

Inside a Bone

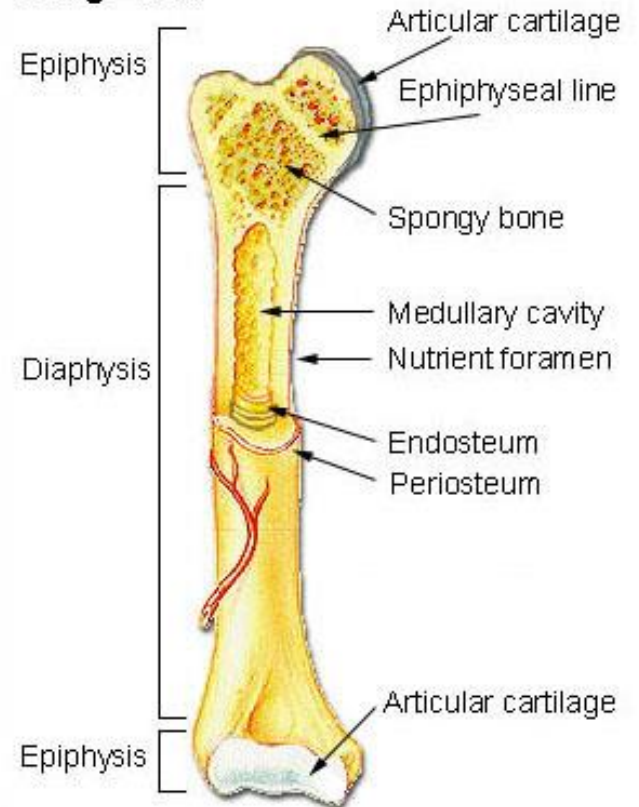
»» Bones! Bones! Bones!



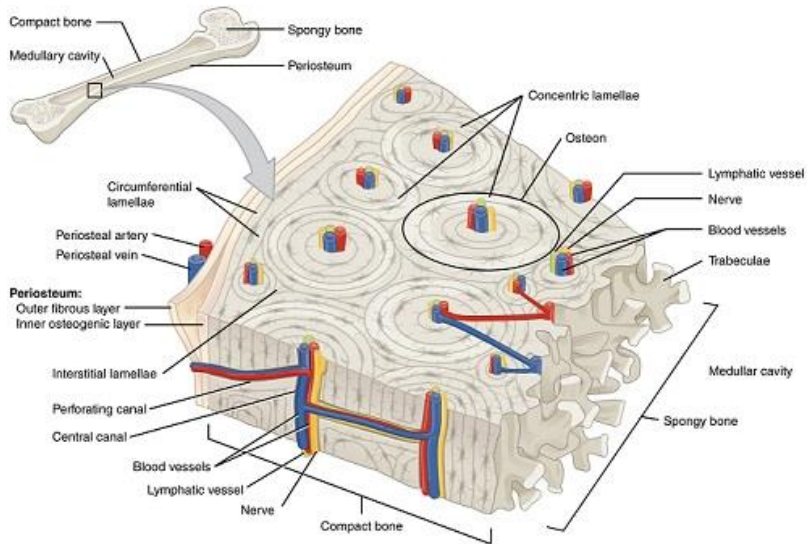
What are your bones made of ?



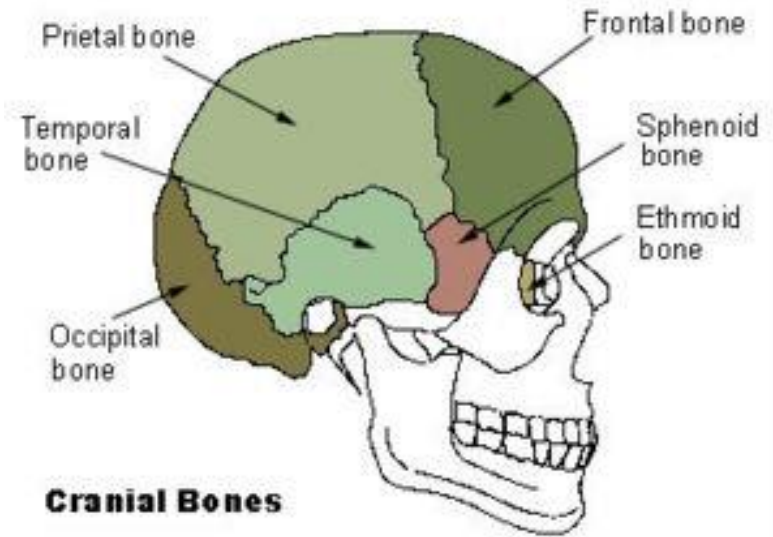
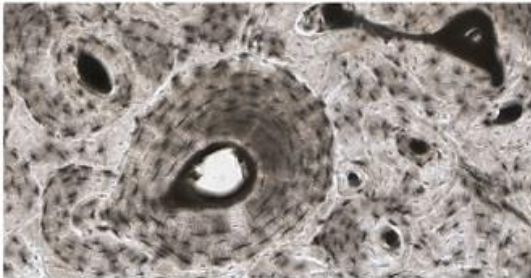
Long Bone



Inside a Bone



(a)

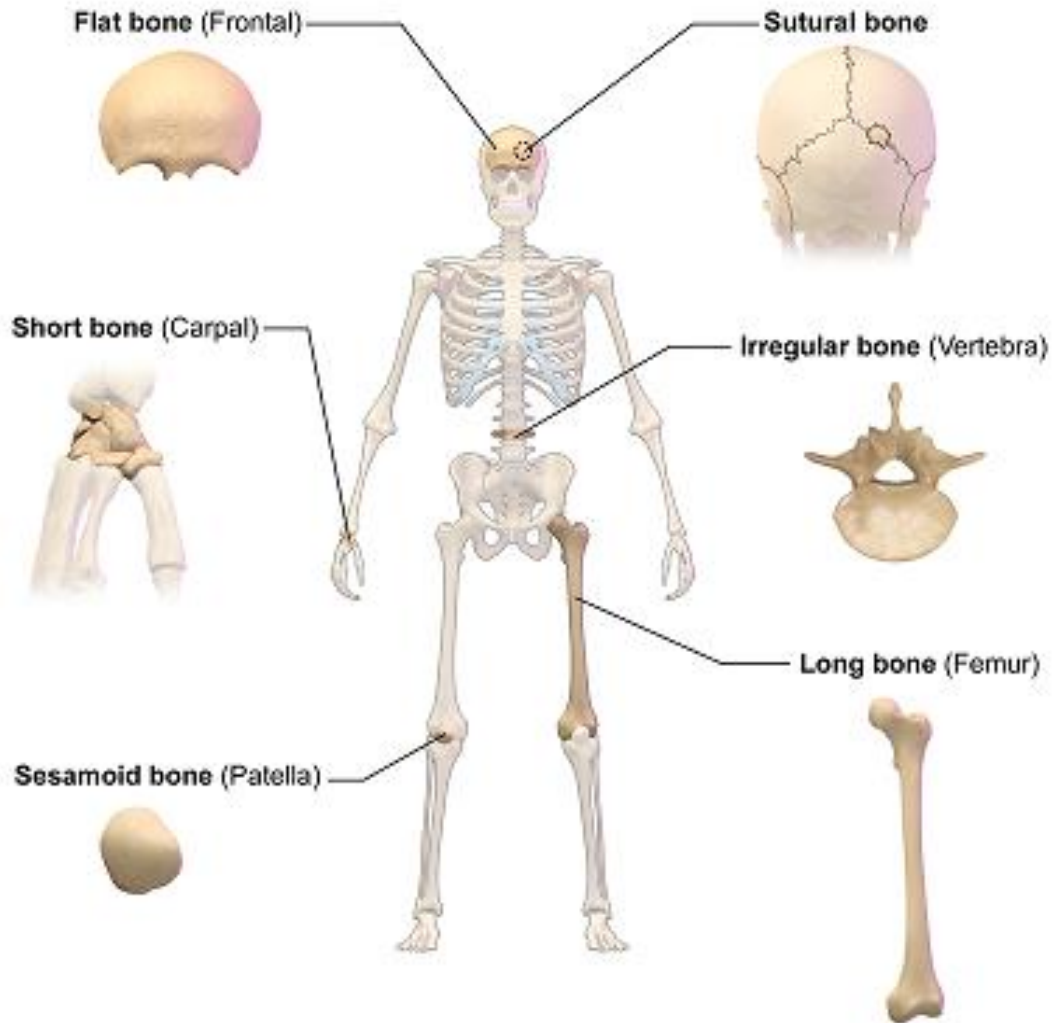


- ▶ Mineral salts
- ▶ Water
- ▶ Tissue

Bone Types

By shape:

- ▶ Long bones
- ▶ Short bones
- ▶ Flat bones
- ▶ Sesamoid bones
- ▶ Irregular bones



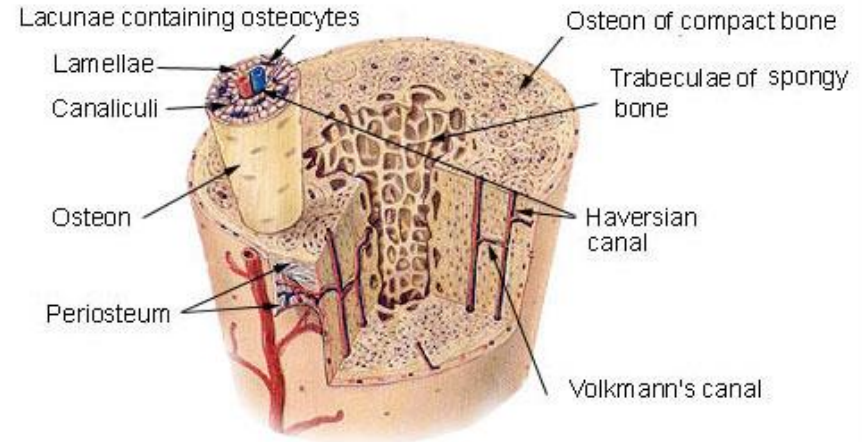
Classification of Bones by Shape

Bone Structure

Osseous tissue (bone tissue):

- ▶ Is the **mineral matrix** that forms rigid part of bone
- ▶ Contains abundant **collagen fibers** that provide strength as well as some flex
- ▶ Provides major structural and supportive **connective tissue**
- ▶ Two bone tissue types:
 - compact (cortical)
 - trabecular (spongy/cancellous)

Compact Bone & Spongy (Cancellous Bone)



Bone Composition

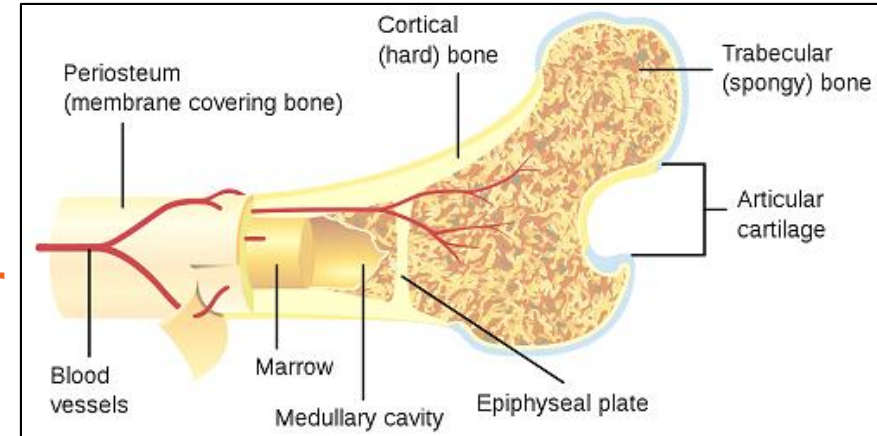
Two types of bone tissue:

▶ Compact (cortical)

- Makes the **hard outer bone layer**
- Smooth and solid
- Generally cylinder shaped
- Surgeons need saws to cut it!

▶ Trabecular (spongy/cancellate)

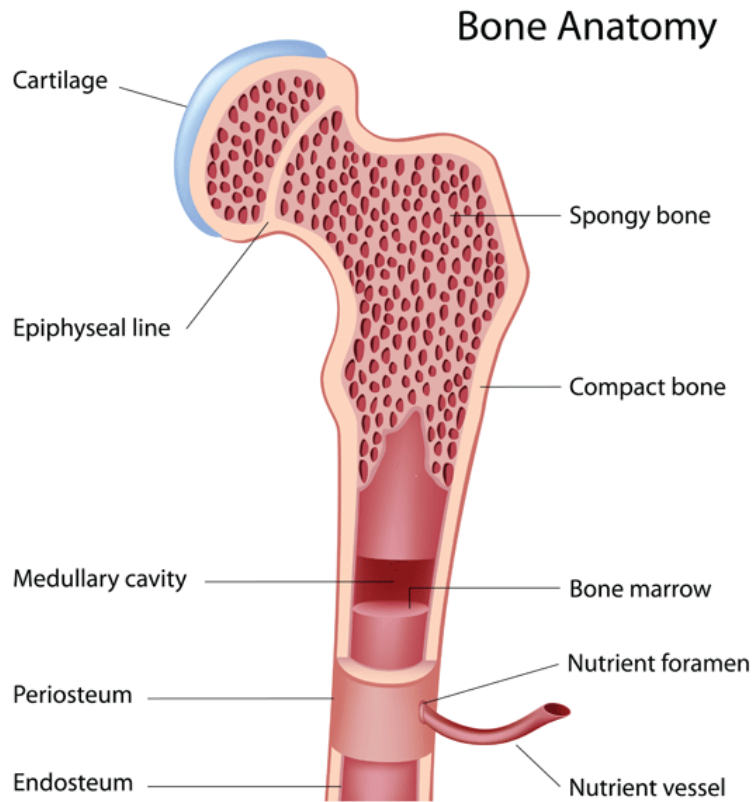
- Makes up the **bone interior**
- Light, porous, spongy and mesh-like
- Structurally similar to honeycomb



Red bone marrow in femur

Which bone tissue type is denser?

Look Closer Inside the Bone



Bone marrow

- ▶ A jelly-like substance
- ▶ In the **center of the bone**
- ▶ Produces blood cells for the body

Blood vessels

- ▶ Run through the **center of the bone**
- ▶ Deliver food, oxygen and minerals

Two Types of Bone Marrow

Red Bone Marrow

- ▶ Generates red and white blood cells & platelets
- ▶ Found in flat bones like ribs and shoulders



Yellow Bone Marrow

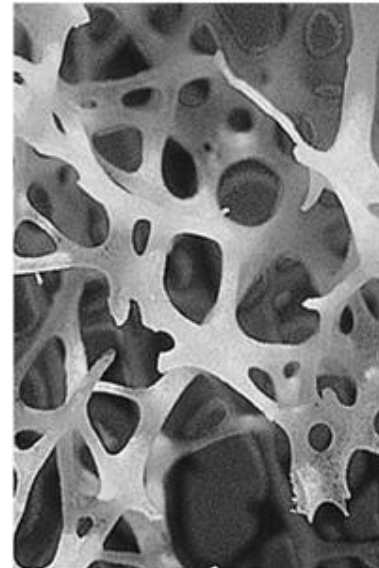
- ▶ Does not make blood cells
- ▶ Mostly fat; also stores sugar
- ▶ Found in hollow centers of long bones

Living bones are porous →

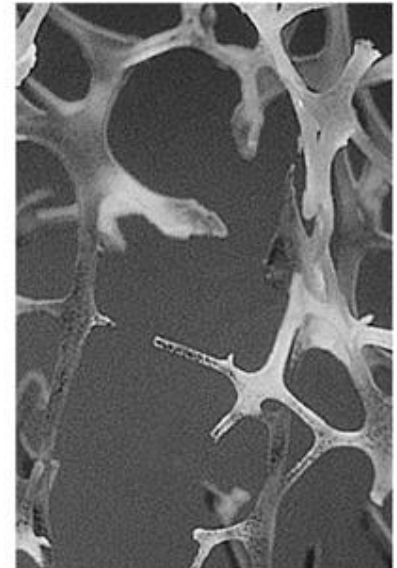


Fun Facts

- ▶ Bones are one of the strongest materials
- ▶ Bones are extremely **light**—*lighter than steel or concrete*—however they are **much stronger!**



Normal Bone



Bone with Osteoporosis