ҚР ДЕНСАУЛЫҚ САҚТАУ МИНИСТРЛІГІ

С.Д.АСФЕНДИЯРОВ АТЫНДАҒЫ

ҚАЗАҚ ҰЛТТЫҚ МЕДИЦИНА УНИВЕРСИТЕТІ

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РК

КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ МЕДИЦИНСКИЙ

УНИВЕРСИТЕТ ИМЕНИ С.Д.АСФЕНДИЯРОВА

Independent work of students of English

# The skeleton

Prepared by:,
09-022 OM
Checked by: Totanova Nazgul

Almaty
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# Skeletal System - Functions

- Support & shape to body
- Protection of internal organs
- Movement in union with muscles
- Storage of minerals (calcium, phosphorus) & lipids
- Blood cell production

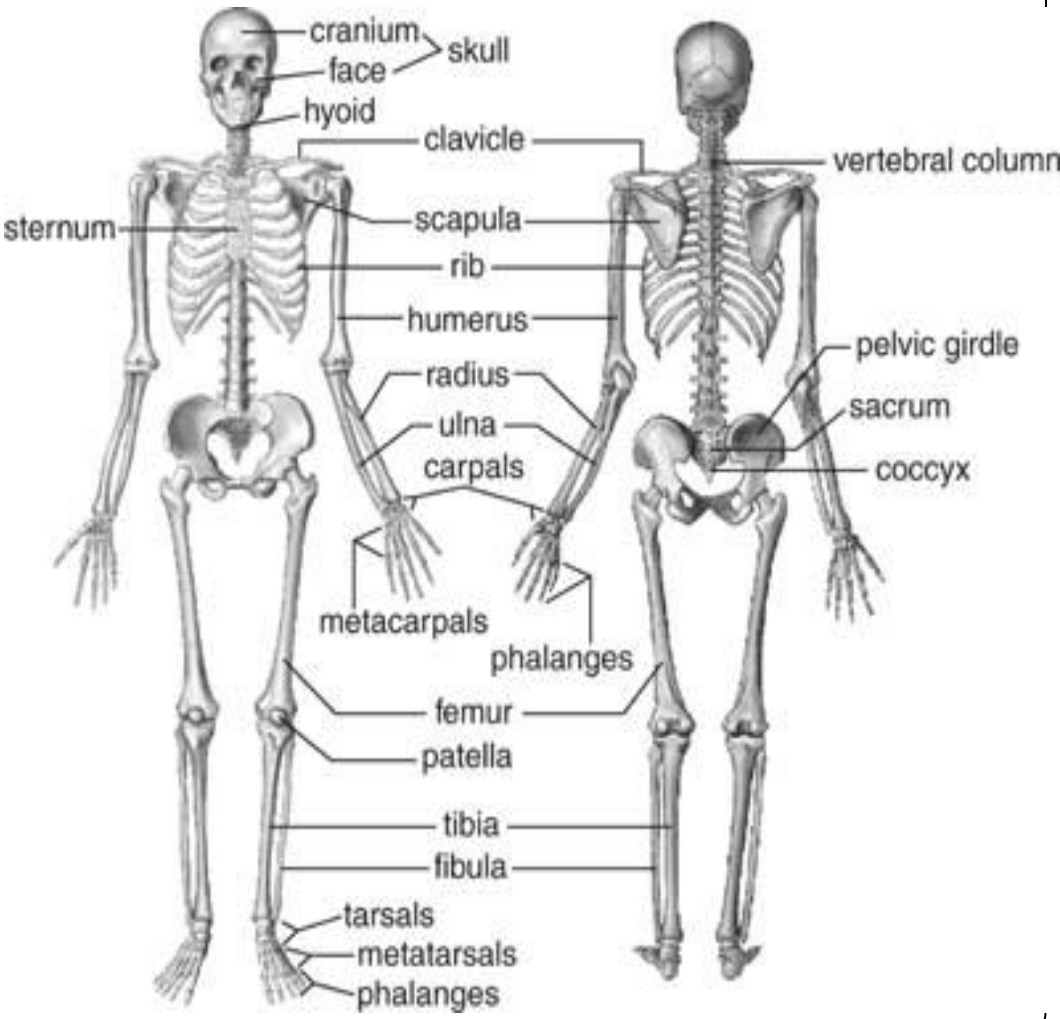
# The Skeletal System

Know the Skeletal Anatomy

- Axial Skeleton
- Appendicular Skeleton
- Surface Anatomy of the bone
  - By x-ray or diagram
- Structure/function of joints, muscle and ligament attachments
  - Including range of motion

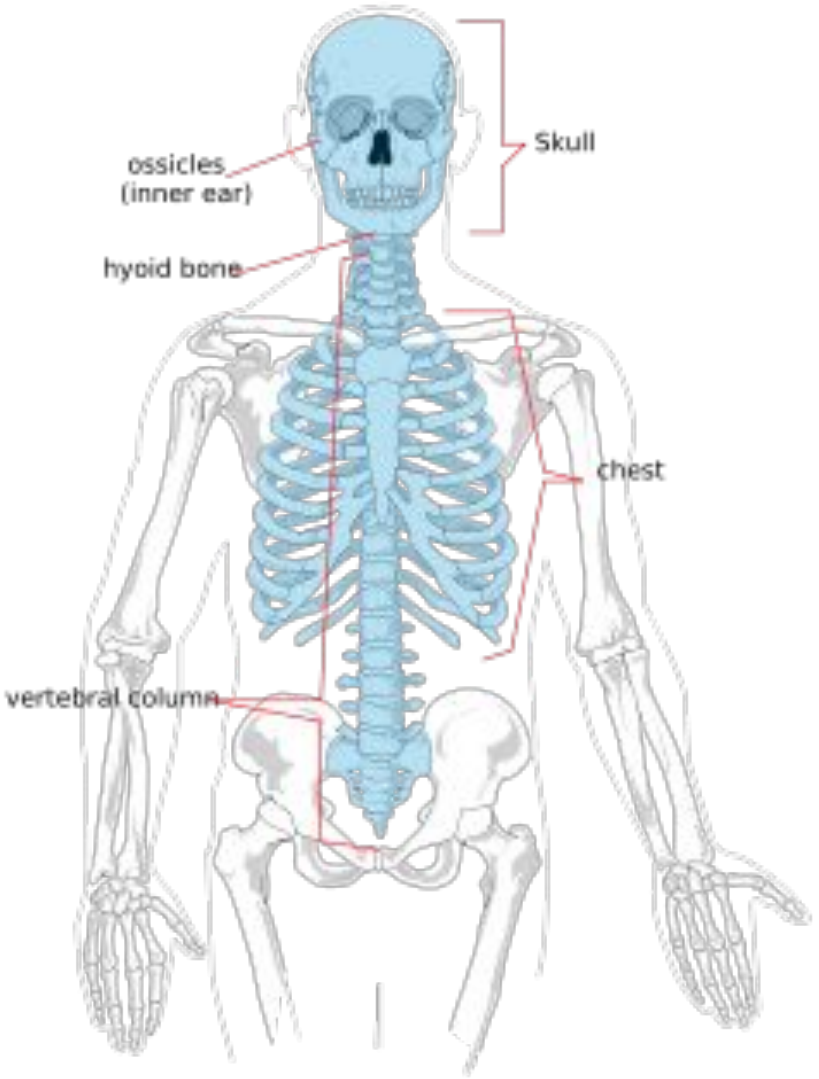
# Human Skeleton

- 206 Bones
- Axial skeleton: (80 bones) in skull, vertebrae, ribs, sternum, hyoid bone
- Appendicular Skeleton: (126 bones)- upper & lower extremities plus two girdles
- Half of bones in hands & feet



# Axial Skeleton (80)

- Skull
- Ossicles of the middle ear
- Hyoid bone
- Thorax or chest
- Vertebral column



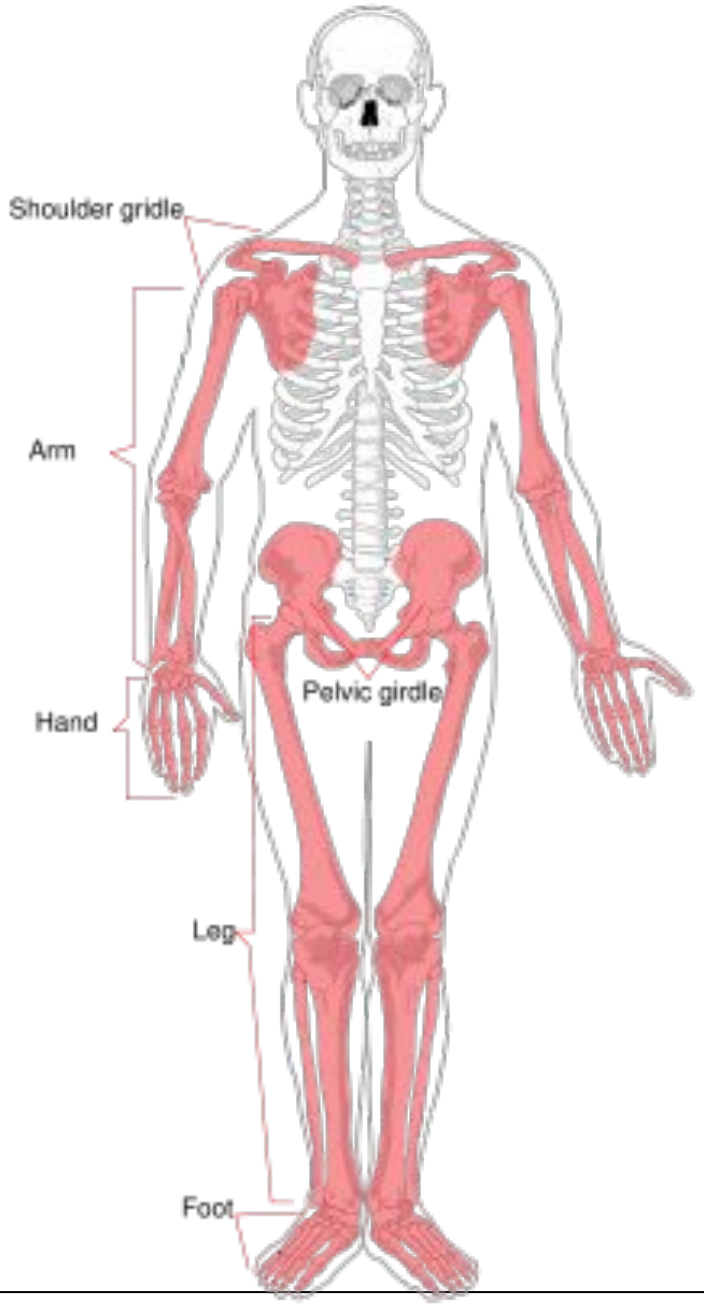
# Appendicular Skeleton (126)

## Upper Extremity (64)

- Shoulder Girdle
- Arms
- Hands

## Lower Extremity (62)

- Pelvic Girdle
- Legs
- Feet



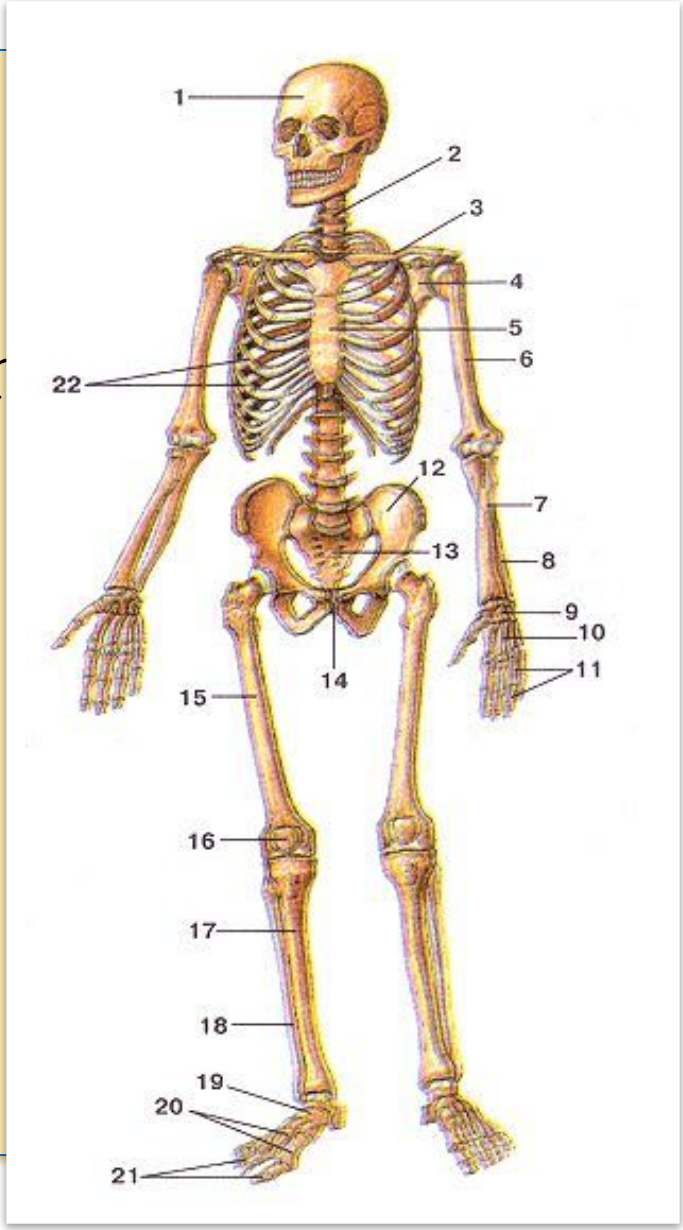
# Types of Bone

- *Long bones:* longer than they are wide; shaft & 2 ends (e.g.: bones of arms & legs,except wrist, ankle & patella)
- *Short bones:* roughly cube-shaped (e.g.: ankle & wrist bones)
- *Sesamoid bones:* short bones within tendons (e.g.: patella)
- *Flat bones:* thin, flat & often curved (e.g.,: sternum, scapulae, ribs & most skullbones)
- *Irregular bones:* odd shapes; don't fit into other classes (e.g.: hip bones & vertebrae)

22 bones in skull
6 in middle ears
1 hyoid bone
26 in vertebral colur
25 in thoracic cage

4 in pectoral girdle
60 in upper limbs
60 in lower limbs
2 in pelvic girdle

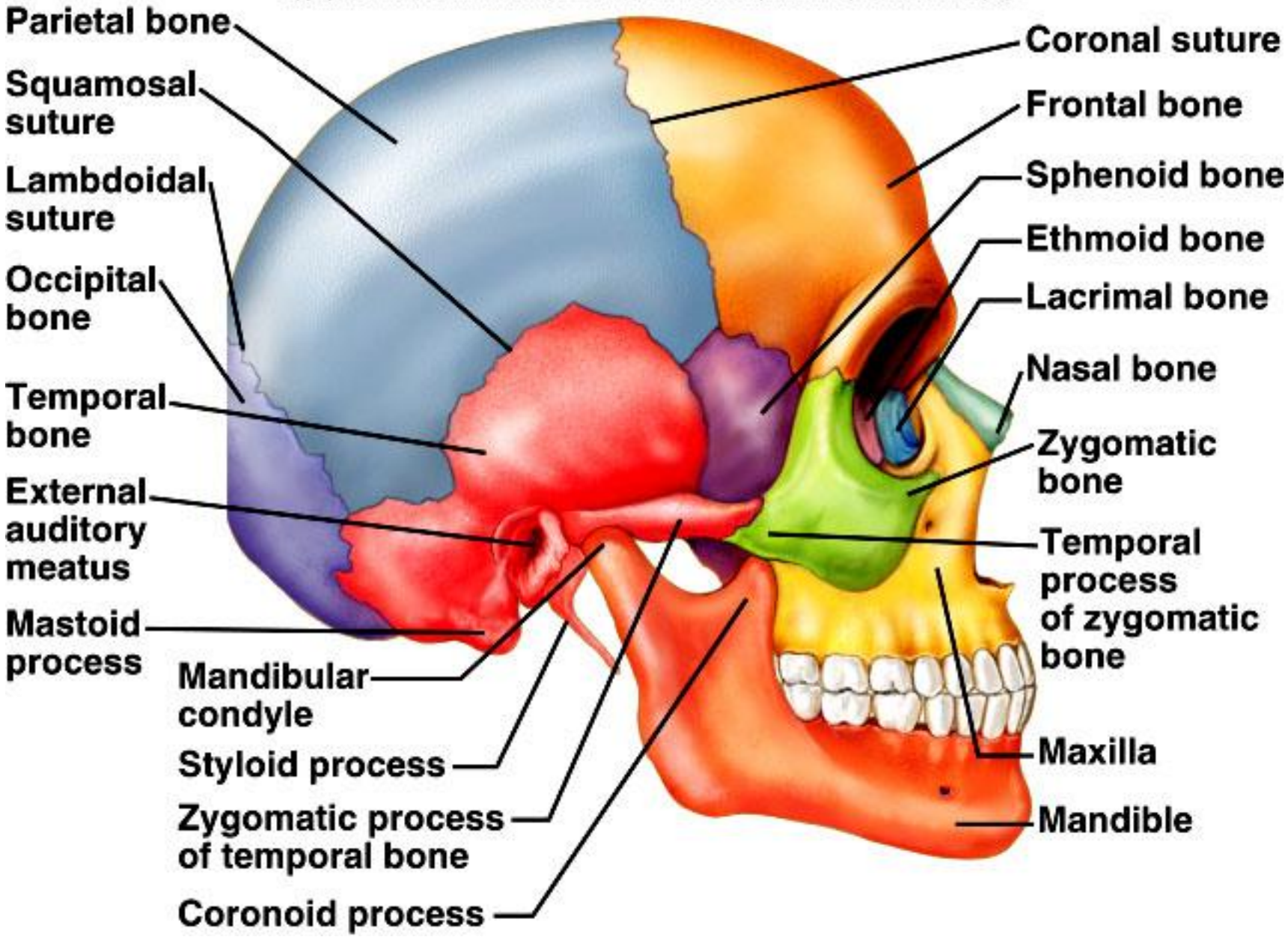
206 bones in all



# The skull

8 sutured bones in cranium
Facial bones: 13 sutured bones,
1 mandible

Cranium
encases brain
attachments for muscles
sinuses

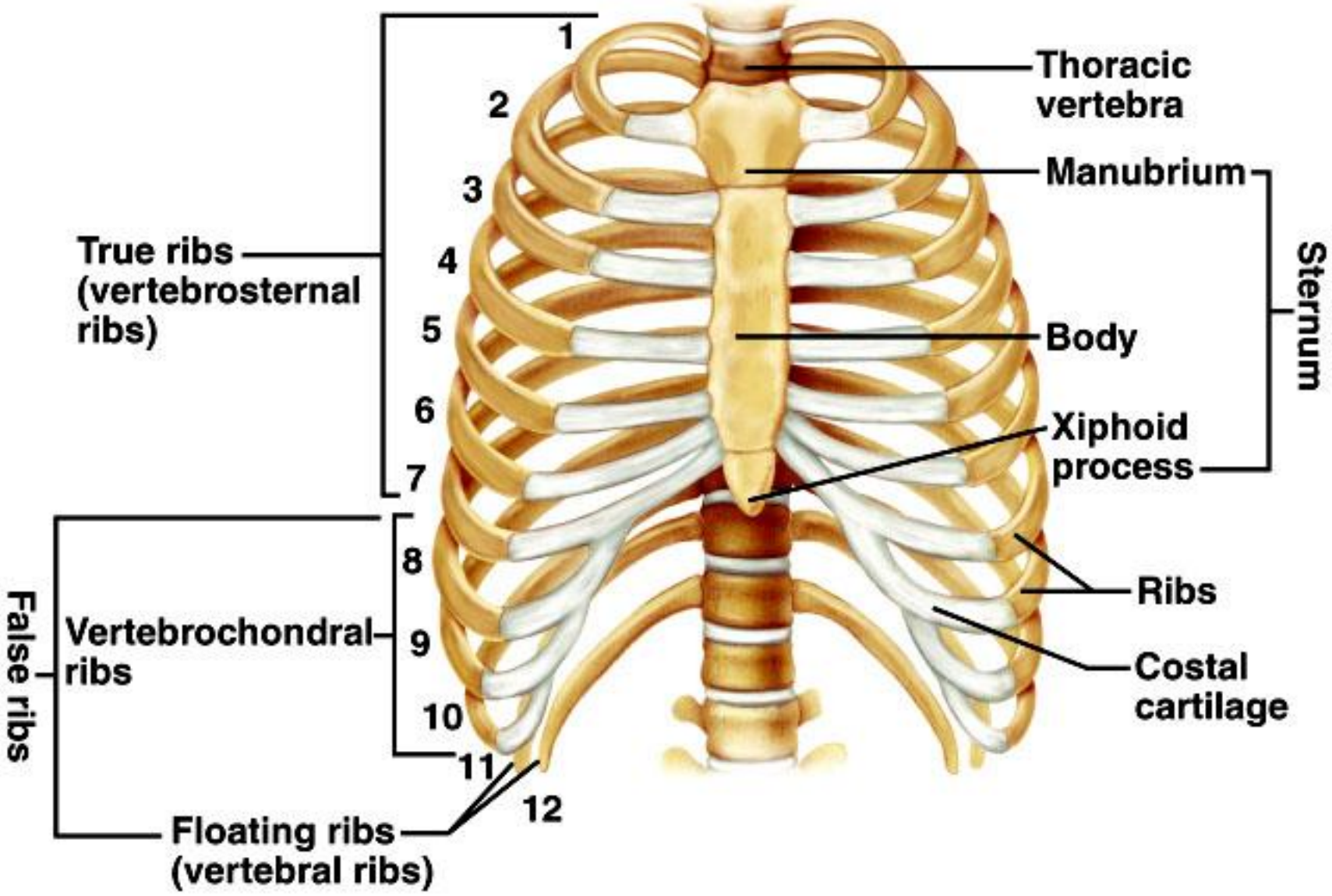


# Thoracic cage

- ✔ ribs
- ✔ thoracic vertebrae
- ✔ sternum
- ✔ costal cartilages

- ❖ True ribs are directly attached to the sternum (first seven pairs)

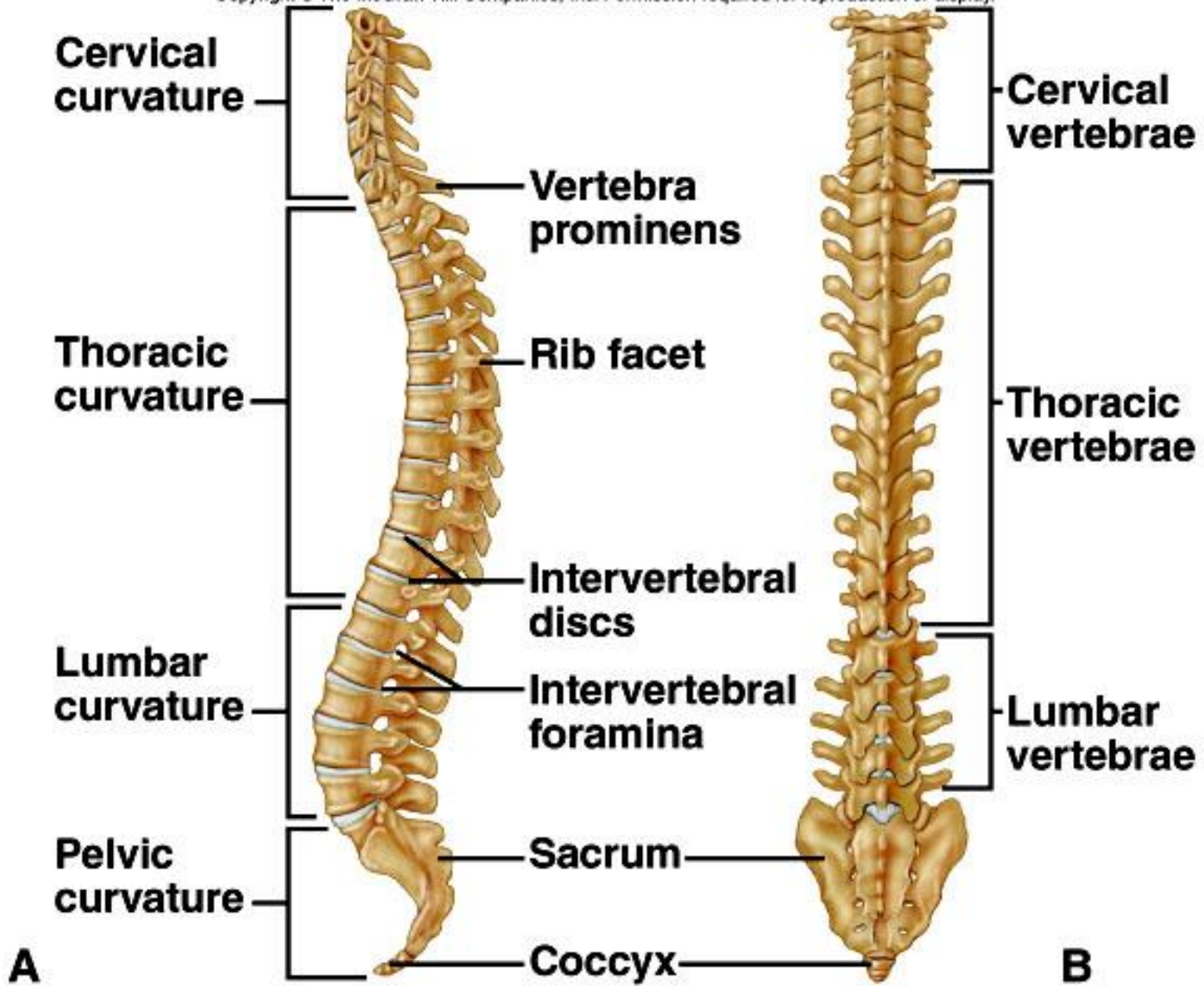
- ❖ Three false ribs are joined to the 7th rib
  Two pairs of floating ribs



# Vertebral column

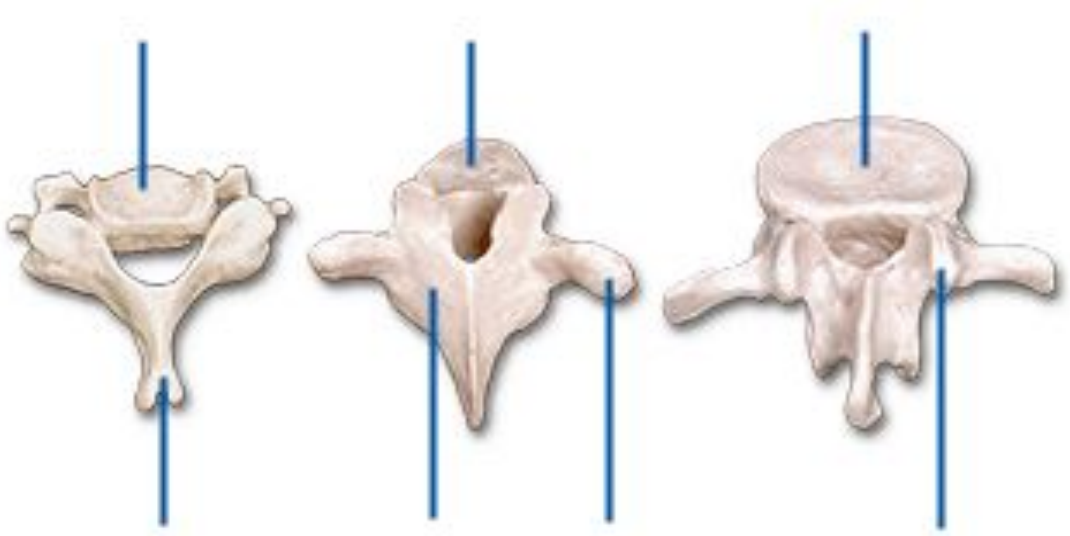
- 7 cervial vertebrae
- 12 thoracic
- 5 lumbar
- 1 sacrum (5 fused)
- 1 coccyx (4 fused)

Vertebrae vary in size and



# Types of Vertebrae

- Cevical (7)
  - Atlas
  - Axis
- Thoracic (12)
- Lumbar (5)



# Cervical Vertebrae

- **Atlas – 1st; supports head**
- **Axis – 2nd; dens pivots to turn head**

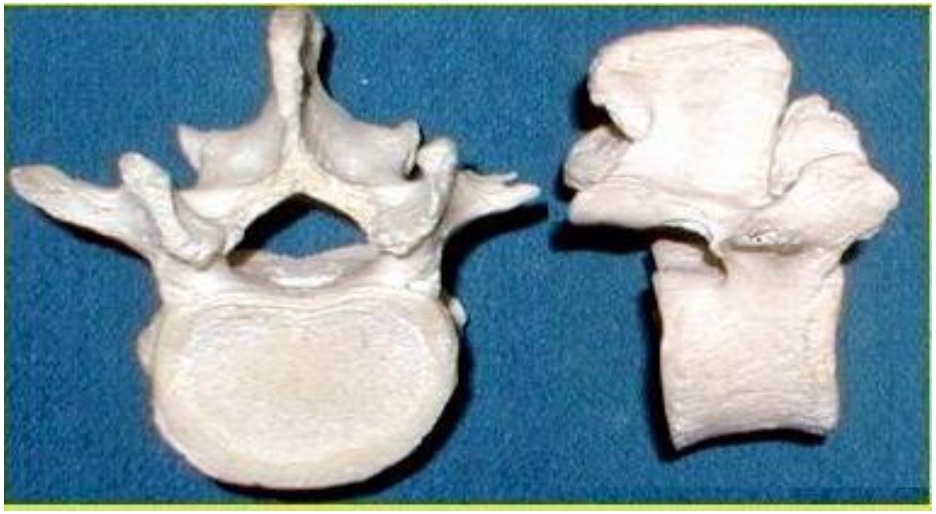
# Thoracic Vertebrae

- **long spinous processes**

- **rib facets**

# Lumbar Vertebrae

- large bodies
- thick, short spinous processes



# Bone Cells

- Osteoblasts – bone forming cells synthesize and secrete unmineralized ground substance and are found in areas of high metabolism within the bone
- Osteocytes – mature bone cells made from osteoblasts that have made bone tissue around themselves. They maintain healthy bone tissue by secreting enzymes and controlling the bone mineral content; they also control the calcium release from the bone tissue to the blood.
- Osteogenic cells respond to traumas, such as fractures, by giving rise to bone-forming cells and bone-destroying cells
- Osteoclasts – bone absorbing cell – large cells that break down bone tissue – important to growth, healing, remodeling
- Bone lining cells - made from osteoblasts along the surface of most bones in an adult. Bone-lining cells

# Types of Skeletal Cartilage

- **Hyaline Cartilages**: fine collagen fiber matrix- most abundant type- found in articular (movable joint) cartilages, costal cartilages (connect ribs tosternum), respiratory cartilages (in larynx & upper respiratory passageways) & nasal cartilages
- **Elastic Cartilages**: similar to hyaline cartilage, more elastic fibers (very flexible) – found in external ear & epiglottis (larynx covering)
- **Fibrocartilage**: rows of chondrocytes with thick collagen fibers; highly compressible with great tensile strength- found in menisci of knee, intervertebral discs & pubic symphysis