

**BIO 211:**  
**ANATOMY & PHYSIOLOGY I**

1



**Module 1 of 5**

**BONE LABS:**

- STRUCTURE -
- CLASSIFICATION -
- SKELETON ORGANIZATION -

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## Bone Classification by Shape

**STRUCTURE & CLASSIFICATION**

**(a) LONG**

**(b) SHORT**

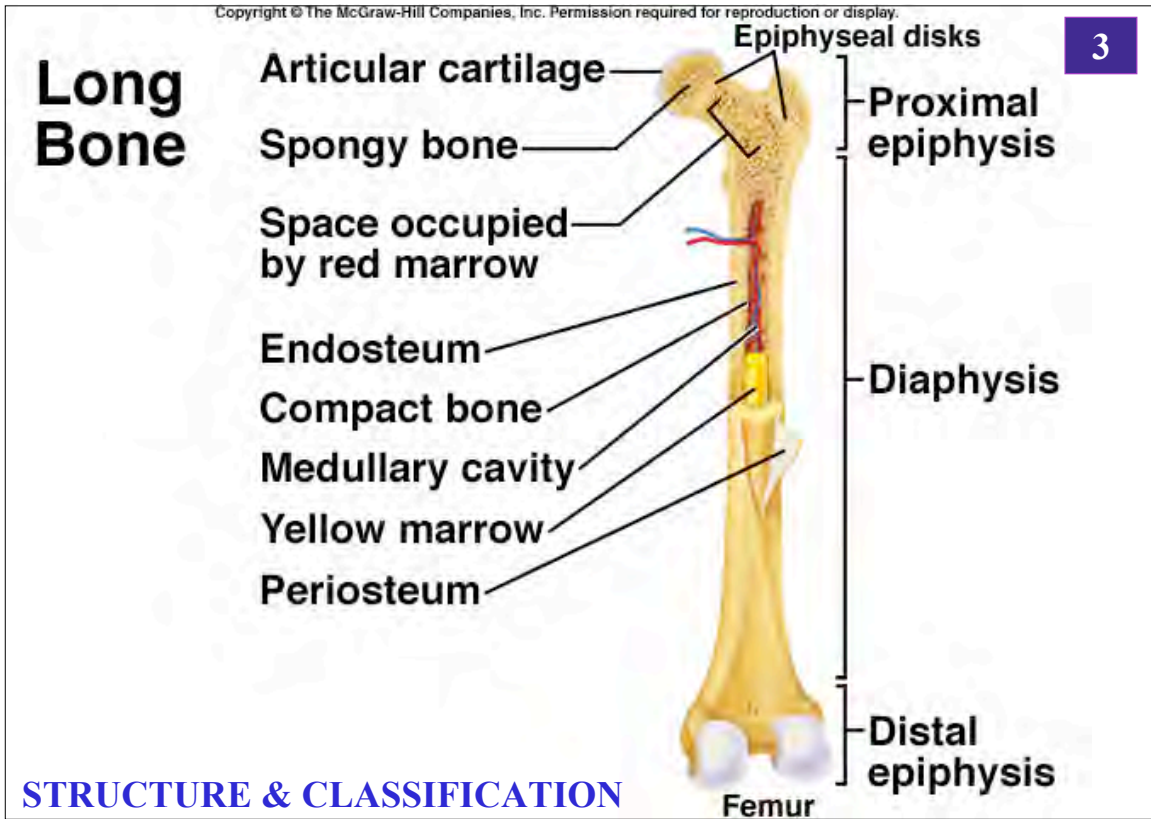
**FLAT (c)**

**IRREGULAR (d)**

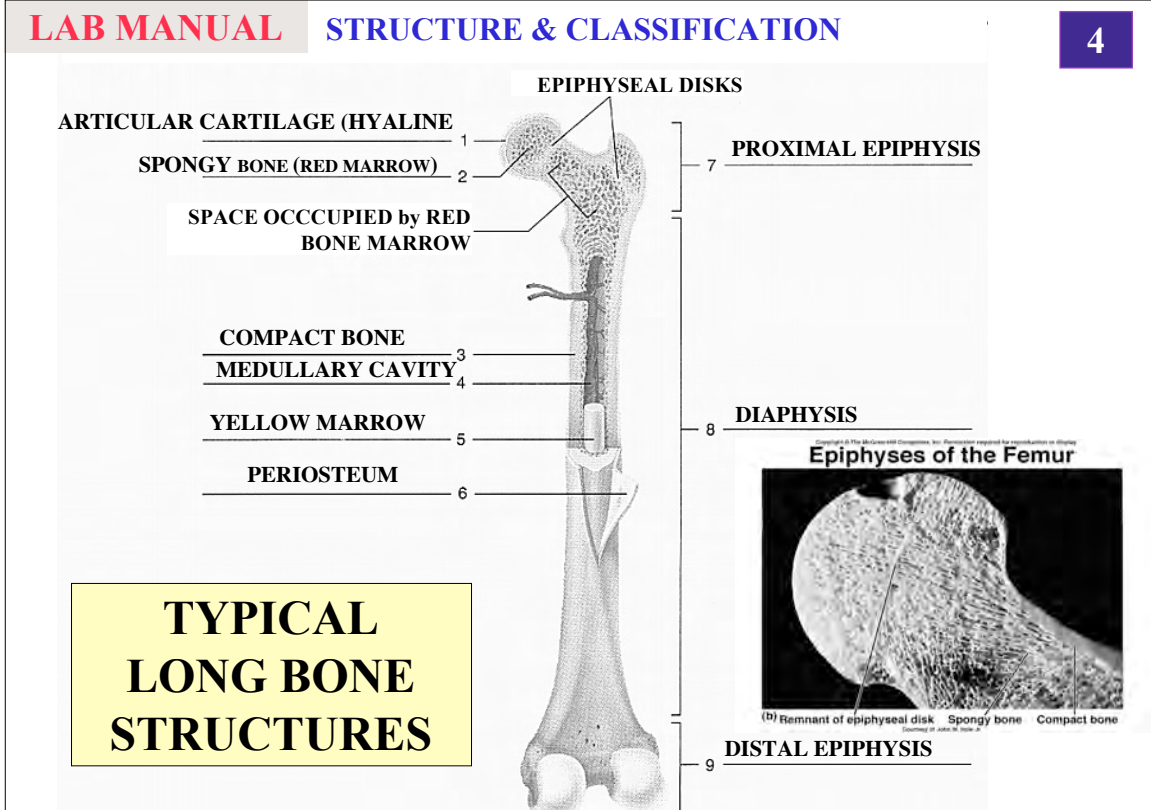
**SESAMOID (e) (ROUND)**

- FEMUR (thigh)
- TARSAL (foot)
- PARIETAL (skull)
- VERTEBRA (backbone)
- PATELLA (knee)

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**LAB MANUAL**    **STRUCTURE & CLASSIFICATION**



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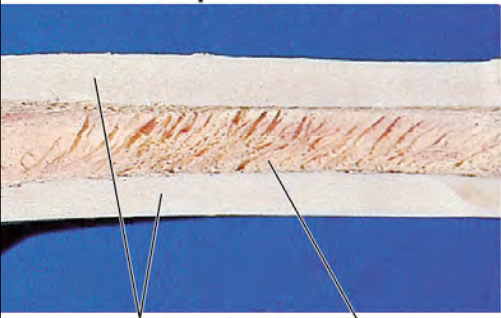
### Skull Bone



(c) Spongy bone Compact bone  
Courtesy of John W. Howe, Jr.

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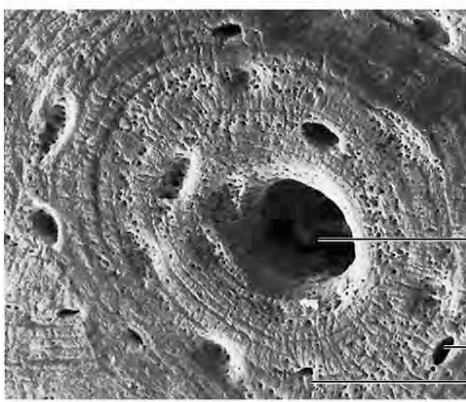
### Compact Bone



Compact bone Yellow marrow in medullary cavity  
Copyright Lester Bergman & Associates

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### Osteon in Compact Bone



Osteonic canal  
(HAVERSIAN)  
Lacuna  
Canaliculus

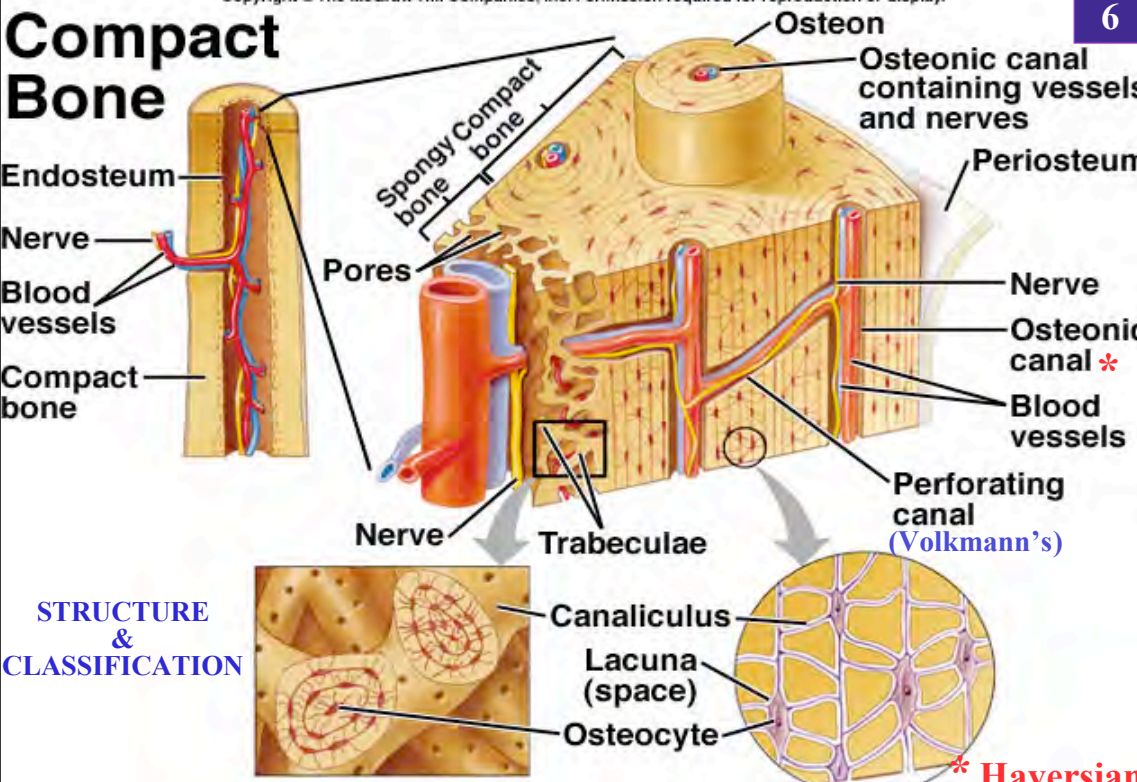
Copyright R.G. Keesel & R.H. Kardon, Tissues and Organs: A Text-Atlas of Scanning Electron Microscopy, 1979 (W.H. Freeman & Co.)

## STRUCTURE & CLASSIFICATION

# COMPACT BONE

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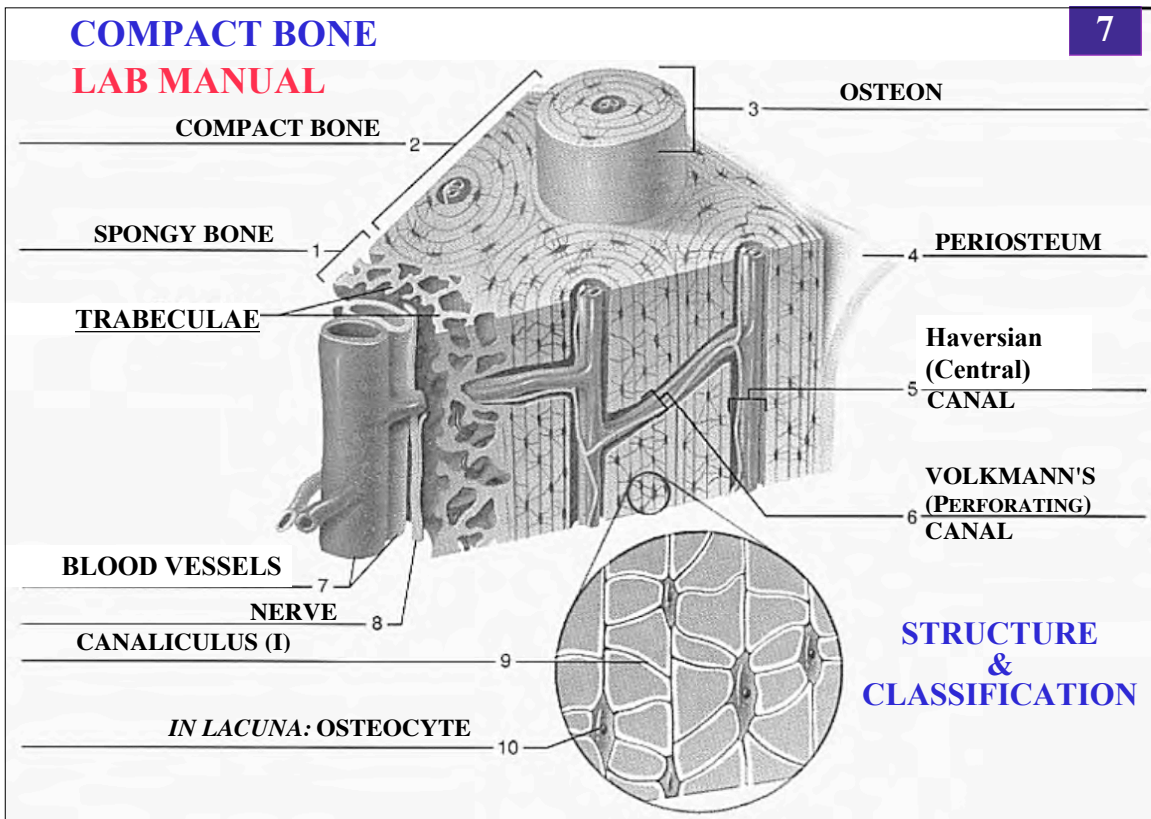
## Compact Bone



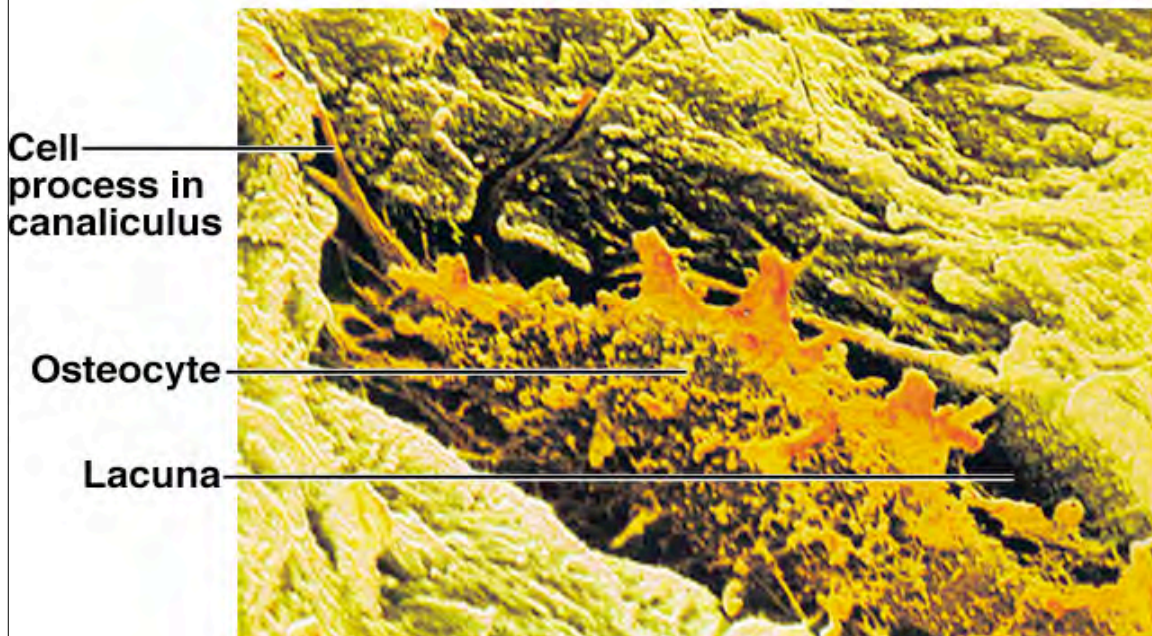
Osteon  
Osteonic canal containing vessels and nerves  
Periosteum  
Nerve  
Osteonic canal \*  
Blood vessels  
Perforating canal (Volkman's)  
Trabeculae  
Nerve  
Canaliculus  
Lacuna (space)  
Osteocyte  
\* Haversian

Endosteum  
Nerve  
Blood vessels  
Compact bone  
Spongy bone  
Pores

STRUCTURE & CLASSIFICATION



## Osteocyte within Lacuna



**PART A**

Complete the following statements:

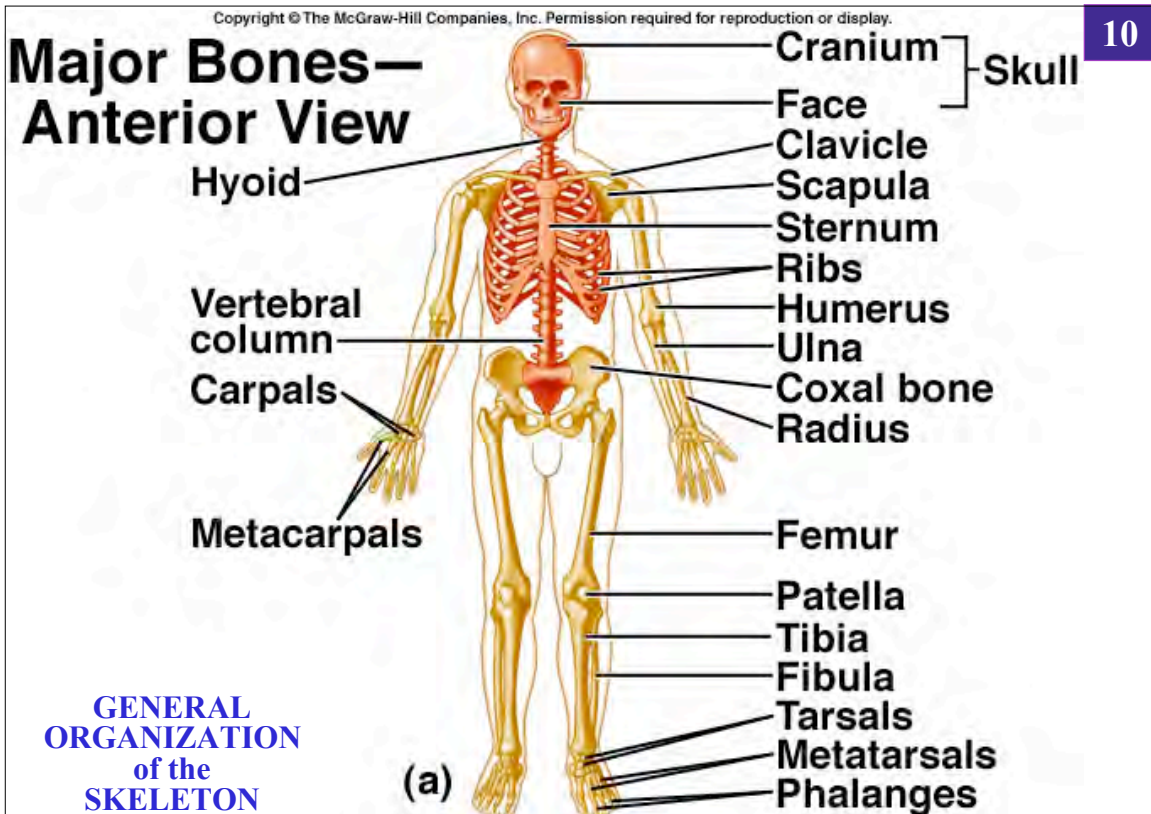
1. A bone that is platelike is classified as a(an) FLAT bone.
2. The bones of the wrist are examples of SHORT bones.
3. The bone of the thigh is an example of a(an) LONG bone.
4. Vertebrae are examples of IRREGULAR bones. ROUND OR SESAMOID bone.
5. The patella (kneecap) is an example of a very large FLAT bone.
6. The bones of the skull that form a protective covering of the brain are examples of FLAT bones.
7. Distinguish between the epiphysis and the diaphysis of a long bone. EPIPHYSIS: EXPANDED ENDS OF A LONG BONE  
DIAPHYSIS: SHAFT BETWEEN THE ENDS OF A LONG BONE.
8. Describe where cartilage is found on a long bone. HYALINE CARTILAGE COVERS THE ARTICULAR ENDS OF A LONG BONE.
9. Describe where dense connective tissue is found on a long bone. DENSE CT COMPRISES PERIOSTEUM THAT ENCLOSES BONE (EXCEPT FOR ARTICULAR ENDS).
10. Distinguish between the periosteum and the endosteum. PERIOSTEUM: OUTER COVERING OF A BONE  
ENDOSTEUM: LINES HOLLOW, INTERNAL CHAMBERS

**PART B**

Complete the following:

1. What differences did you note between the structure of compact bone and spongy bone?  
COMPACT BONE: OSTEONS PACKED CLOSELY TOGETHER  
SPONGY BONE: LARGE SPACES BETWEEN BONY PLATES (TRABECULAE).
2. How are these differences related to the functions of these types of bone?  
COMPACT BONE: STRENGTH IN SHAFT & BONE BORDER  
SPONGY BONE: WEIGHT REDUCTION OF BONE & RED MARROW SPACE.
3. From your observations, how does the marrow in the medullary cavity compare with the marrow in the spaces of the spongy bone?  
MEDULLARY CAVITY: MARROW IS YELLOW  
SPONGY BONE: RED MARROW

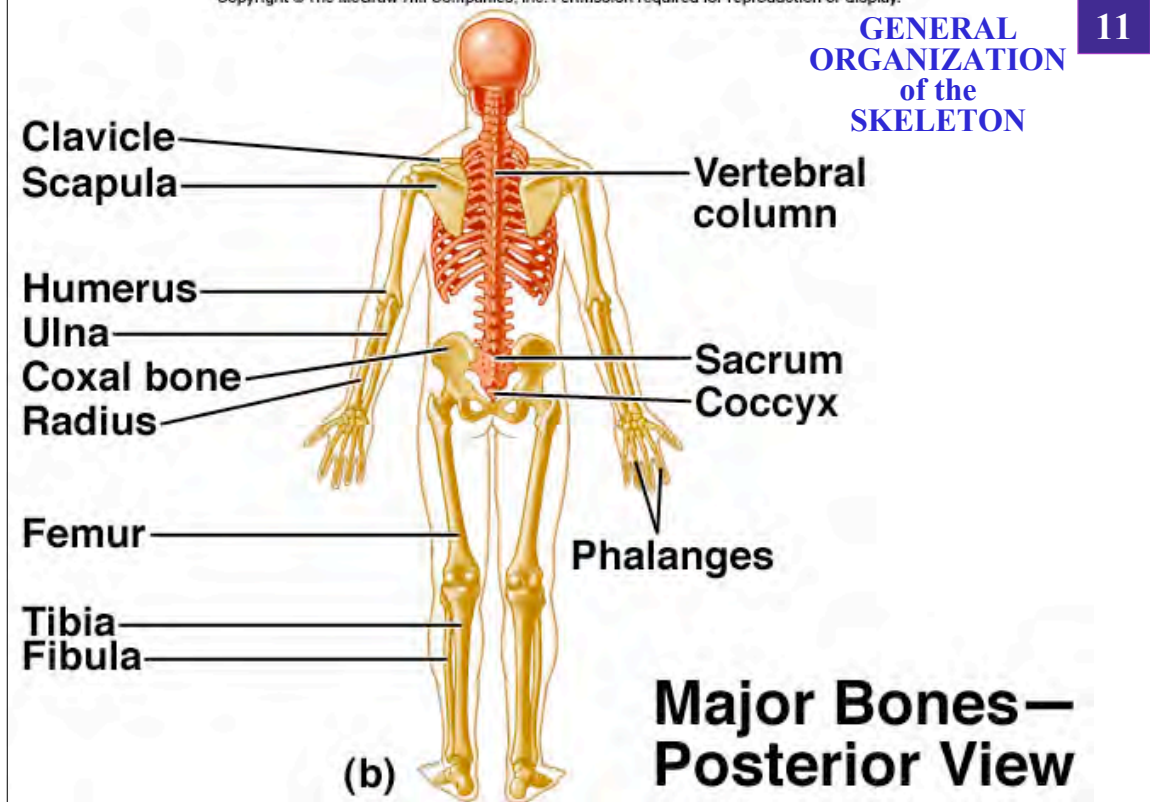
**STRUCTURE  
&  
CLASSIFICATION  
LAB MANUAL**



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**GENERAL  
ORGANIZATION  
of the  
SKELETON**

**11**



**12**

**Self-Test**

**Skeleton: General**

<http://www.bio.psu.edu/faculty/strauss/anatomy/skel/skeletal.htm>

**Students are responsible for all  
of the material in  
Exercises 11 and 12  
(Laboratory Manual)**

**Last Plate**