


The Skeletal System



The Body's Framework

The skeletal system serves five major functions:

- **Provides a rigid supporting framework for the body.**
- **Provides protection to vital organs (due to shape and location)**
- **Provides a lever system on which the attached muscles work to produce movement.**
- **The internal portions of long and flat bones produce red blood and white blood cells as well as blood platelets which are necessary for blood clotting.**
- **Bones serve as a calcium storehouse.**

The human is made up of 206 bones and is divided into two sections:

Axial Skeleton: 80 bones

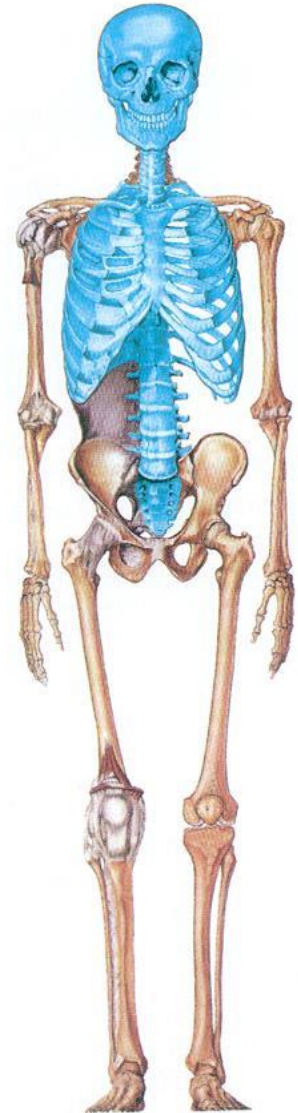
Skull: cranium - 8 bones;
face -14 bones;
auditory ossicles - 6 bones

Hyoid Bone: **1 bone**
(supports the tongue and forms part of the larynx)

Vertebral Column: **33 vertebrae**
(some are fused – usually 26 moving)

Sternum (breastbone): **3 bones fused together**

Ribs: **12 pairs** (24 bones)



Appendicular Skeleton: 126 bones

Shoulder Girdle: 2 scapulae and 2 clavicles

Arm Bones: 1 humerus, 1 radius and 1 ulna in each arm

Wrist Bones: 8 carpal bones in each wrist

Hand Bones: 5 metacarpals in each hand

Finger Bones: 14 phalanges on each hand

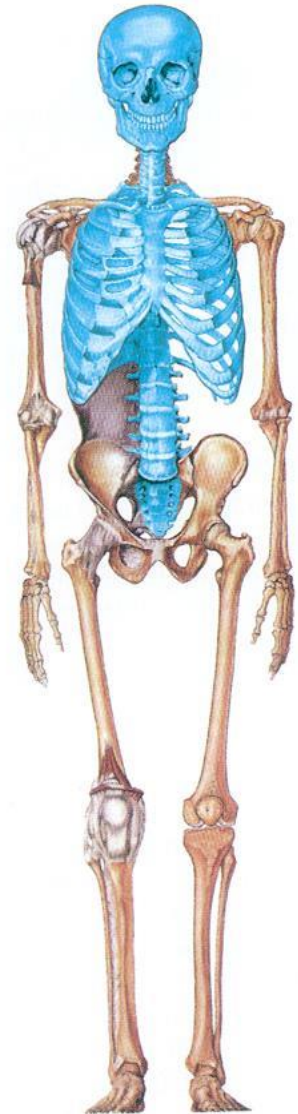
Hip Girdle: ilium, ischium, pubis (fused and immovable)

Leg Bones: 1 femur, 1 fibula and 1 tibia in each leg

Ankle Bones: 7 tarsal bones in each ankle

Foot Bones: 5 metatarsals in each foot

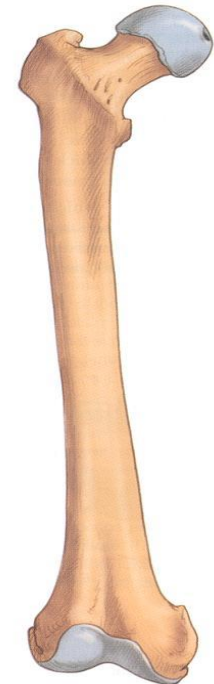
Toe bones: 14 phalanges in each foot



Bones are divided into five major classes according to their shape. The shapes of the bones allow them to perform specific functions more effectively.

Long bones

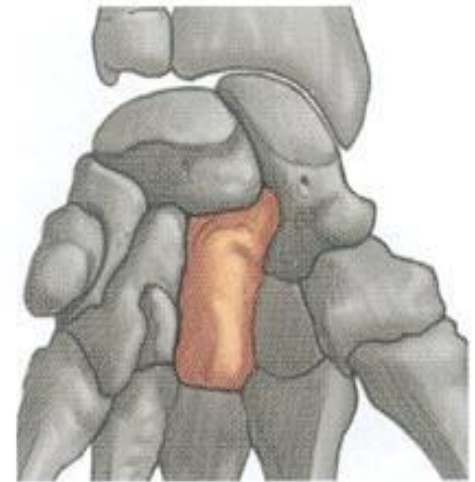
- located in the arms and legs and are characterized by long slender shafts of compact bone tissue with bumpy ends.
- slightly curved allowing them to absorb shock. They usually serve as levers in the body, allowing movement at the joint.



femur or thighbone

Short Bones

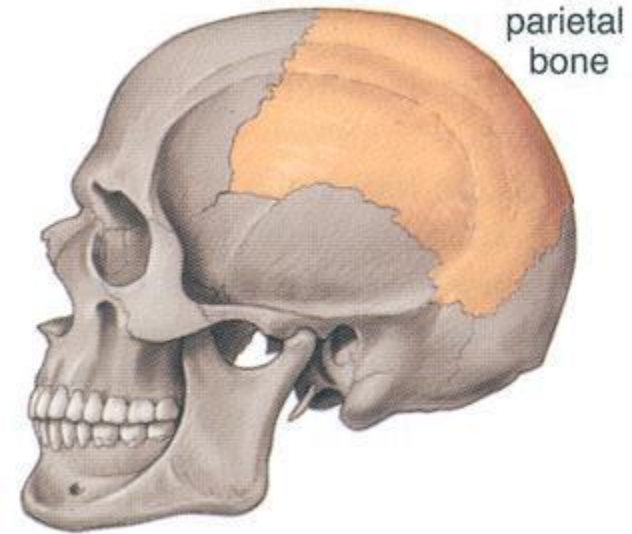
- found in the wrists ankle and knee caps and are cubicle in shape .
- these bones are found where strength is more important than mobility. Serve as good shock absorbers



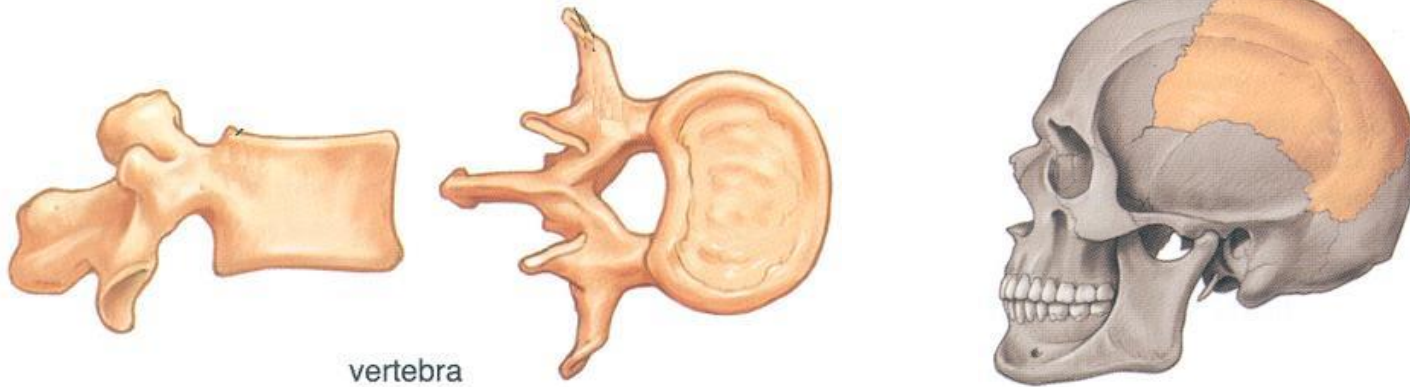
carpal or wrist bone

Flat Bones

- The skull, ribs, sternum, hips and scapula are flat, thin bones made of a plate of spongy tissue wedged between two layers of compact tissue.
- Flat bones generally serve to protect the inner organs and serve as an anchor point for muscles.



Irregular Bones



- cannot be placed in other groups
- various shapes and sizes
- fulfill special functions
- play a role in leverage, support and protection

Sesamoid Bones

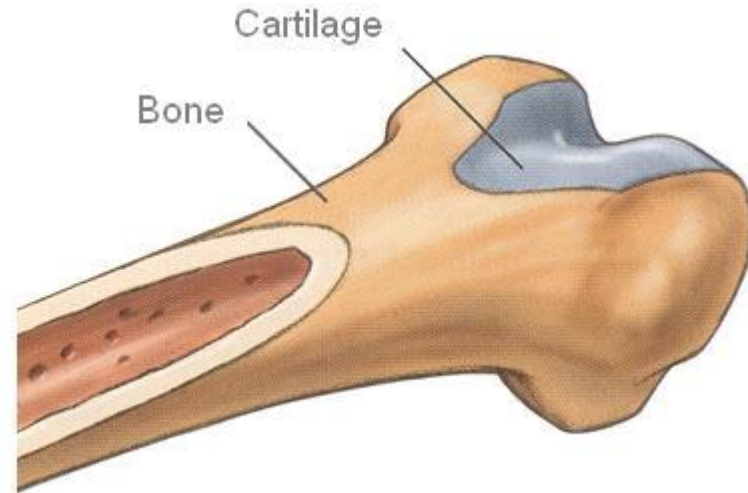
- are unusual bones because they are small, flat bones wrapped with tendons that move over bony surfaces



patella

The human skeleton is comprised of two types of tissue: **cartilage** and **bone**. Cartilage is softer than bone, less rigid and slightly elastic.

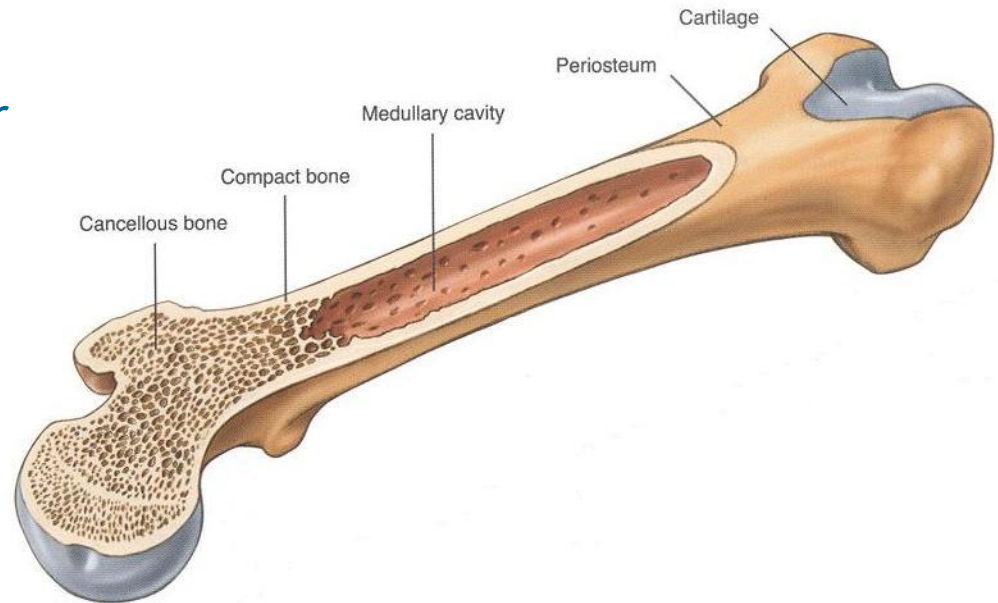
Cartilage forms the skeleton of a developing fetus, but is gradually replaced almost entirely by bone.



Some cartilage remains on the articular surface of most bones throughout life to allow for a flexible connection between the bones.

There are two types of bone tissue:

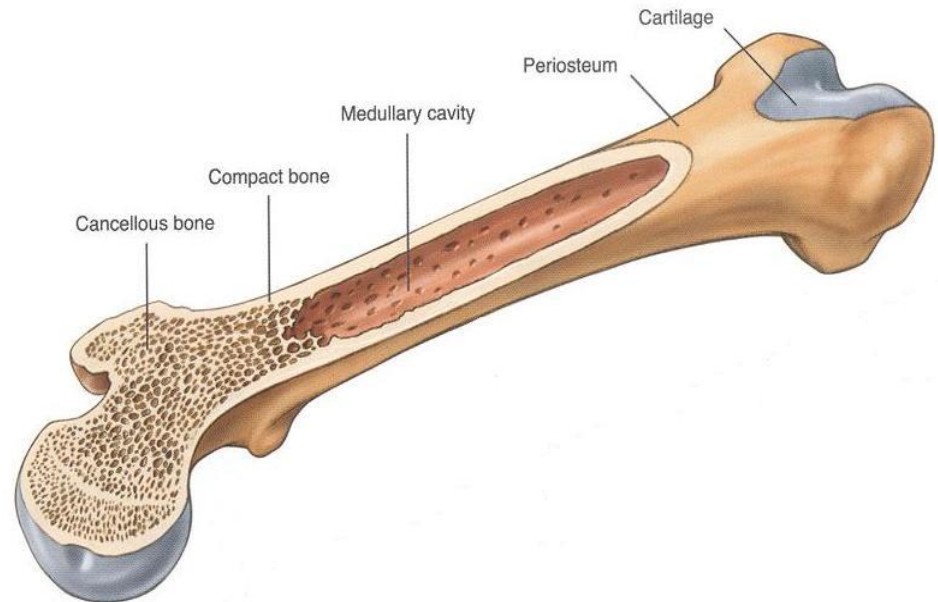
- **solid compact**
forms the outer layer
of the bone
- **spongy porous**
makes up the
inside portion of
the bone



The amount of each type of bone varies throughout life with bone becoming less flexible and more brittle with age.

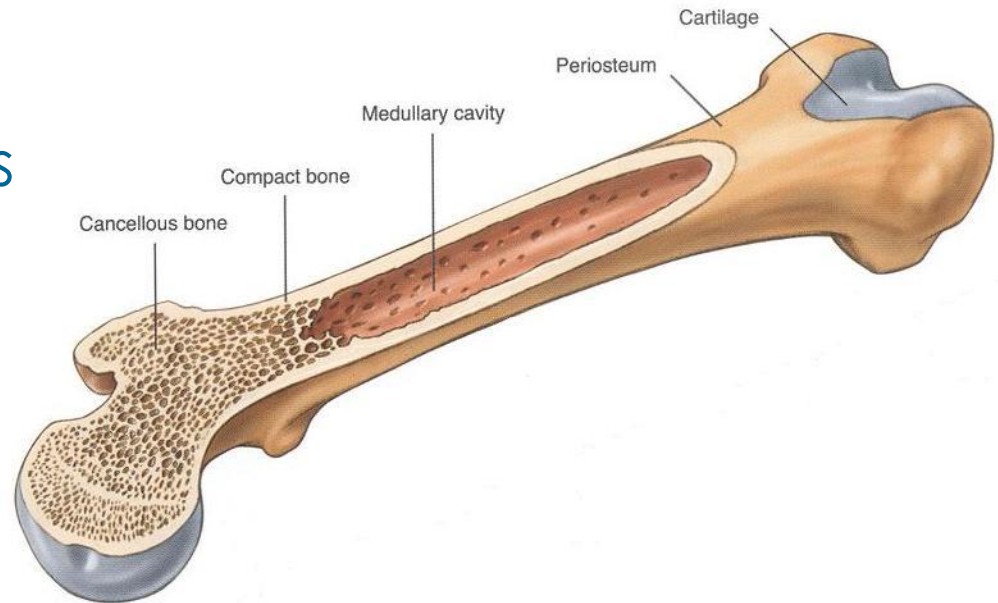
The **hardness** of a bone is due to calcium phosphate.

- Compact tissue give bone its **strength**.
- Spongy material allows for the **distribution of forces** throughout the bone helping to lessen impact.



Bone marrow is the soft, fatty inner core of the bones

Bone marrow in various bones (sternum, ribs, vertebrae, pelvis and the long bones of the arms and legs) are the **factories** of the various blood cells: **red, white, platelets**



Bone fractures are usually divided into two types: **simple** and **compound**.

Simple fractures occur when a break or crack is visible but there is no separation of the bone into parts. This type of fracture is also referred to as a greenstick or hairline fracture.

Compound fractures occur when a bone breaks into separate pieces.

A comminuted fracture occurs when the broken ends of the bone have shattered into many pieces.

