_\_\_\_

Tissue Type 2 \_\_\_\_\_

Tissue Description:

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Location:

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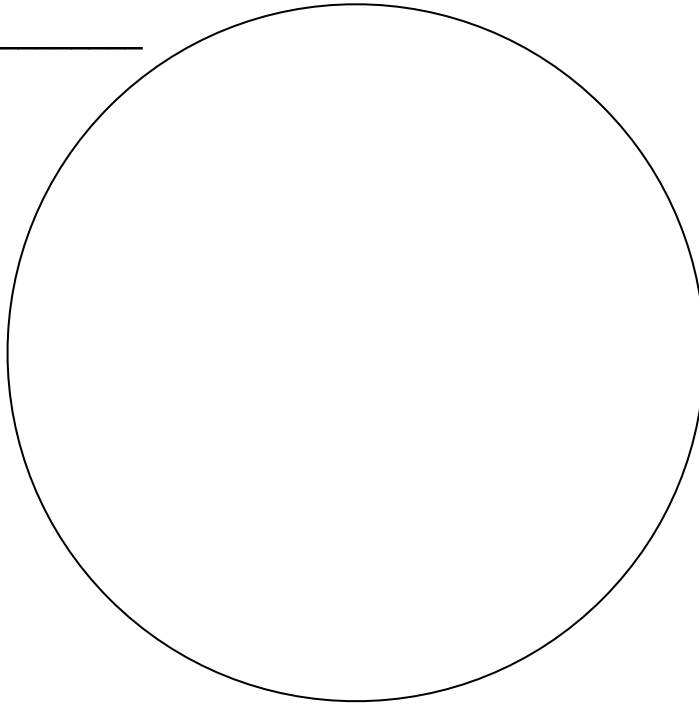
Pathway to this decision (flowchart):

**Drawing of Unknown Tissue #2**



Unknown Tissue #2: \_\_\_\_\_

Total magnification: \_\_\_\_\_



Note: Once this assignment is returned with a grade, this drawing should be cut out and taped into your Histology Notebook. The drawing will not be graded as part of the System Assignment; it will be counted towards the Histology Notebook project.

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**Tissue Identification Sheet 3**

**Unknown Tissue Slide #** \_\_\_\_\_

Tissue Type 3 \_\_\_\_\_

Tissue Description:

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Location:

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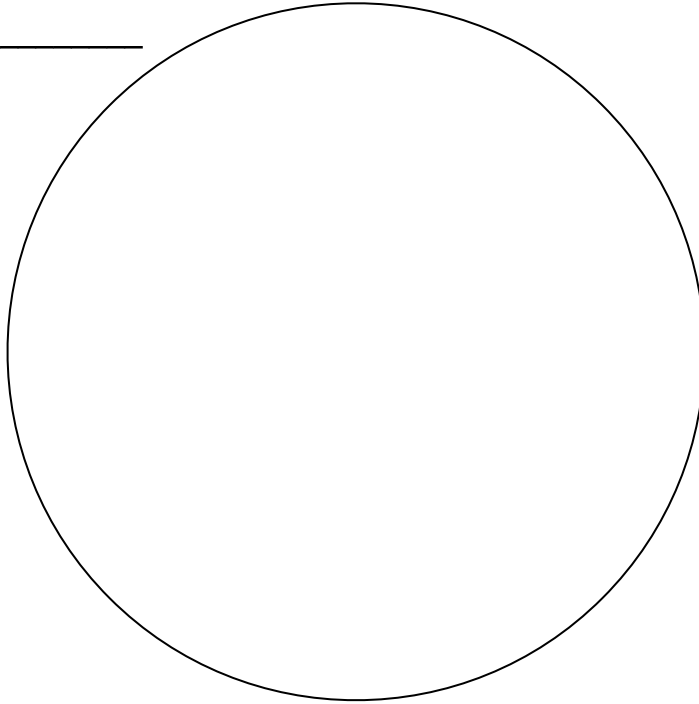
Pathway to this decision (flowchart):

**Drawing of Unknown Tissue #3**



Unknown Tissue #3: \_\_\_\_\_

Total magnification: \_\_\_\_\_



Note: Once this assignment is returned with a grade, this drawing should be cut out and taped into your Histology Notebook. The drawing will not be graded as part of the System Assignment; it will be counted towards the Histology Notebook project.

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## Grading Sheet

\_\_\_\_\_ **Identification Key** (20 points)

Tissues are sorted in a logical and usable manner (15)

The key arrangement is orderly and neat (5)

\_\_\_\_\_ **Tissue Identification Sheets** (30 points)

**Tissue Unknown 1**

Tissue identification is correct (5)

Tissue description and location included (2)

Logical path through attached key is used (3)

**Tissue Unknown 2**

Tissue identification is correct (5)

Tissue description and location included (2)

Logical path through attached key is used (3)

**Tissue Unknown 3**

Tissue identification is correct (5)

Tissue description and location included (2)

Logical path through attached key is used (3)

\_\_\_\_\_ **Total Grade**