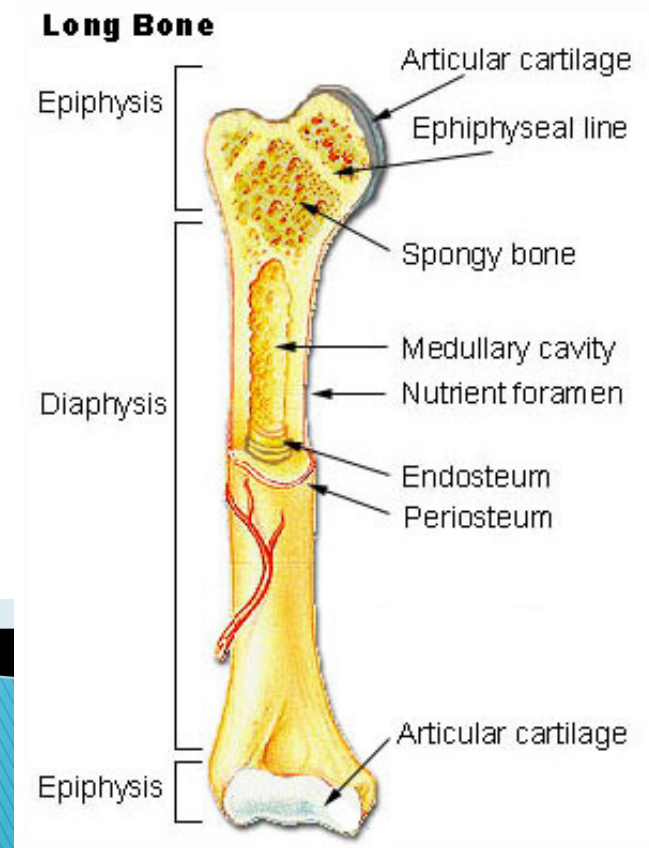


# Inside a Bone

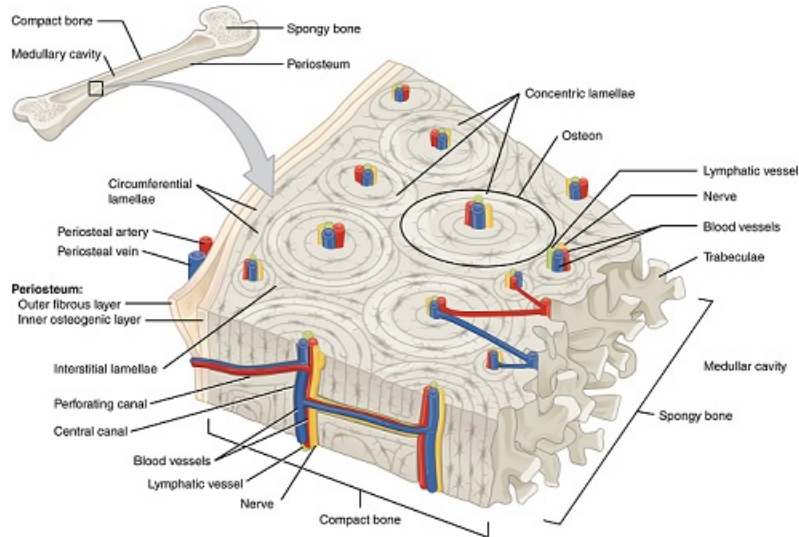
»» Bones! Bones! Bones!



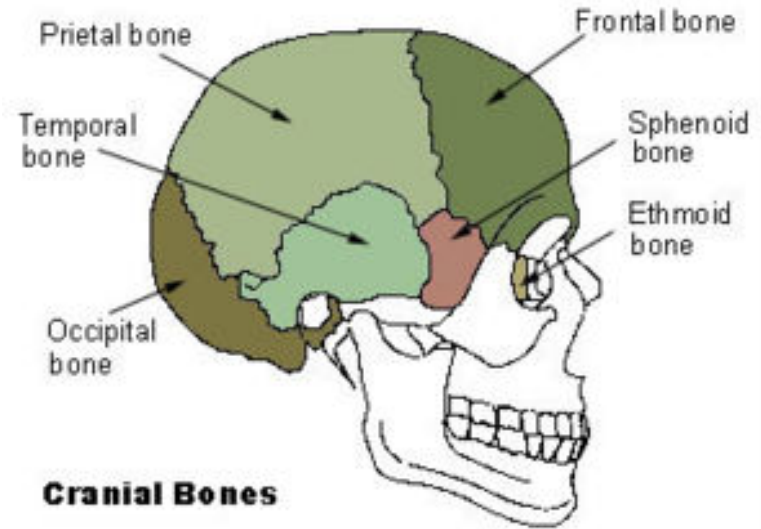
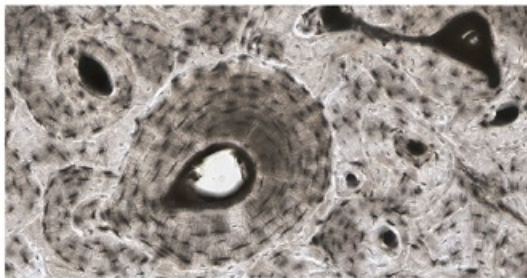
# What are your bones made of ?



# Inside a Bone



(a)



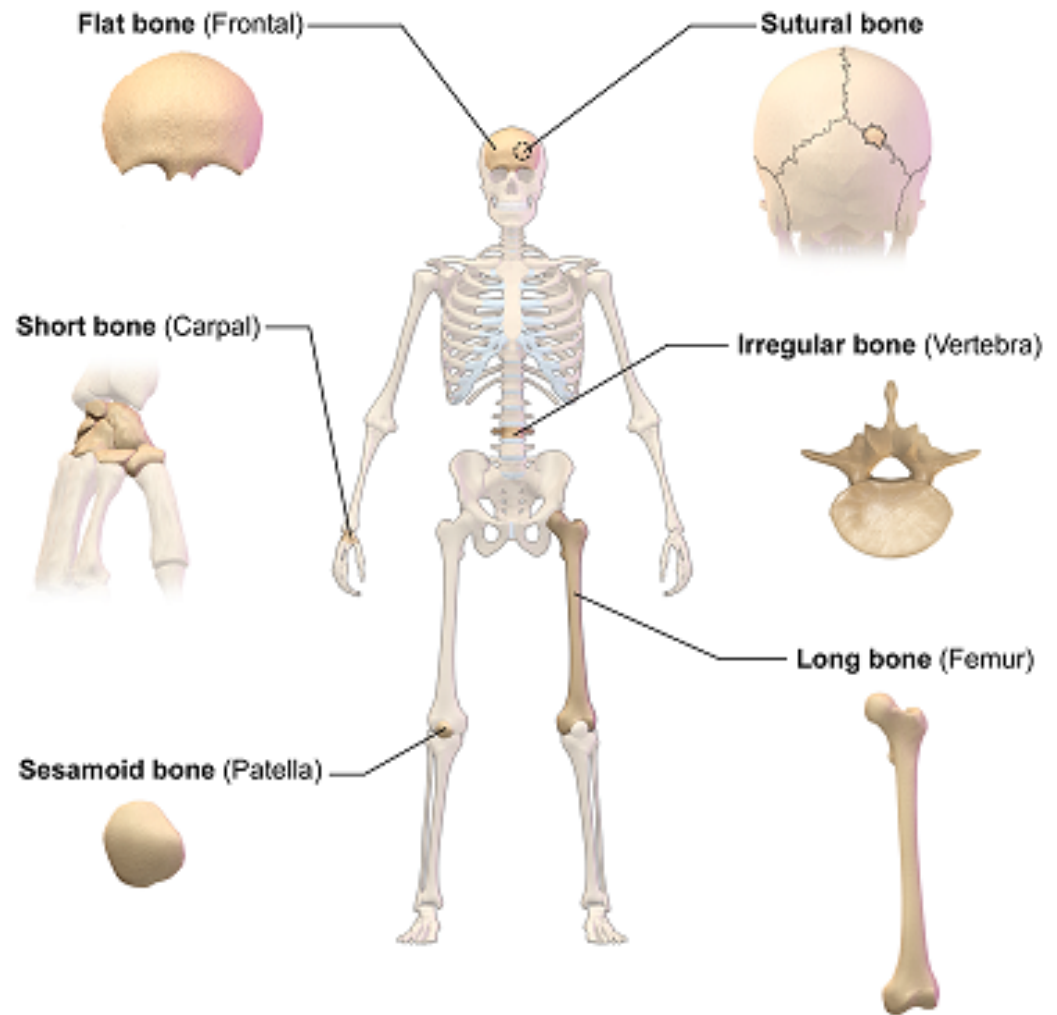
**Cranial Bones**

- ▶ Mineral salts
- ▶ Water
- ▶ Tissue

# Bone Types

By shape:

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



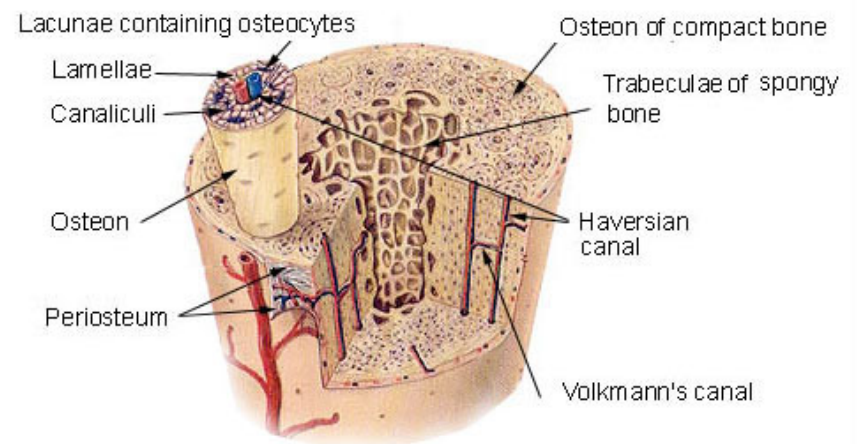
**Classification of Bones by Shape**

# 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

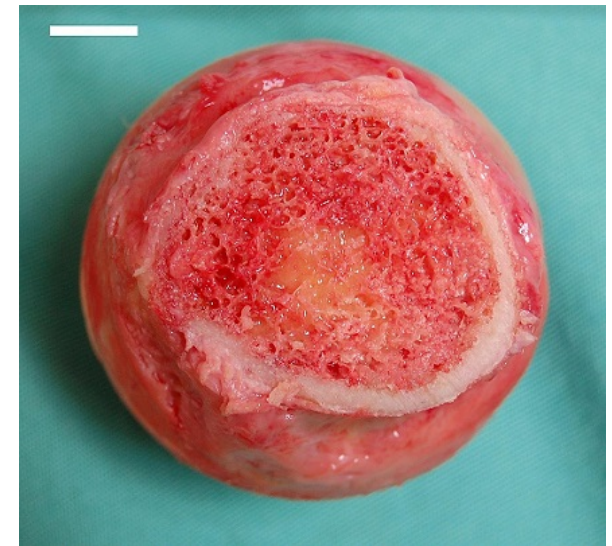
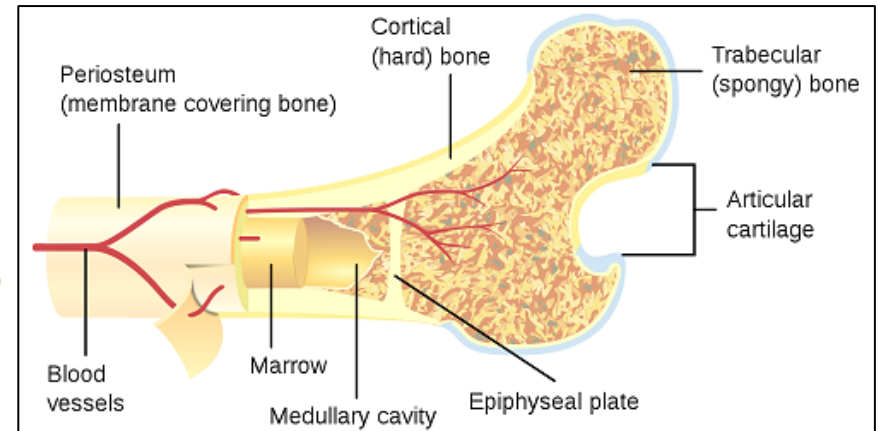
Two types of bone tissue:

▶ **Compact (cortical)**

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

▶ **Trabecular (spongy/cancellate)**

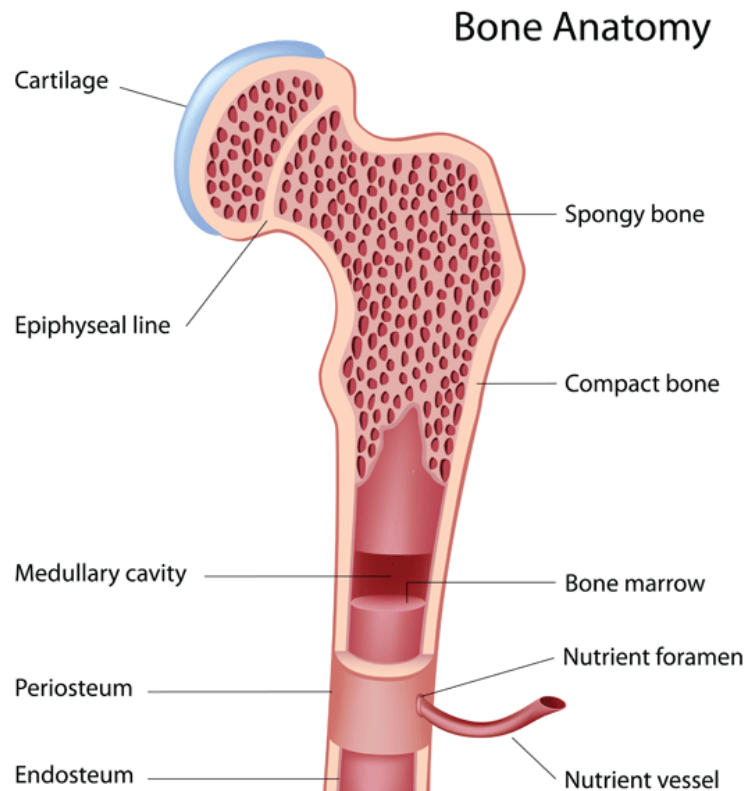
- Makes up the **bone interior**
- Light, porous, spongy and mesh-like
- Structurally similar to honeycomb



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

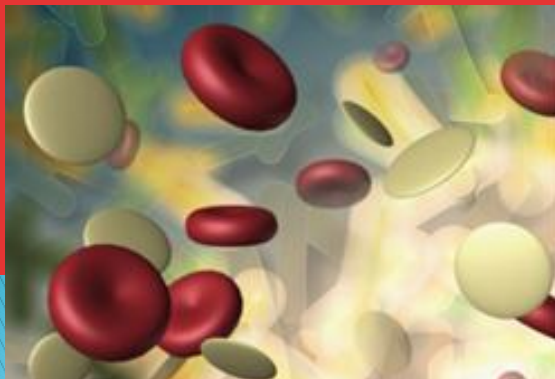
## Blood vessels

- ▶ 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

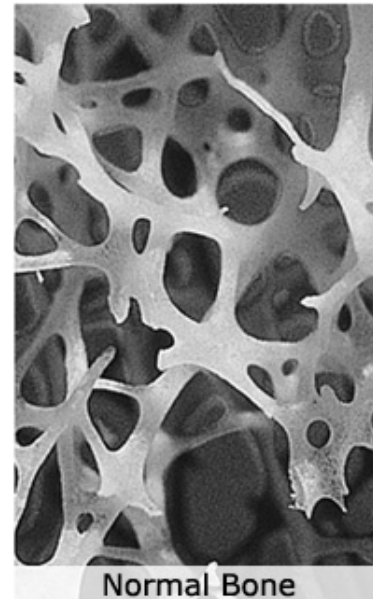


Living bones are porous →

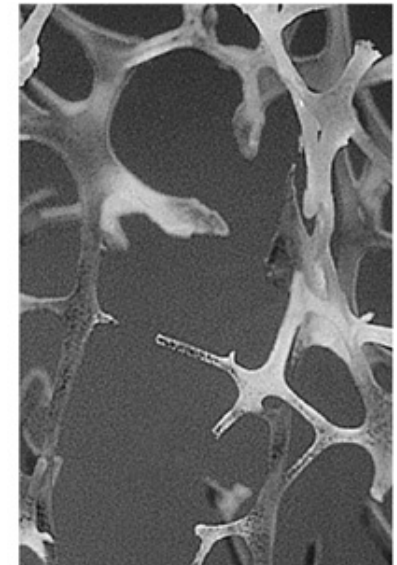


## Fun Facts

- ▶ 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