

## UNIT B: HUMAN BIOLOGY

### CHAPTER 1: SYSTEMS, SUPPORT, AND MOVEMENT

#### SECTION 1.2: THE SKELETAL SYSTEM PROVIDES SUPPORT AND PROTECTION *(pages B14-B20)*

#### Bones are Living Tissue

**Skeletal System** – The framework of bones that supports the body, protects internal organs, and anchors all the body's movement.

Classification of bones:

- Long bones (arms and legs)
- Short bones (feet and hands)
- Irregular bones (spine)
- Flat bones (ribs and skull)

Bones are living tissue.

#### Two Types of Bone Tissue:

- **Compact Bone** – The tough, hard outer layer of a bone, which protects the softer inner layer. (More dense)
- **Spongy Bone** – Strong, lightweight tissues inside a bone, makes up most of the short, flat, and irregular bones and the ends of long bones. (Less dense)

#### Marrow and Blood Cells:

Marrow – the part of the bone that produces blood cells. Fills the spaces in spongy bone. **Jelly-like substance.**

The new blood cells travel from the marrow into the blood vessels that run throughout the bone.

The blood brings nutrients to the bone cells and carries waste materials away.

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## The Skeleton is the Body's Framework

### The Axial Skeleton:

**Axial Skeleton** – The central part of the skeleton; the “axis” of the body.

Parts: Skull (cranium), spinal column (vertebrae), and the ribs.

### The Appendicular Skeleton:

**Appendicular Skeleton** – The bones of the skeleton that function to allow movement. Attached to the axial skeleton.

Parts: Shoulders, arms, hands, hips, legs, knees, feet

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## The Skeleton Changes as the Body Develops & Ages

Bones grow during infancy and childhood.

Bones become harder as they stop growing (as the person gets older).

- Infancy – A newborn's skull has several bones with spaces between them (allowing room for growth). As the brain grows so does the skull and the spaces begin to close.
- Childhood – Bone growth occurs in the “growth plates” (made of cartilage).
- Adolescence (teens) – At the end of adolescence: Bones stop growing, bones and growth plates harden, and skull plates fuse together.
- Adulthood – Bones continue their cycle (old bone breaks down, new bone is formed), but more breaks down than is reformed. Older adults lose bone mass (less density) and bones are more easily broken.

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## Joints Connect Parts of the Skeletal System

Joint – A place at which two parts of the skeletal system meet.

Ligaments – Tough bands of tissue that hold joints together. (*brainpop.com*)

Cartilage – Slick, rubbery pads that cushion the areas where bones meet. (*brainpop.com*)

### Three Types of Joints:

- Immovable Joints – Locks bones together; do not move. (Example: Skull)
- Slightly Movable Joints – Can flex slightly. (Example: Ribs)
- Freely Movable Joints – Allow the body to bend and move. (Example: Elbow, knee)

### Types of Movement:

- Angular movement – Up and down from a “hinge” joint (like your elbow or knee). (*Imagine a door opening and closing.*)
- Rotational movement – Rotates around side-to-side from a “ball-and-socket” joint (like your arm in the shoulder or leg in the hip).
- Gliding movement – Bone slides back and forth across another bone (like the vertebrae in your backbone).
- Pivotal movement – Bone pivots around an axis (like your head moving right to left as if indicating “no”)  
(*This note is from the Brainpop video.*)