



Human skeletal system



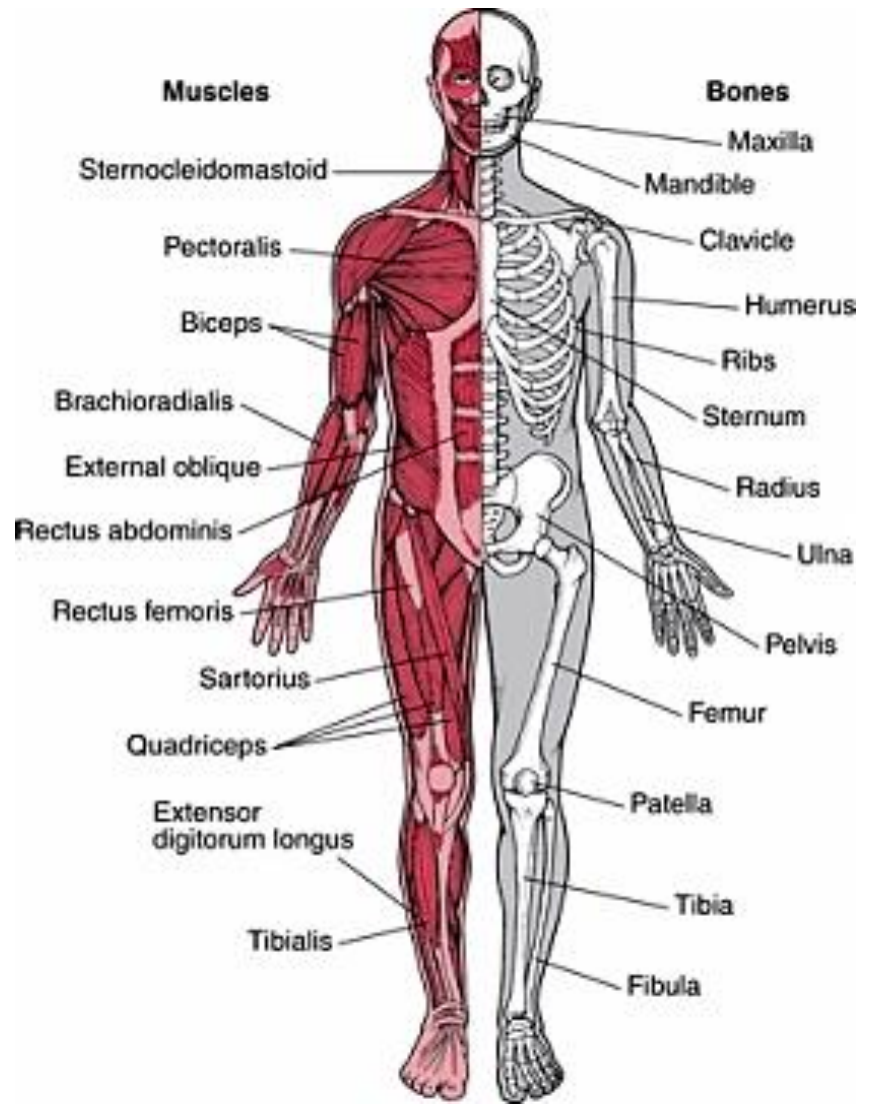
- **Locomotion system** – тірек-қимыл жүйесі, опорно-двигательная система
- **Support** – тірек, поддержка
- **Cartilage** – шеміршек, хрящ
- **Compact bone** – компактные кости, тығыз сүйек
- **Spongy bone** – жұмсақ сүйек, губчатые кости
- **Intracellular space** – жасушааралық қуыс, межклеточное пространство
- **Resorption** – жұту, поглощение
- **Sternum** – төс сүйек, грудная кость
- **Patella of knee** – тізе тостағы, чаша колени
- **Ribs** – қабырға, ребра



Locomotion system



- The movement of body is provided by skeletal and muscular systems
- They together form ***LOCOMOTION*** system





Properties of skeletal system



- Movement
- Support and giving shape
- Protection of the internal organs
- Production of blood cells
- It stores minerals such as P and Ca





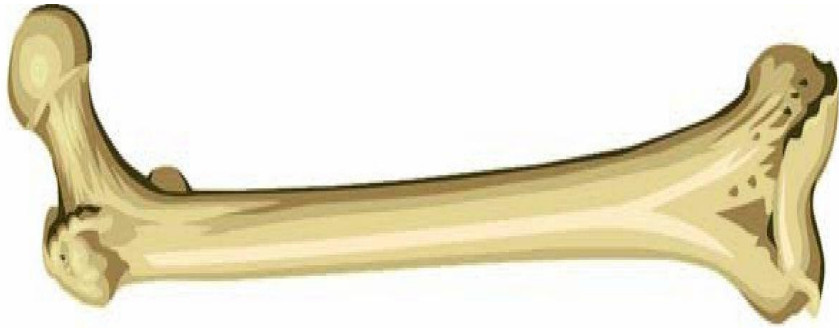
HUMAN SKELETAL SYSTEM



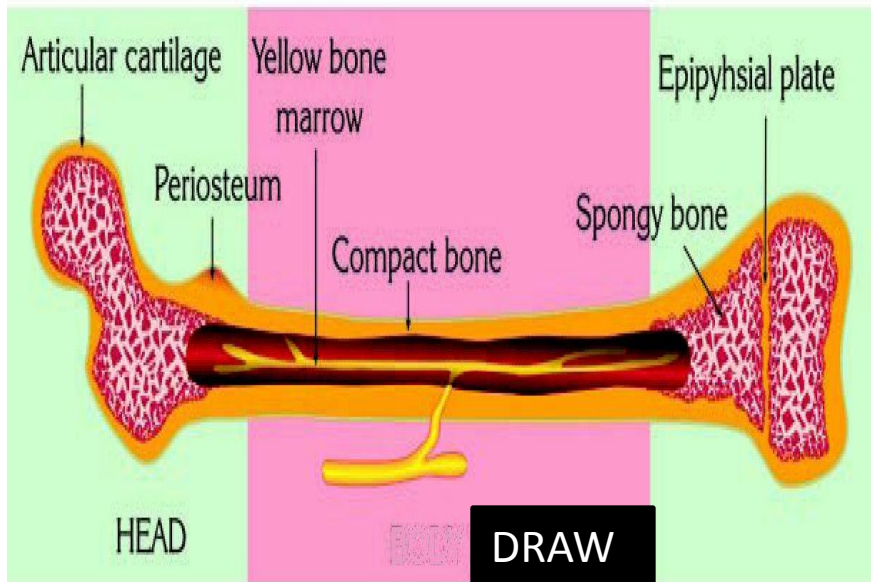
- 206 bones
- Skeleton is composed of cartilage and bone developed from ***connective tissue***
- Bone cells are called osteocytes



BONE TISSUE

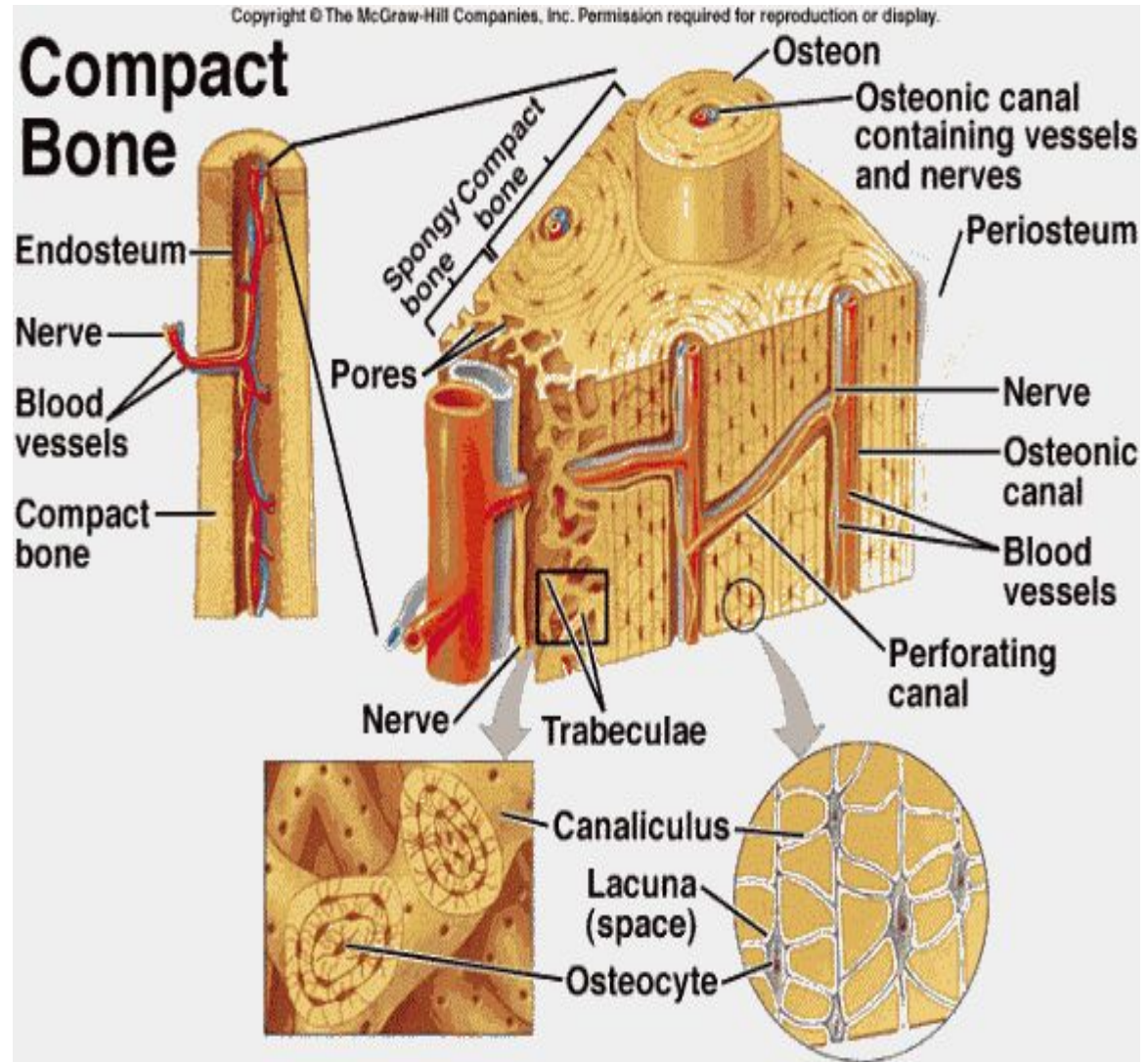


- COMPACT BONE that is very dense and strong
- SPONGY BONE that is porous and soft
- The spaces in spongy bones are filled with a soft tissue called ***marrow***
- red marrow – produces red blood cells
- yellow marrow – stores fat and energy

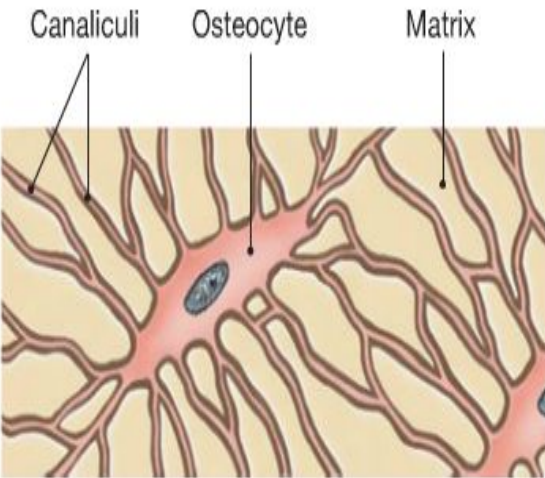
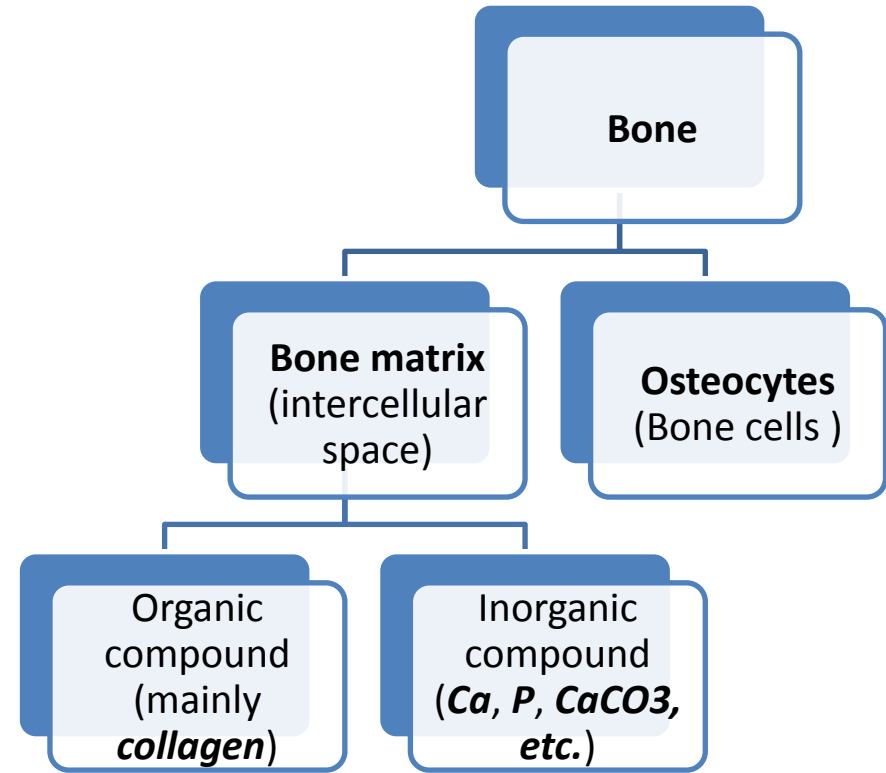


- Osteocytes are connected by ***cytoplasmic bridges***
- Osteonic canal (Haversian canal) contains blood vessels and nerves
- Periosteum (outer membrane) that provide production of new bone for growth and repair

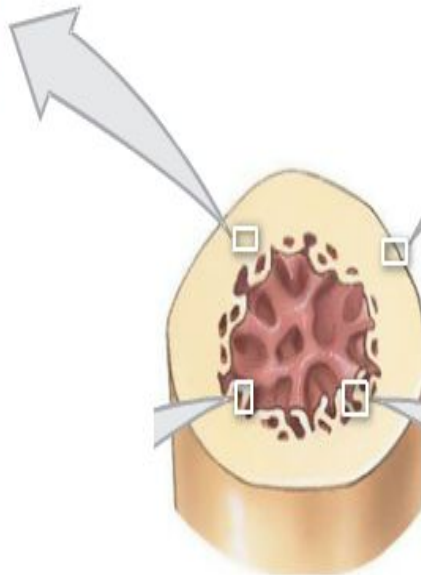
Structure of a bone



Chemistry of a bone



Osteocyte: Mature bone cell that maintains the bone matrix

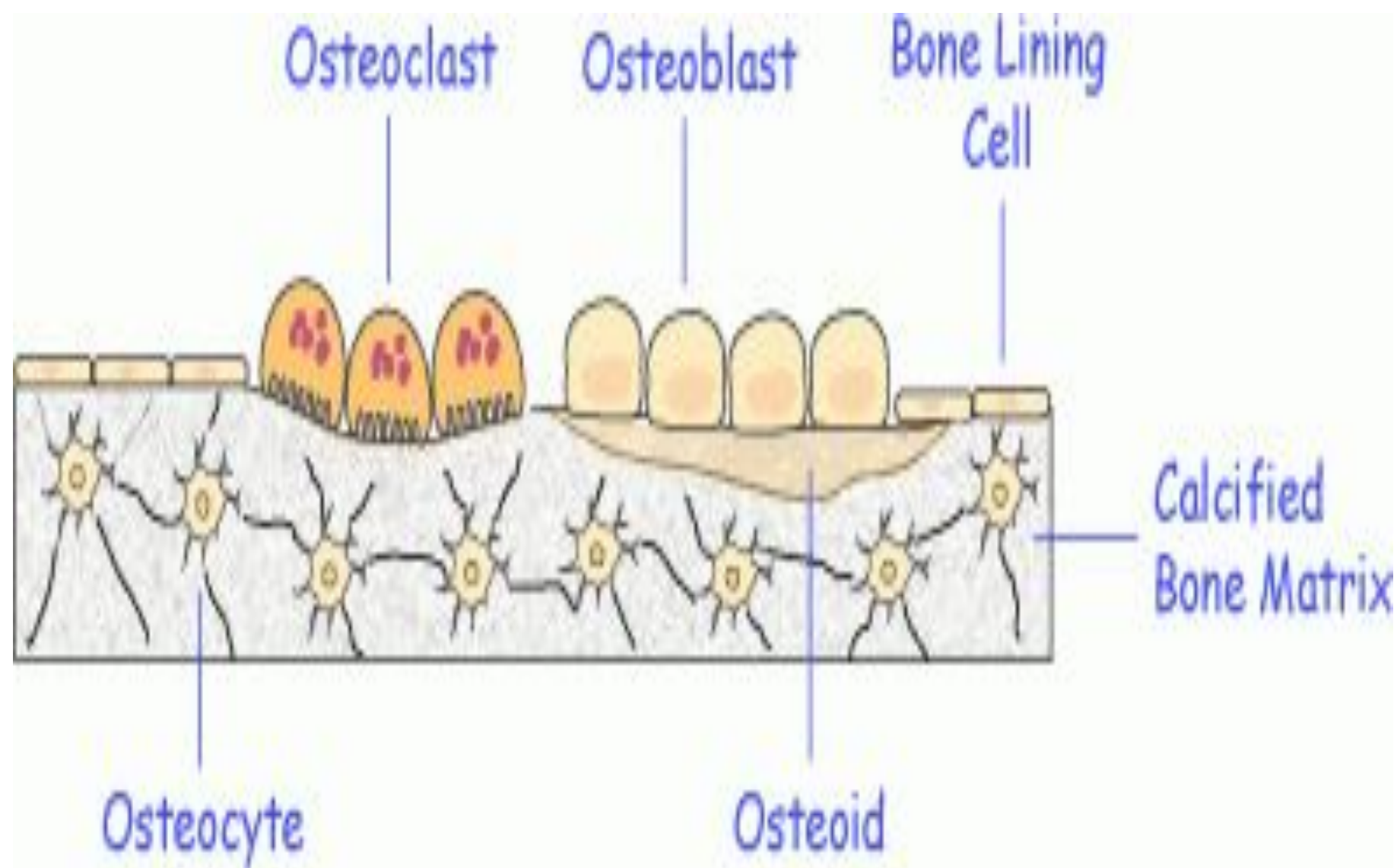


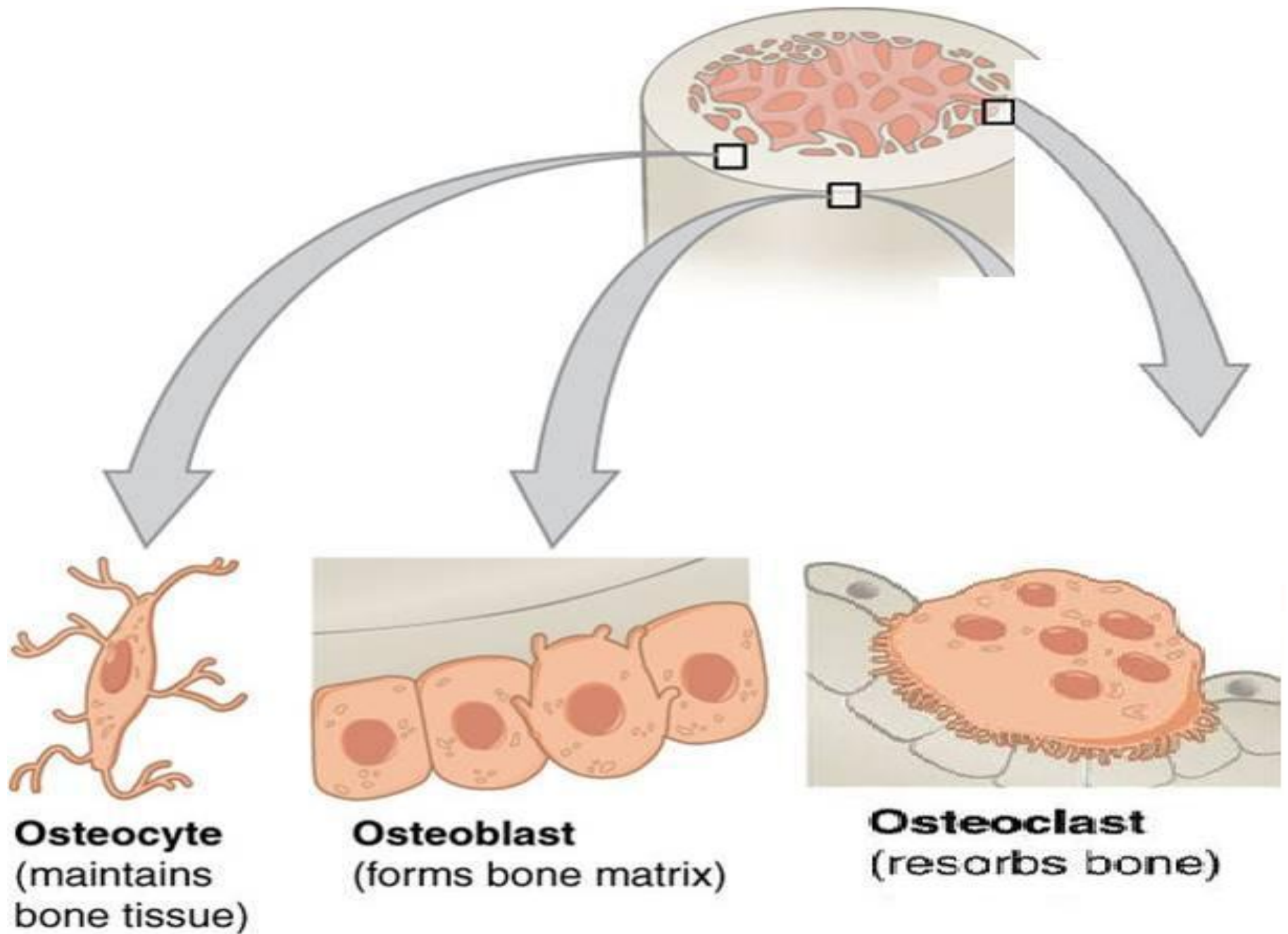


Formation of a bone



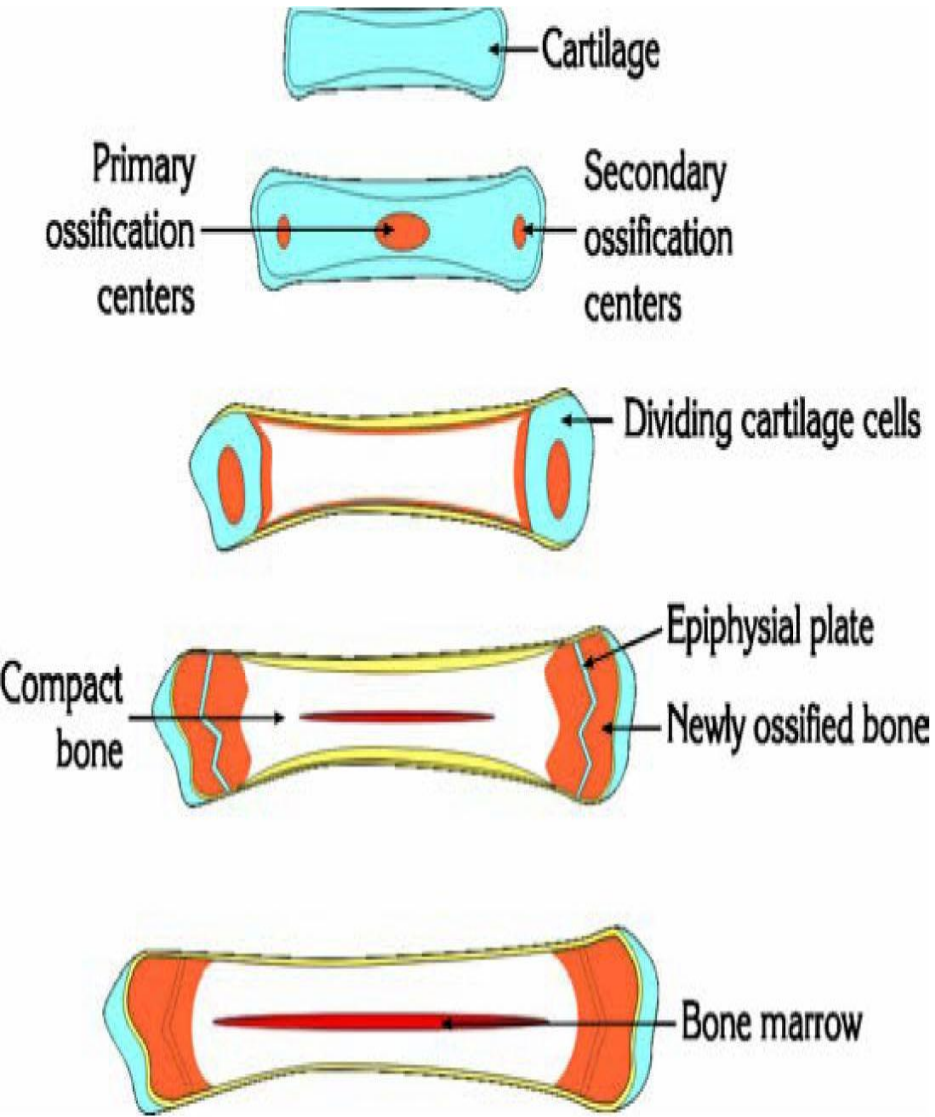
- Bone is formed by **osteoblasts** and cartilage
- Cartilage catch calcium from blood and are converted to **osteocytes**
- In the formation of bone, vitamins A, C, D and Ca and P minerals play important role
- **Osteoclasts** are the cells responsible for bone resorption (поглощение), thus they break down bone



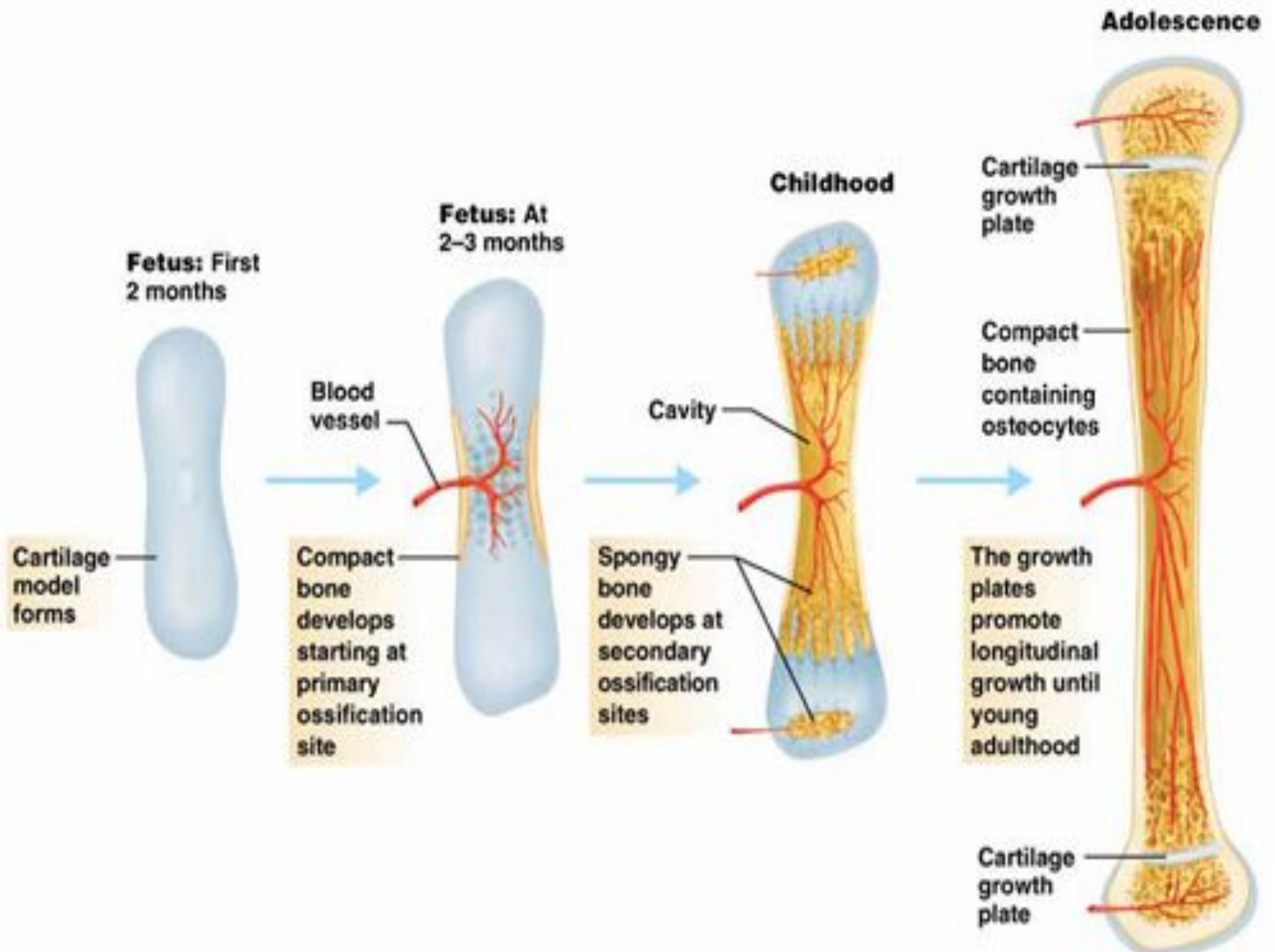




Growth of bones longitudinally



- Bone is formed from cartilage
- Cartilage changes into bone, this process is called ossification
- Cartilage cells (chondrocytes) found in epiphysial plate are responsible for increasing of bone in length

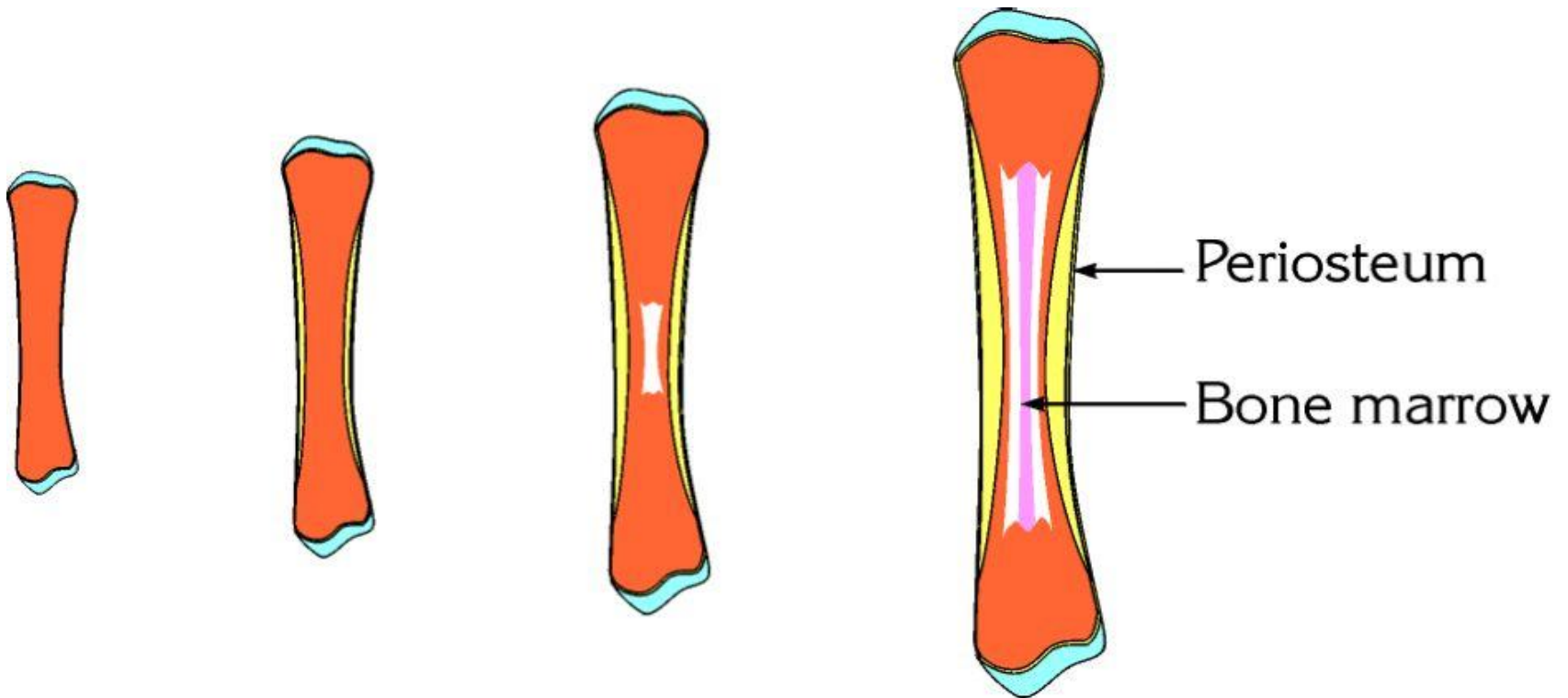




Growth of bones in diameter



- Increasing in diameter is provided by periosteum

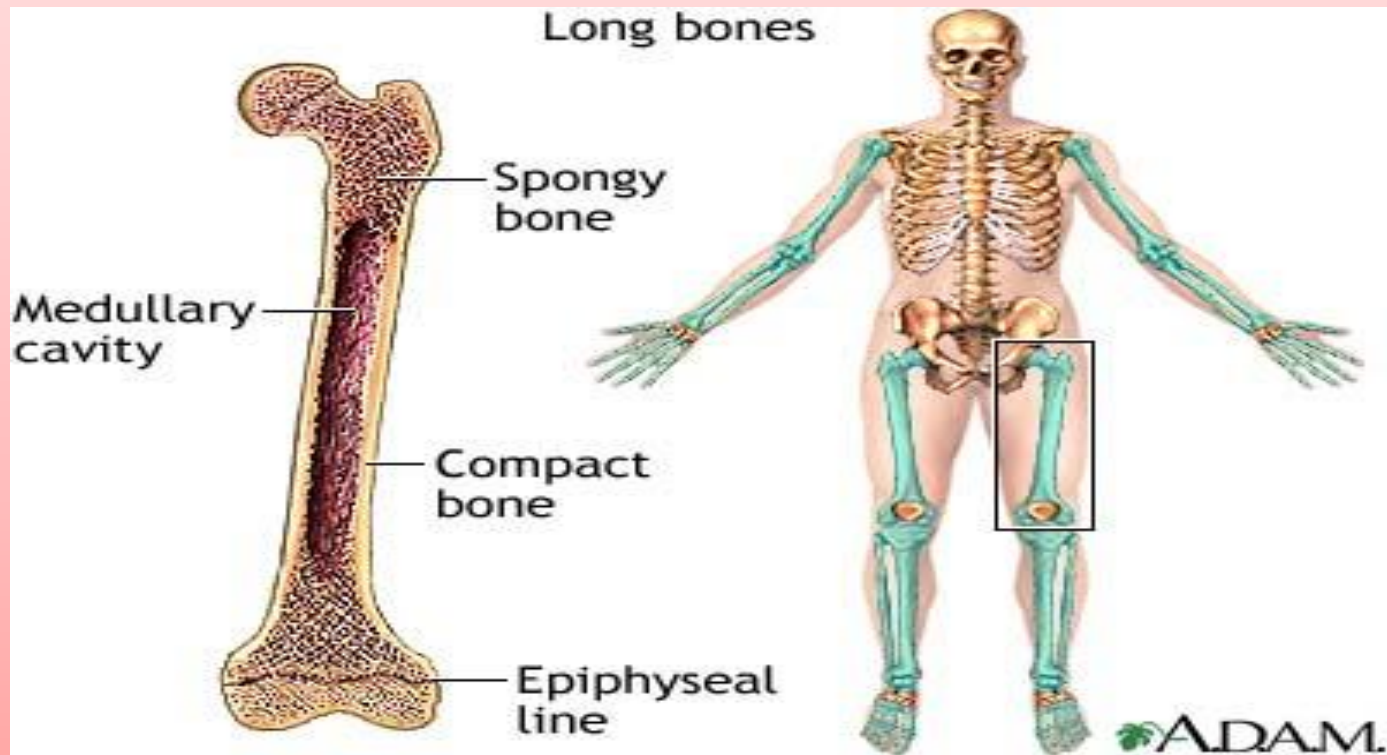




Types of bones



Long Bones: are found in leg and arms

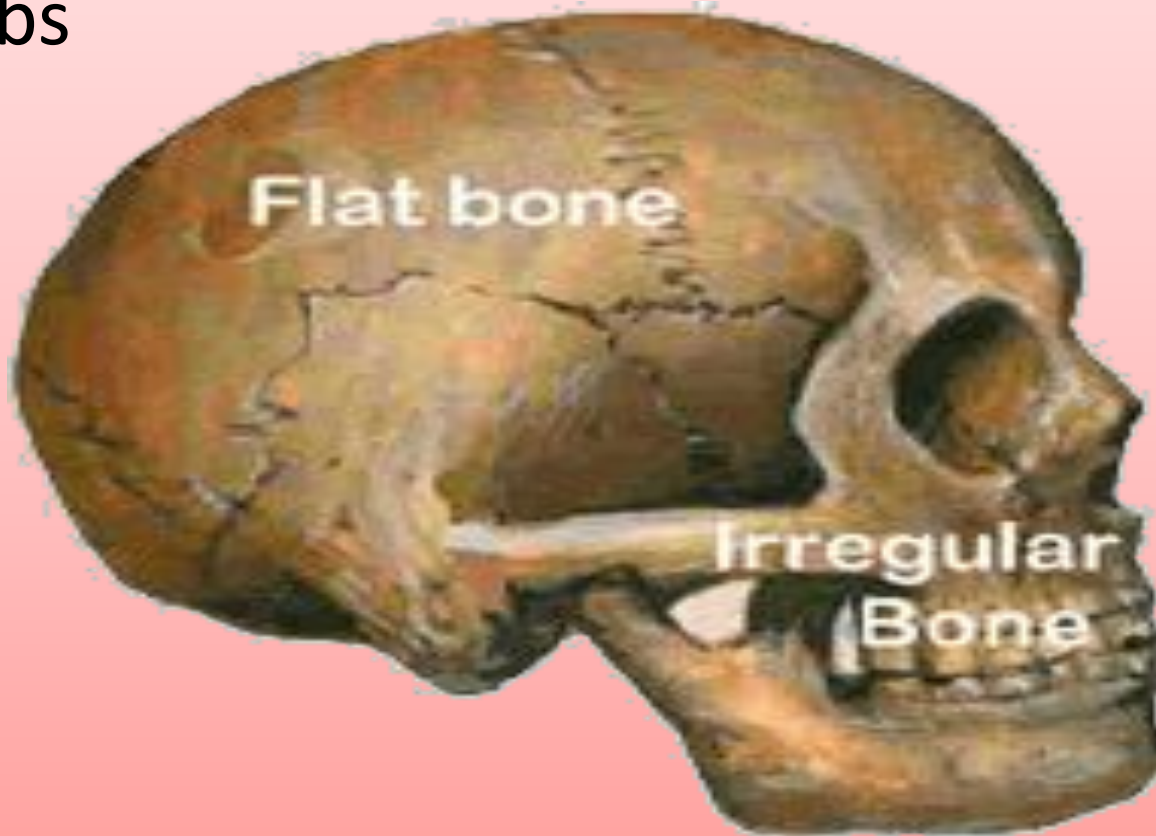




Types of bones



Flat Bones: skull, sternum, patella of knee and ribs





Types of bones

Short Bones: Vertebrae, bones of the hand and foot, fingers

