SKELETAL SYSTEM

SUPPORT AND MOVEMENT
Human Biology
Support and Movement

- Clavicle
- Scapula
- Humerus
- Radius
- Ulna
- Femur
- Patella
- Tibia
- Fibula
- Cranium
- Mandible
- Sternum
- Ribs
- Ilium
- Sacrum
- Pubis
- Carpals
- Metacarpals
- Phalanges
- Ischium
- Tarsals
- Metatarsals
- Phalanges
Introduction:

• Have you ever seen a house or a skyscraper being built?

• What is the function of the metal or wooden frame of the building?
  – It supports the walls and roof of the building

• As humans we have a frame, which is our **Skeletal system**.
  – Just like a frame inside a building, our skeleton is inside our body which is called an **endoskeleton** (internal skeleton)
The Skeletal System

• Your skeletal system is made mostly of bone.

• Bone is a very hard tissue, which is also a little flexible.

• Your skeleton also contains cartilage, which is tough, flexible tissue.
  – Examples: ears & end of your nose

• The ends of some bone contain cartilage, which protects the ends of bone from rubbing against each other.
The Skeletal System cont.

- **Axial skeleton**: skull, rib cage, backbone
- **Appendicular skeleton**: shoulder, hip, pelvis, arms, legs
What are the functions of your skeletal system?

- Supports your body and gives it shape
- Covers and protects certain body organs
- Many bones of the skeleton work with muscles to make movement possible
- Some bones make blood cells
- Bones store minerals such as calcium and phosphorus that the body needs
Bones

• Your body has **206** bones.

• Bones range in various sizes.
  – Example: some are long, short, and flat

• The three bones in your ear (**incus, stapes, malleus**) are the **smallest** bones in the body.

• The **largest** bone is the **femur (thigh bone)**.
Structure of Bones

• Bones are **unusual** because they are made up of **living** and **non-living material**.

• A bone is covered with a **thin**, **tough membrane** called the **periosteum**.
  – The periosteum has many **blood vessels** that supply bone cells with blood.
Structure of Bones cont.

- The **hardest** part of the bone is called the **compact bone**, which is made up of **living bone cells**, **tough protein fibers**, and **mineral deposits**.
  - **Calcium** is the mineral that makes bone **hard** and gives bone its **strength**.
Structure of Bones cont.
• The ends of bones are made up of spongy bone, which have many spaces like a sponge.
  – Its structure adds strength to bone without adding much weight.
Structure of Bones cont.

• The space in the spongy bone are filled with **bone marrow**, which is a soft tissue.
  
  – **New blood cells** are made in **red marrow** which can be found in **spongy bone**.
  
  – The center, or **shaft**, of long bones contain **yellow marrow**, which is made mostly of **fat cells**.
Joints

• Movement can only occur where bones meet.
• The place where 2 or more bones meet is called a **joint**.
• What holds your bones together?
  – **Ligaments**: bands of tough tissue
• What happens to your ligament when you get a sprained ankle or finger?
  – **Ligaments connected to that bone stretch too far**
Types of Joints

• Hinge Joint
• Ball-and-Socket Joint
• Pivotal Joint
• Gliding Joint
Hinge Joints

• A hinge joint **allows bones to move backward and forward in only one direction.**
  – Example: knee and elbow
Ball-and-Socket Joints

- Ball-and-socket joints **permits movement in all directions**, which allows the **widest range of movement of any kind of joint**.
  
  – Example: **hip** and **shoulder**
Pivotal Joints

• Pivotal joint allows both side-to-side and up-and-down movements.

  – Example: place where the skull joins the 1st vertebra
Gliding Joints

- Gliding Joint **allows some movement in all directions, where by the bones slide along each other.**
  - Examples: wrist, ankle, vertebrae
Questions

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