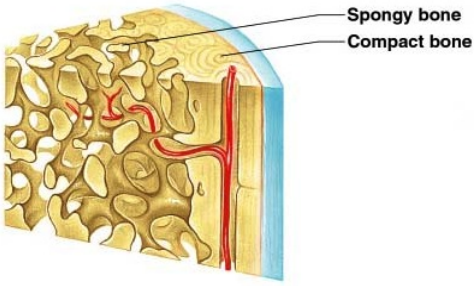
Unit 3: Skeletal System
Chapter 6.1

NOTES: Skeletal System & Bones Part 1

Overview of Skeletal System:

Skeletal System includes:
- **Bones**
- **Joints**
- **Cartilage**
- **Tendons (bone to muscle)**
- **Ligaments (bone to bone)**

Function of the Skeletal System
- _____ of the body
- _____ of soft organs
- _____ due to attached skeletal muscles
- _____ of minerals and fats
- _____ formation



Types of Bone Tissue
- _____: Hard outer layer of bone
- _____: Less dense, small needle-like pieces of bone (_____)
  - Many _____
- _____: Soft tissue inside bone that produces blood cells

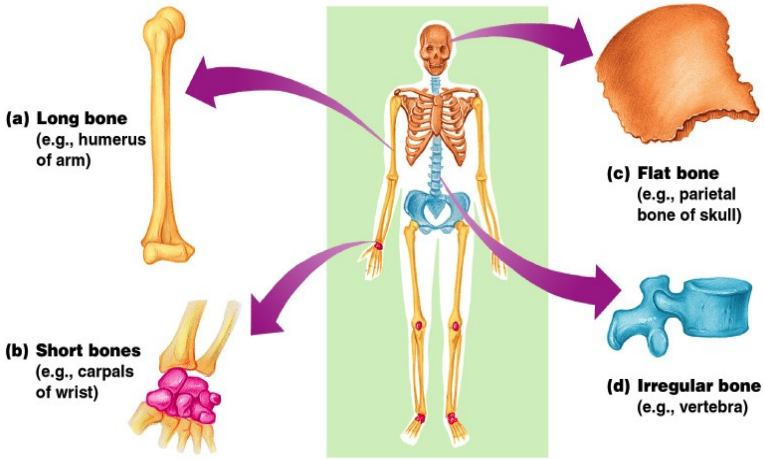
Classification of Bone
- Bones are classified according to shape

1. Long Bones
- Typically _____
- Have a shaft with heads at both ends
- Contain mostly _____
- Examples: Femur, humerus

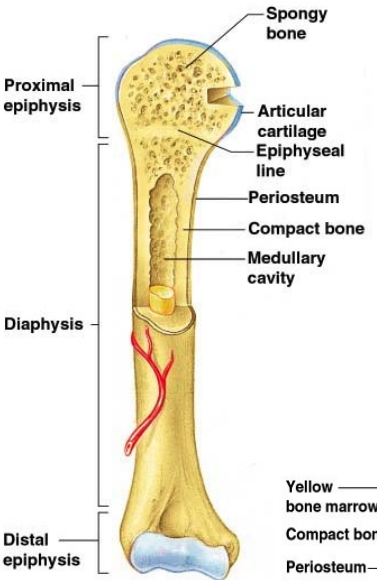
2. Short bones
- Generally _____
- Contain mostly _____
- Examples: Carpals, tarsals

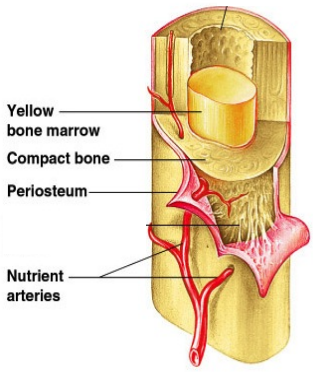
3. Flat bones
- _____
- Usually curved
- Thin layers of compact bone around a layer of spongy bone
- Examples: Skull, ribs, sternum

4. Irregular bones
- _____
- Do not fit into other bone classification categories
- Example: Vertebrae and hip

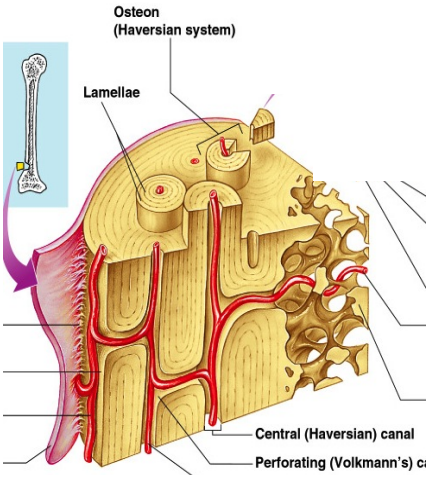


Gross Anatomy of Long Bone



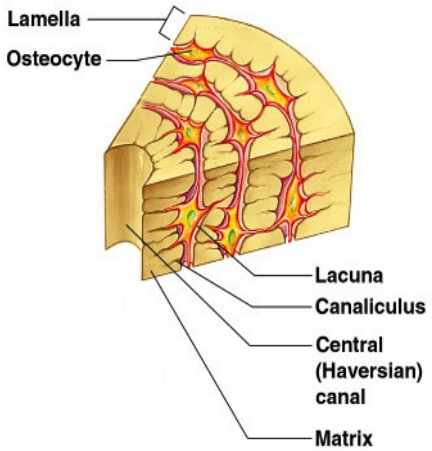


- Diaphysis - Shaft
  - Composed of _____
  - Location of _____ (fat)
- Epiphysis - Ends of the bone
  - Composed mostly of _____
  - Location of _____ (blood formation)
- Periosteum
  - _____ of the diaphysis
  - Fibrous connective tissue membrane
- Arteries
  - _____ bone cells with _____
- Articular cartilage
  - Covers the external surface of the epiphyses
  - Made of hyaline cartilage
  - _____ at joint surfaces
- Medullary cavity
  - Cavity of the shaft
  - Contains _____ (mostly _____) in adults
  - Contains _____ (for blood cell formation) in infants



Microscopic Anatomy of the Bone

- _____ (Haversian System)
  - A unit of bone
- _____ (Haversian) _____
  - Opening in the center of an osteon
  - _____
- _____
  - Cavities containing bone cells (osteocytes)
  - Arranged in concentric rings
- Lamellae
  - Rings around the central canal
  - Sites of lacunae
- Canaliculi
  - _____
  - Radiate from the central canal to lacunae
  - Form a _____



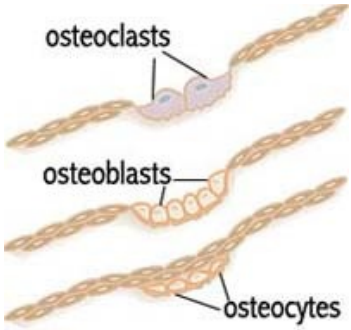
Ossification: Bone Growth

- _____ allow for growth of long bone during childhood
  - New cartilage is continuously formed
  - Older cartilage becomes ossified (changed to bone)
    - Cartilage is broken down
    - _____
- Bones are remodeled and lengthened until growth stops
  - Bones change shape somewhat

- Bones grow in width

Types of Bone Cells

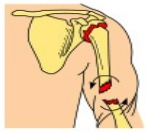
- _____
  - Mature bone cells
- _____
  - Bone-_____ cells for _____
- _____
  - Bone-_____ cells
  - Break down bone matrix for remodeling and release of calcium
- Bone remodeling is a process done by both osteoblasts and osteoclasts



Bone Fractures

- _____
- Types of bone fractures
  - _____ (simple) fracture – break that does not penetrate the skin
  - _____ (compound) fracture – broken bone penetrates through the skin
- Bone fractures are treated by reduction and immobilization
  - Realignment of the bone

Common Types of Fractures

Fracture type	Illustration	Description	Comment
Comminuted		Bone breaks into many fragments.	Particularly common in the aged, whose bones are more brittle.
Compression		Bone is crushed. (i.e., osteoporotic bones).	Common in porous bones
Depressed		Broken bone portion is pressed inward.	Typical of skull fracture.
Impacted		Broken bone ends are forced into each other.	Commonly occurs when one attempts to break a fall with outstretched arms
Spiral		Ragged break occurs when excessive twisting forces are applied to a bone.	Common sports fracture.
Greenstick		Bone breaks incompletely, much in the way a green adults.	Common in children, whose bones are more flexible than those of

Repair of Bone Fractures

- _____ (blood-filled swelling) is formed
- Break is _____ (immobilized) by _____ to form a callus
- Fibrocartilage callus is replaced by a _____
- Bony callus is _____ to form a permanent patch

Learning Goals:
1. Describe the functions of the skeletal system.
2. Differentiate between the 4 types of bones. Give an example of each.
3. Explain how ossification works
4. Compare the 3 types of bone cells.
5. Summarize how bone fractures are repaired.