

# 6

## REVIEW SHEET EXERCISE

NAME \_\_\_\_\_

LAB TIME/DATE \_\_\_\_\_

# Classification of Tissues

## Tissue Structure and Function—General Review

1. List the following in order from least complex to most complex: organ, cell, tissue, and organ system. cell, tissue, organ, organ system

2. Define *histology*. Histology is the study of the microscopic structures of cells and tissues of plants and animals.

3. Use the key choices to identify the major tissue types described below.

Key: a. connective tissue      b. epithelium      c. muscle      d. nervous tissue

b; epithelium 1. lines body cavities and covers the body's external surface

c; muscle 2. pumps blood, flushes urine out of the body, allows one to swing a bat

b; epithelium 3. forms endocrine and exocrine glands

a; connective tissue 4. anchors, packages, and supports body organs

b; epithelium 5. classified based on the shape and arrangement of the cells

a; connective tissue 6. derived from mesenchyme

c; muscle 7. major function is to contract

d; nervous tissue 8. transmits electrical signals

a; connective tissue 9. consists of cells within an extracellular matrix

a; connective tissue 10. most widespread tissue in the body

d; nervous tissue 11. forms nerves and the brain

## Epithelial Tissue

4. Describe five general characteristics of epithelial tissue. (1) The cells fit closely together, forming sheetlike membranes.

(2) Little intercellular material between the cells. (3) Avascular. (4) Membrane has a free edge. (5) Generally has a high regenerative capacity.

5. For each function listed, name one type of epithelium and an organ that provides for that function.

Function 1: Protection stratified squamous epithelium—skin

Function 2: Diffusion simple squamous epithelium—lungs (lining of the alveoli)

Function 3: Secretion simple columnar epithelium—glandular cells

Function 4: Filtration simple cuboidal epithelium—kidney tubule cells

Function 5: Absorption simple cuboidal epithelium—cells lining the digestive tract

6. What structural feature do epithelia that provide for protection have in common? They are all stratified.

7. Describe the following cell-surface modifications using the table below.

Cell-surface modification	Type(s) of epithelia with the modification	Function (include a specific organ)
Cilia	pseudostratified columnar epithelium	sweeps mucus and debris up and out of the trachea
Goblet cells	pseudostratified columnar epithelium simple columnar epithelium	To produce mucins to cover the lining of mucous membranes such as the digestive tract.
Microvilli	simple columnar epithelium	Increase surface area for greater absorption in areas such as the digestive tract.

8. Transitional epithelium is actually stratified squamous epithelium with special characteristics.

How does it differ structurally from other stratified squamous epithelia? When stretched, its top layers are squamous, but when not stretched, its top layers are pillow-shaped.

How does the structural difference support its function? The surface cells have the ability to slide over one another,

increasing the internal volume of the organ (e.g., bladder) as it fills and maintaining an intact lining whether stretched or contracted.

9. How do the endocrine and exocrine glands differ in structure and function? Endocrine glands are ductless glands. They produce hormones, which are liberated into the extracellular fluid to enter the blood. Exocrine glands maintain their ducts and manufacture secretions of various types (perspiration, oil, digestive enzymes, etc.), which are ducted to the body (or membrane) surface.

## Connective Tissue

10. What are three general characteristics of connective tissues? Common origin of connective tissue from mesenchyme, varied degrees of vascularity, and a large amount of extracellular matrix that varies with tissue type.
11. What functions are performed by connective tissue? Protection, support, and the binding together of other body tissues.  
Transportation of substances within the body is another function.
12. How are the functions of connective tissue reflected in its structure? There is a wide variety in the structures of connective tissue. This is reflected in the wide variety of functions they perform. Also, the large amount of nonliving matrix seen  
provides the strength needed to protect the body and carry out the normal functions of the body.
13. Using the key, choose the best response to identify the connective tissues described below.
- |                              |   |   |
|------------------------------|---|---|
| <u>d; dense regular</u>      | 1. attaches bones to bones and muscles to bones                                   | Key: a. adipose connective tissue<br>b. areolar connective tissue<br>c. dense irregular connective tissue<br>d. dense regular connective tissue<br>e. elastic cartilage<br>f. elastic connective tissue<br>g. fibrocartilage<br>h. hyaline cartilage<br>i. osseous tissue |
| <u>a; adipose</u>            | 2. insulates against heat loss  |   |
| <u>c; dense irregular</u>    | 3. forms the fibrous joint capsule  |   |
| <u>g; fibrocartilage</u>     | 4. makes up the intervertebral discs  |   |
| <u>b; areolar</u>            | 5. composes basement membranes; a soft packaging tissue with a jellylike matrix   |   |
| <u>h; hyaline cartilage</u>  | 6. forms the larynx, the costal cartilages of the ribs and the embryonic skeleton |   |
| <u>e; elastic cartilage</u>  | 7. provides a flexible framework for the external ear                             |   |
| <u>i; osseous tissue</u>     | 8. provides levers for muscles to act on  |   |
| <u>f; elastic connective</u> | 9. forms the walls of large arteries  |   |

## Nervous Tissue

14. What two physiological characteristics are highly developed in neurons? irritability and conductivity
15. In what ways are neurons similar to other cells? They contain a nucleus and the usual organelles.  
How are they structurally different? Their cytoplasm is drawn out into long processes.
16. Describe how the unique structure of a neuron relates to its function in the body. Neurons conduct impulses over relatively long distances in the body. This is facilitated by their long cytoplasmic extensions.

## Muscle Tissue

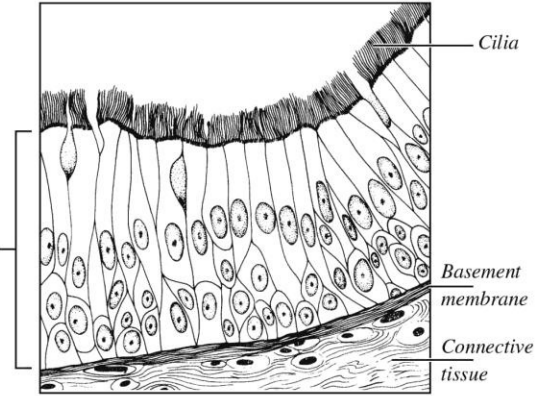
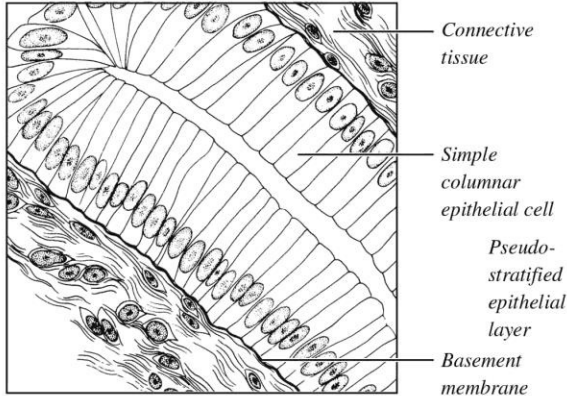
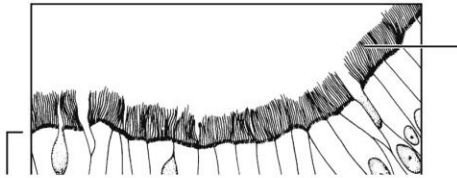
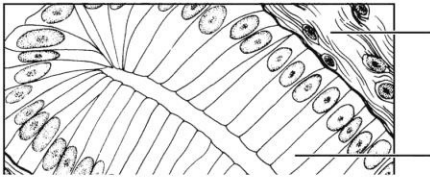
17. The terms and phrases in the key relate to the muscle tissues. For each of the three muscle tissues, select the terms or phrases that characterize it, and write the corresponding letter of each term on the answer line.

- Key:*
- |                         |                |                           |
|-------------------------|----------------|---------------------------|
| a. striated             | e. voluntary   | i. attached to bones      |
| b. branching cells      | f. involuntary | j. intercalated discs     |
| c. spindle-shaped cells | g. one nucleus | k. in wall of bladder and |
| d. cylindrical cells    | h. many nuclei | l. forms heart walls      |

Skeletal muscle:     a, d, e, h, i     Cardiac muscle:     a, b, f, g, j, l     Smooth muscle:     c, f, g, k

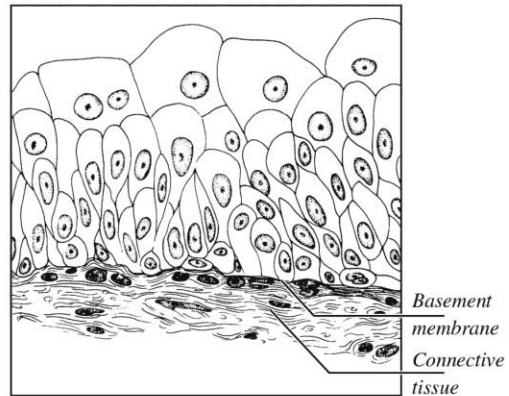
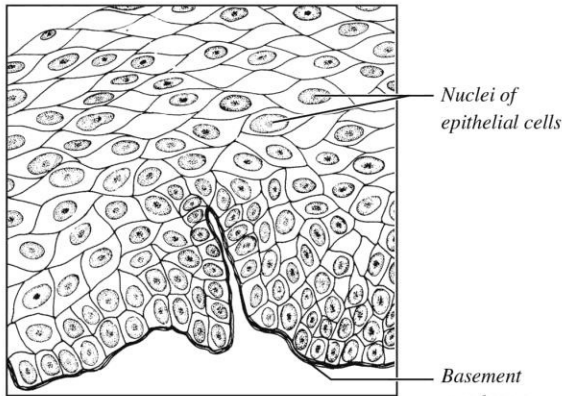
# For Review

22. Label the tissue types illustrated here and on the next page, and identify all structures provided with leaders.



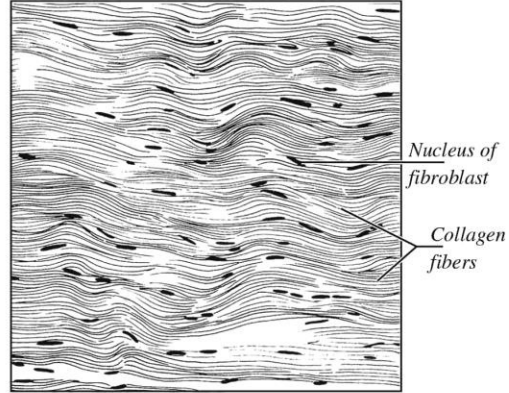
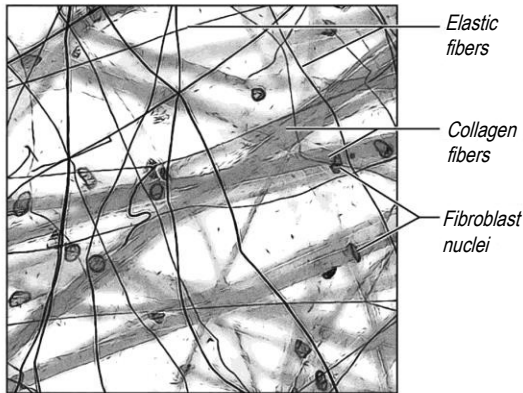
(a) Simple columnar epithelial

(b) Pseudostratified ciliated columnar epithelial



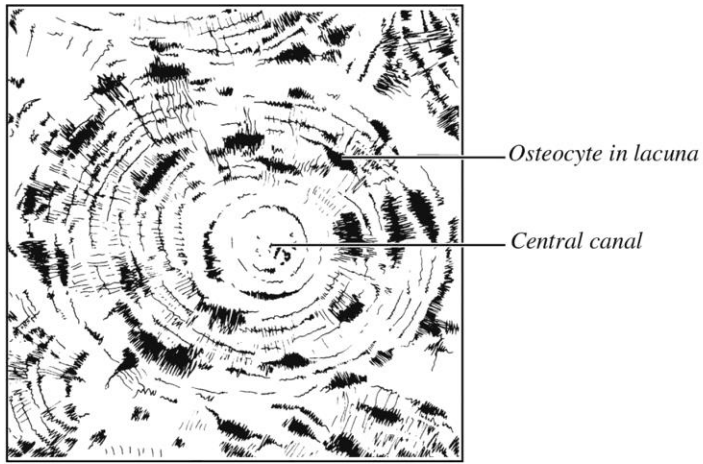
(c) Stratified squamous epithelial

(d) Transitional epithelial

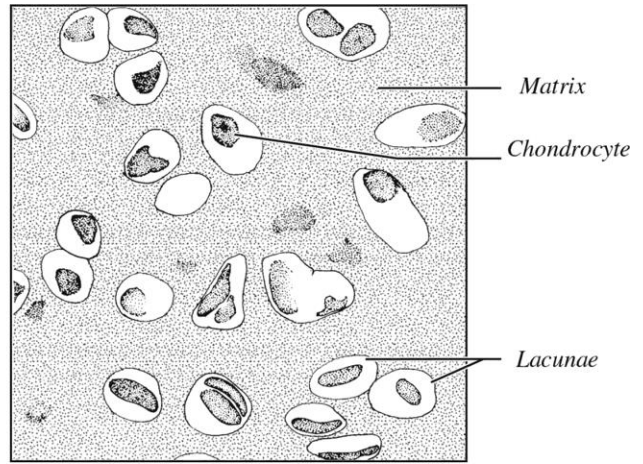


(e) Areolar connective tissue

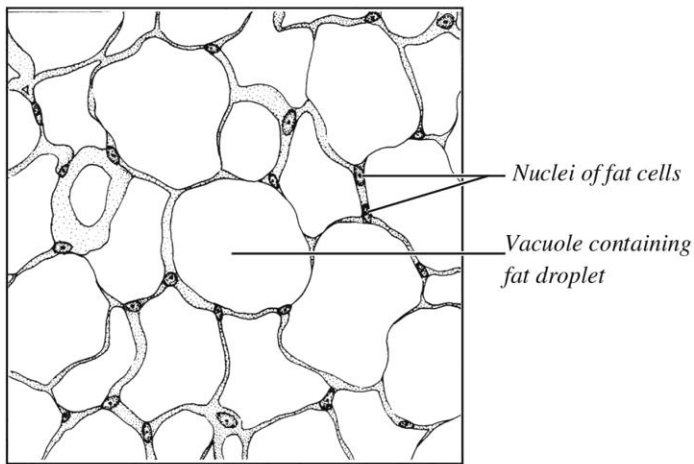
(f) Dense regular connective tissue



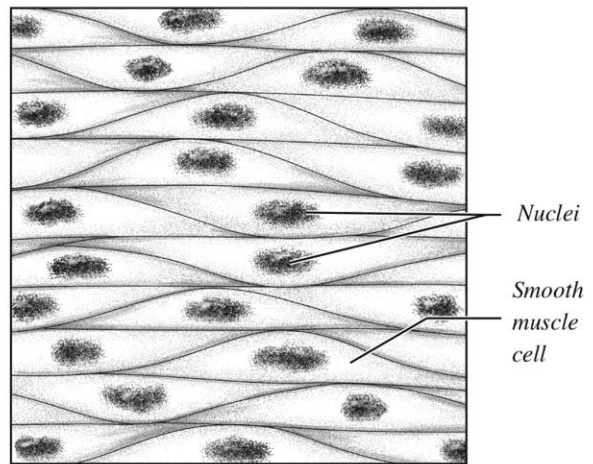
(g) Bone (osseous tissue)



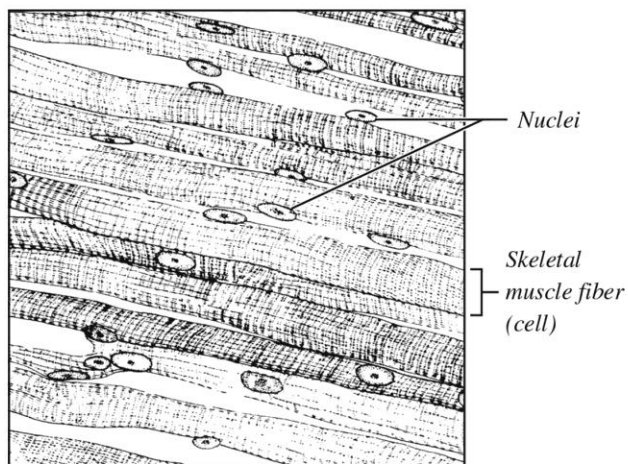
(h) Hyaline cartilage



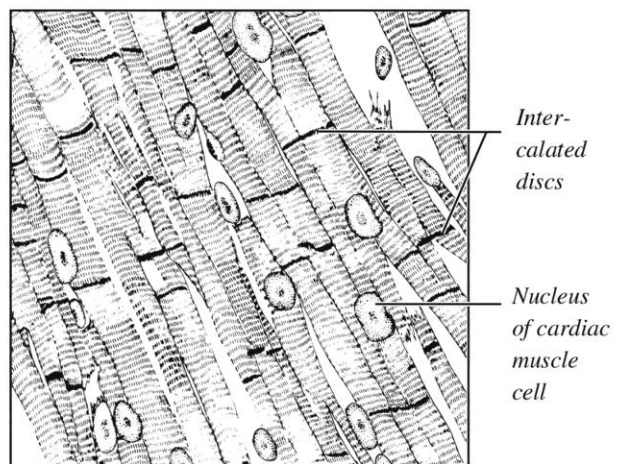
(i) Adipose tissue



(j) Smooth muscle tissue



(k) Skeletal muscle tissue



(l) Cardiac muscle tissue