Skeletal System

Unit 4
Miss Wheeler
Parts of the Skeletal System

- Bones
- Joints
- Cartilages
- Ligaments (bone to bone) and tendons (bone to muscle)
Functions of the Skeletal System

1. Movement
2. Support
3. Protection
4. Make blood cells
5. Store minerals
2 Major Parts of Skeleton

1. **Axial Skeleton**
   - Includes skull, spine, ribs, sternum

2. **Appendicular Skeleton**
   - Includes appendages of the body (shoulders, arms, hips, and legs)
Bones

- Adult skeleton has 206 bones
- Two basic types of bone tissue:
  1. **Compact bone** - dense throughout
  2. **Spongy bone** - many open spaces
Classification of Bones

(a) Long bone (humerus of arm)
(b) Short bone (carpal of wrist)
(c) Flat bone (sternum)
(d) Irregular bone (vertebra)
Long Bones

- Long in shape
- Shaft with heads at both ends
- Mostly compact bone
- Example: Femur, humerus

(a) Long bone
(humerus of arm)
Anatomy of Long Bones

- **Diaphysis** - Length of bone made of compact bone
- **Epiphysis** - Ends of bone made of mostly spongy bone
- **Epiphyseal line/plate** - In the epiphysis, where bone grows from
- **Articular cartilage** - covers surface of epiphysis to reduce friction
Anatomy of Long Bones

- **Periosteum**: covers diaphysis
- **Endosteum**: lines the inside of diaphysis
- **Medullary cavity**: cavity inside the shaft; contains yellow marrow (fat) and red marrow (for blood cell formation)
Short Bones

- Cube-shape
- Mostly spongy bone
- Example: carpals, tarsals

(b) Short bone (carpal of wrist)
Flat Bones

- Thin, flat, usually curved
- Two thin layers of compact bone on outside
- Layer of spongy bone on inside
- Example: skull, ribs, sternum

(c) Flat bone (sternum)
Irregular Bones

- Irregular shape
- Don’t fit into other bone categories
- Example: hip bones, vertebrae

(d) Irregular bone (vertebra)
Bone Markings

- Bone markings are features of bones where muscles, tendons, ligaments can attach, as well as passages for nerves and blood vessels.

- **Projection/Process** - Grow out from the bone surface

- **Depression/Cavity** - Indentations in the bone
Bone Growth & Development

- **Ossification** - The process of forming the bones of the body
- **BIRTH** - Bones are mostly cartilage; soft
- **INFANTS & CHILDREN** - Calcium and phosphorus are laid down to form bone.
- **TEENS** - Bones grow longer; occurs at growth (epiphyseal) plates
- **EARLY 20s** - Growth stops (earlier for females)
- **20s & ON** - Bone does not grow longer, but will continue to break down and form new bone
Bone Growth Steps Summary

- Cartilage from early years is broken down
- Bone replaces cartilage - **ossification**
  - Growth of long bones from **epiphyseal plates**
- Bone remodeling happens throughout life due to:
  - Calcium levels in blood
  - Pull of gravity and muscles on the bones
Bone Cells

- **Osteocytes** - Mature bone cells

- **Osteoblasts** - Bone-forming cells

- **Osteoclasts** - Bone-destroying cells. Break down bone matrix for remodeling and release of calcium