

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

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2010

# 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



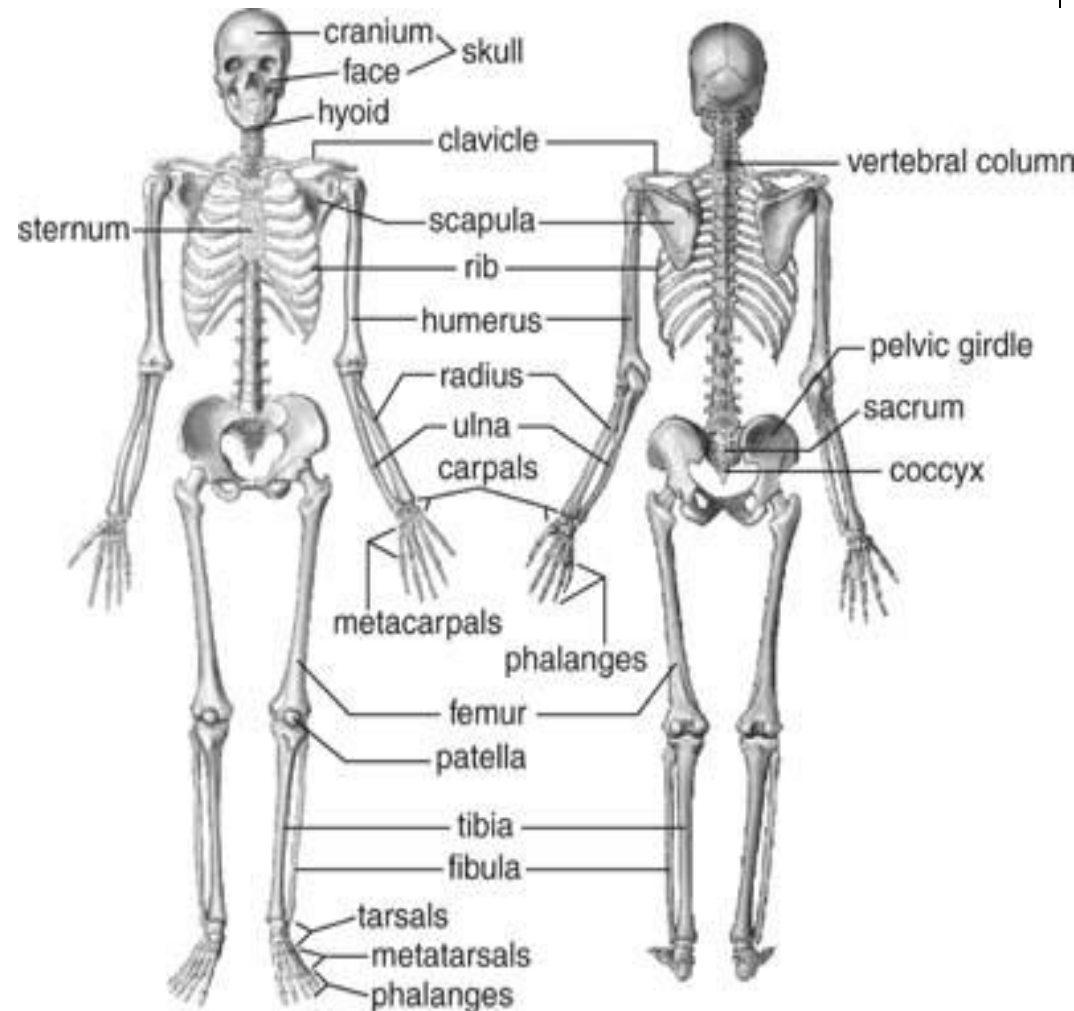
# The Skeletal System

## Know the Skeletal Anatomy

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

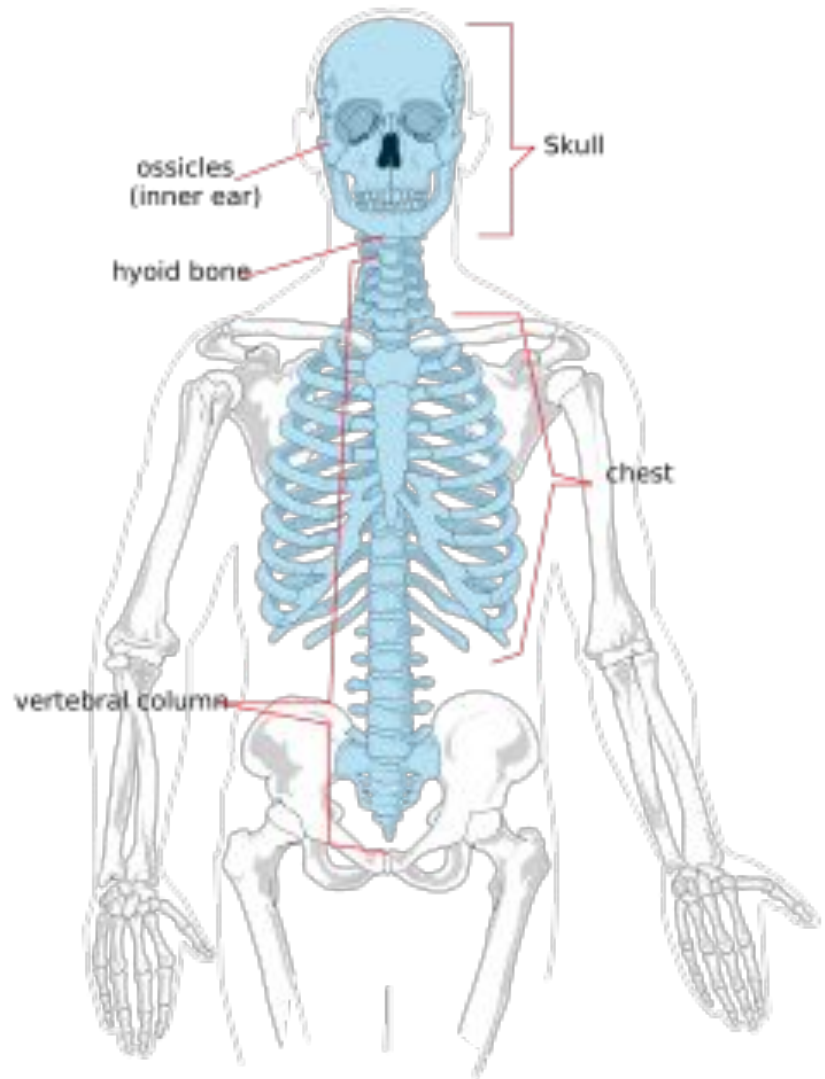
# Human Skeleton

- 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



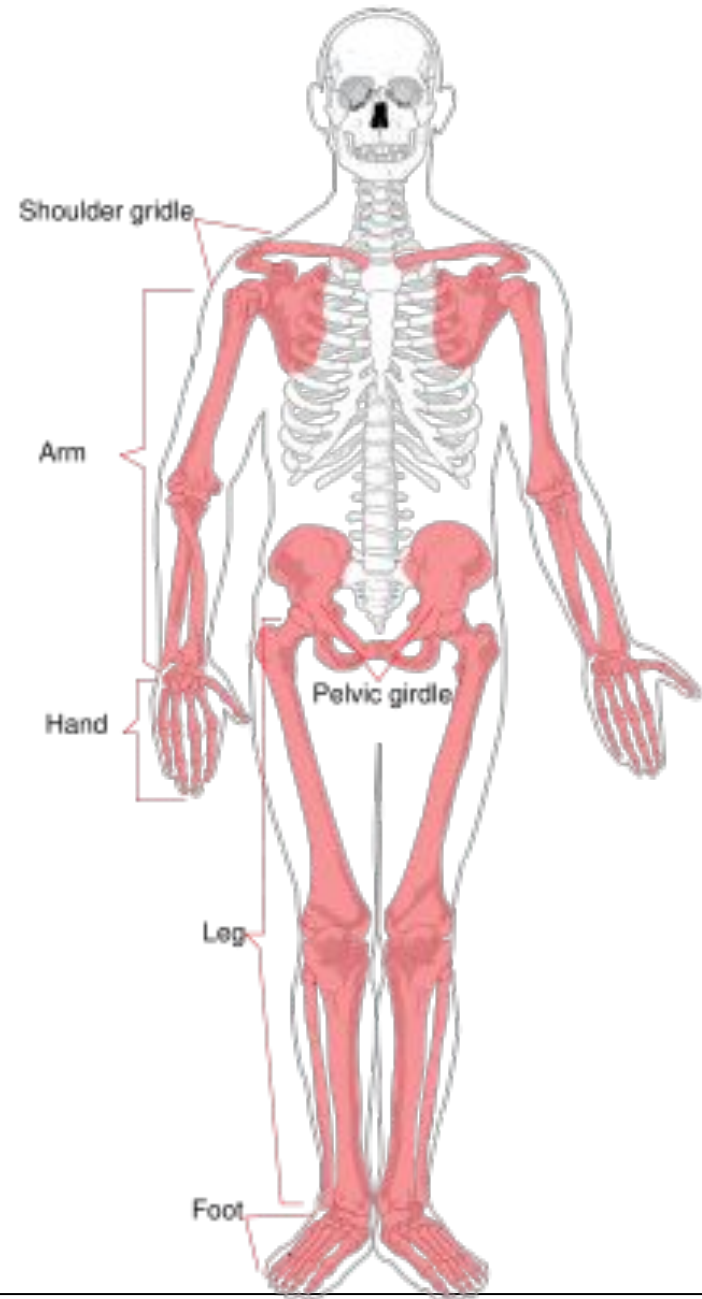
# Appendicular Skeleton (126)

## Upper Extremity (64)

- Shoulder Girdle
- Arms
- Hands

## Lower Extremity (62)

- Pelvic Girdle
- Legs
- Feet



# Types of Bone

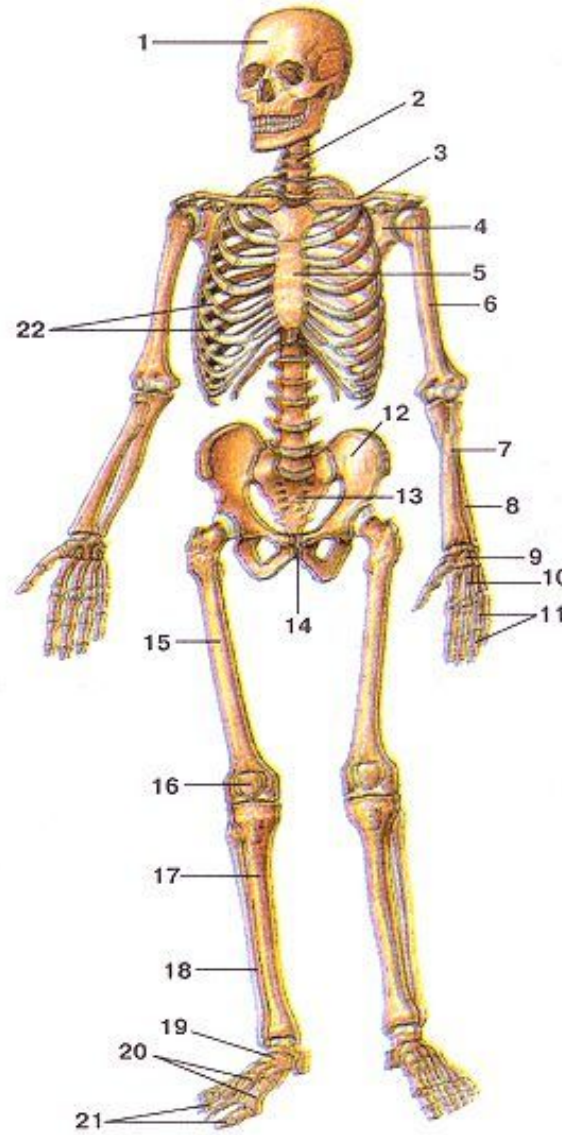
- **Long bones**: longer than they are wide; shaft & 2 ends (e.g.: bones of arms & legs, except wrist, ankle & patella)
- **Short bones**: roughly cube-shaped (e.g.: ankle & wrist bones)
- **Sesamoid bones**: short bones within tendons (e.g.: patella)
- **Flat bones**: thin, flat & often curved (e.g.: sternum, scapulae, ribs & most skull bones)
- **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 column  
25 in thoracic cage

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

206 bones in all





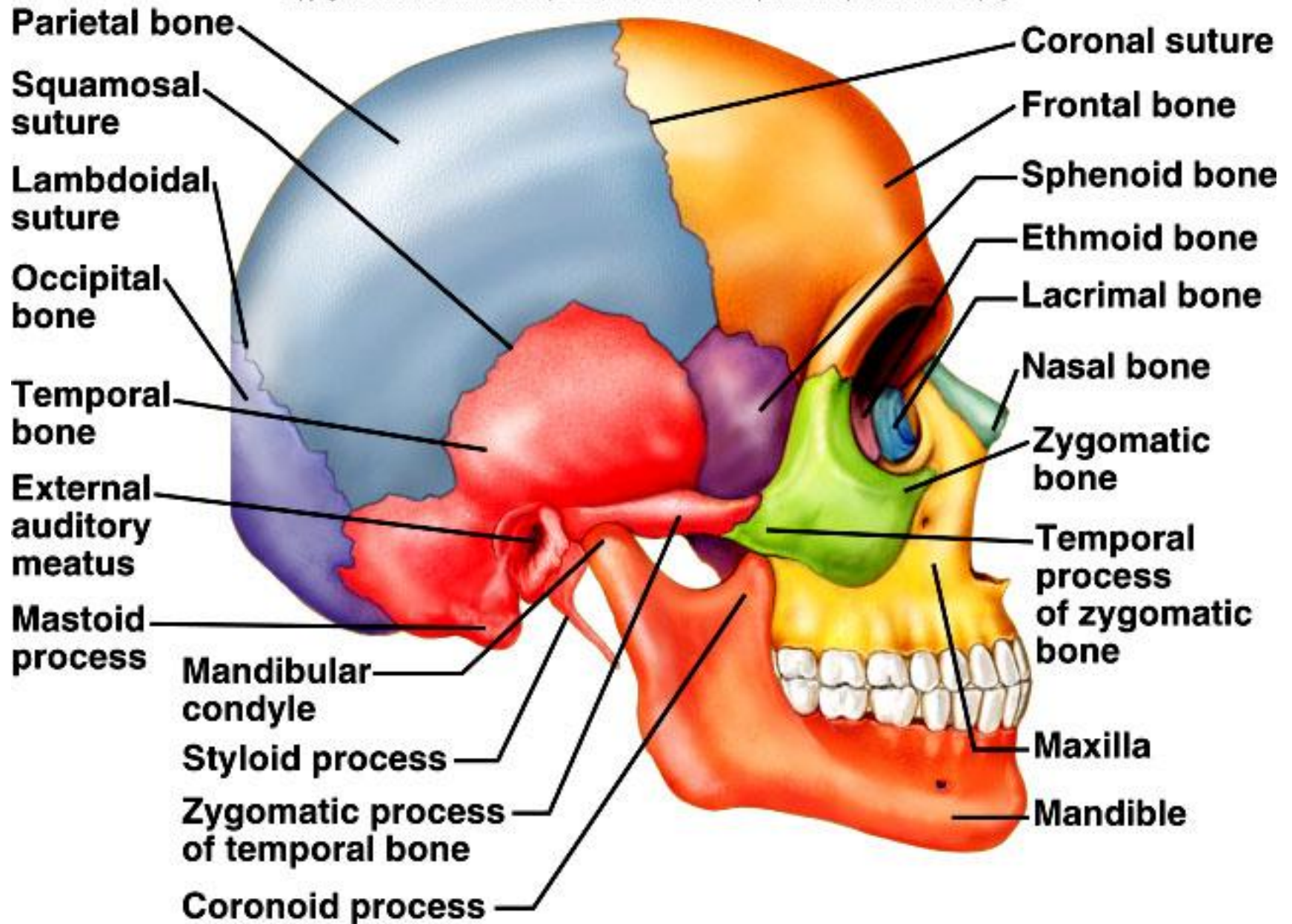
# The skull



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

Cranium  
encases brain  
attachments for muscles  
sinuses

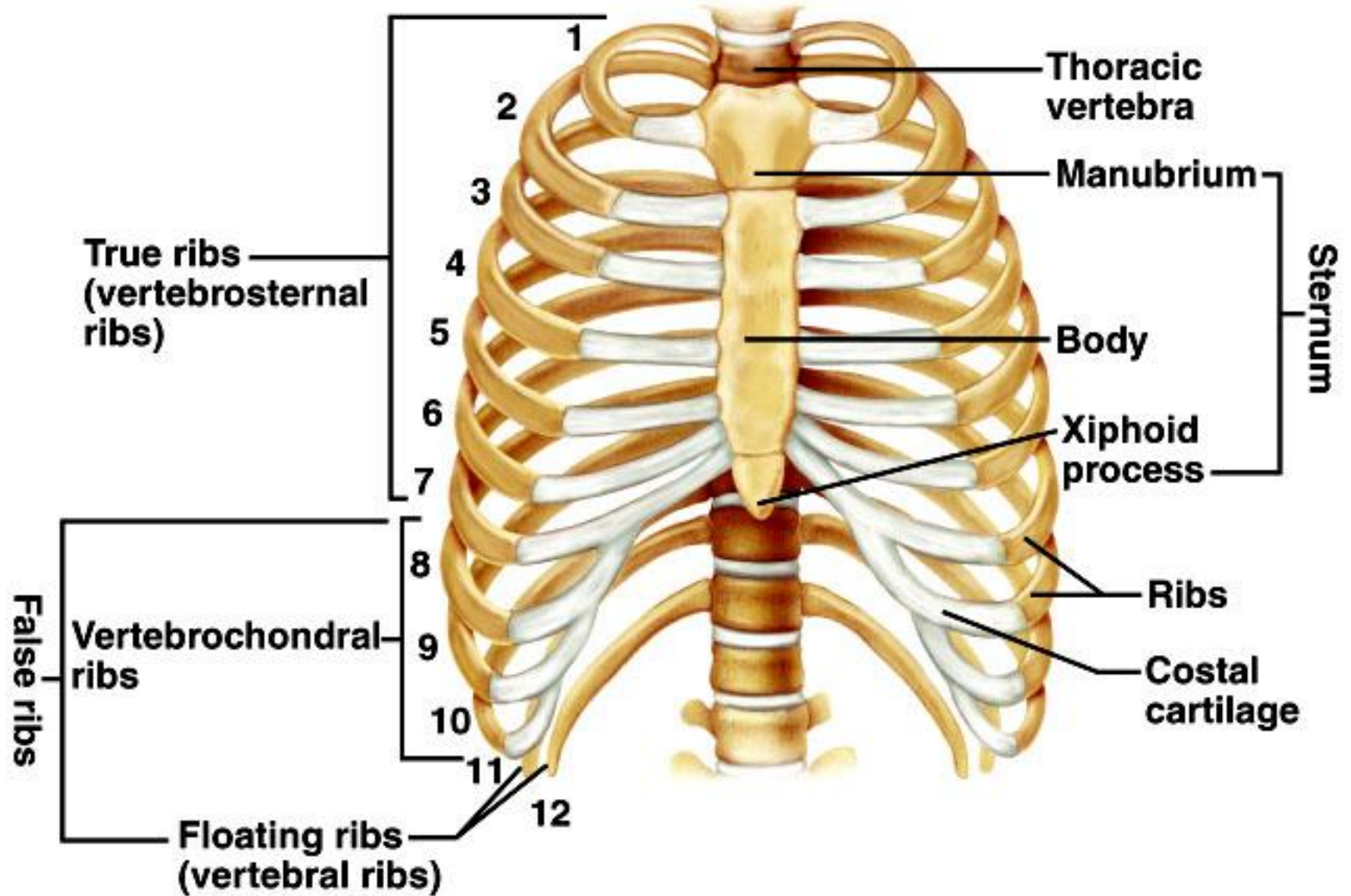




# Thoracic cage

- ✓ ribs
  - ✓ thoracic vertebrae
  - ✓ sternum
  - ✓ costal cartilages
- 
- ❖ True ribs are directly attached to the sternum (first seven pairs)
  - ❖ Three false ribs are joined to the 7<sup>th</sup> rib
  - Two pairs of floating ribs



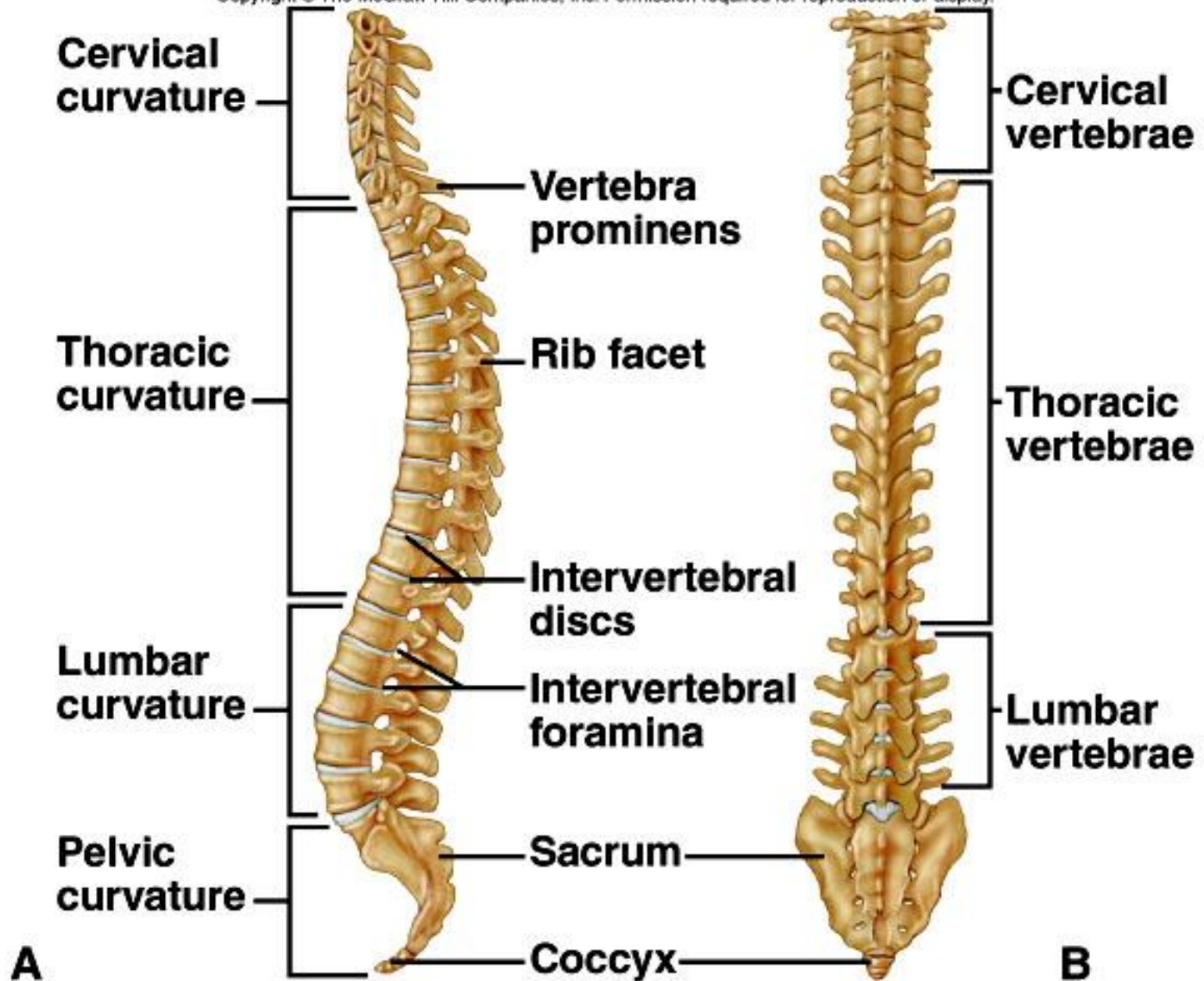




# Vertebral column

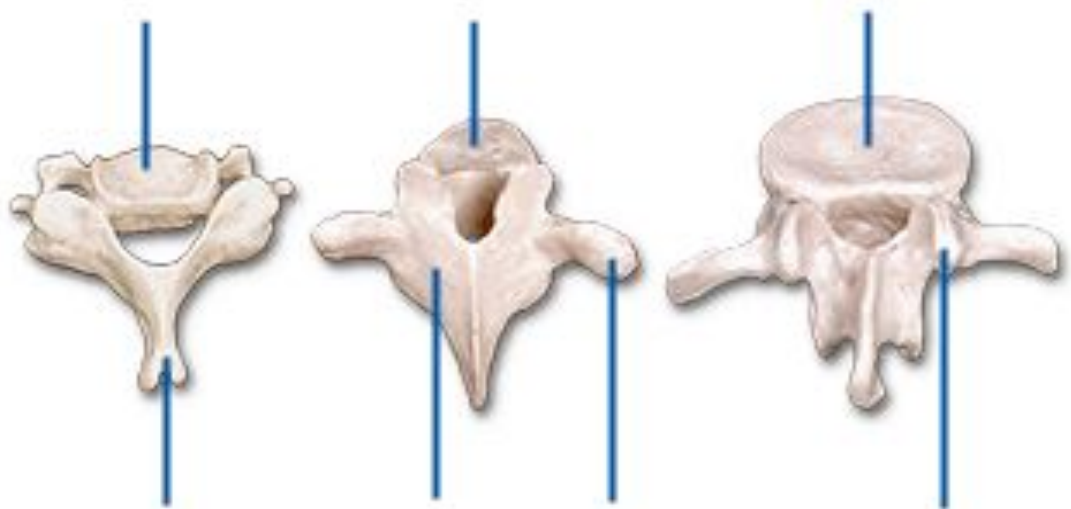
- 7 cervical vertebrae
- 12 thoracic
- 5 lumbar
- 1 sacrum (5 fused)
- 1 coccyx (4 fused)

Vertebrae vary in size and



# Types of Vertebrae

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



# Cervical Vertebrae



- **Atlas** – 1<sup>st</sup>; supports head
- **Axis** – 2<sup>nd</sup>; 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 to sternum), 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