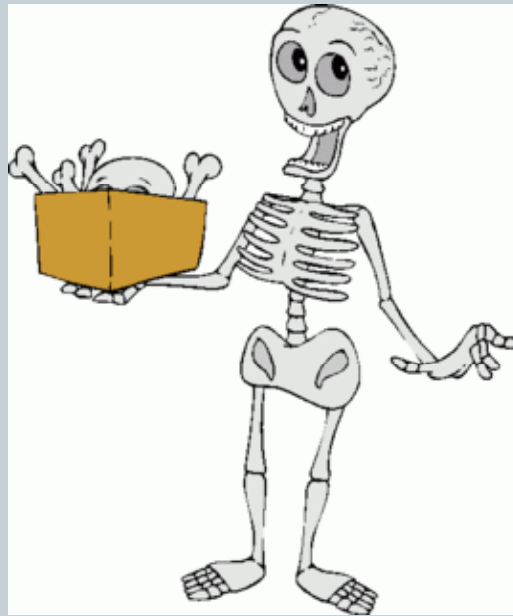
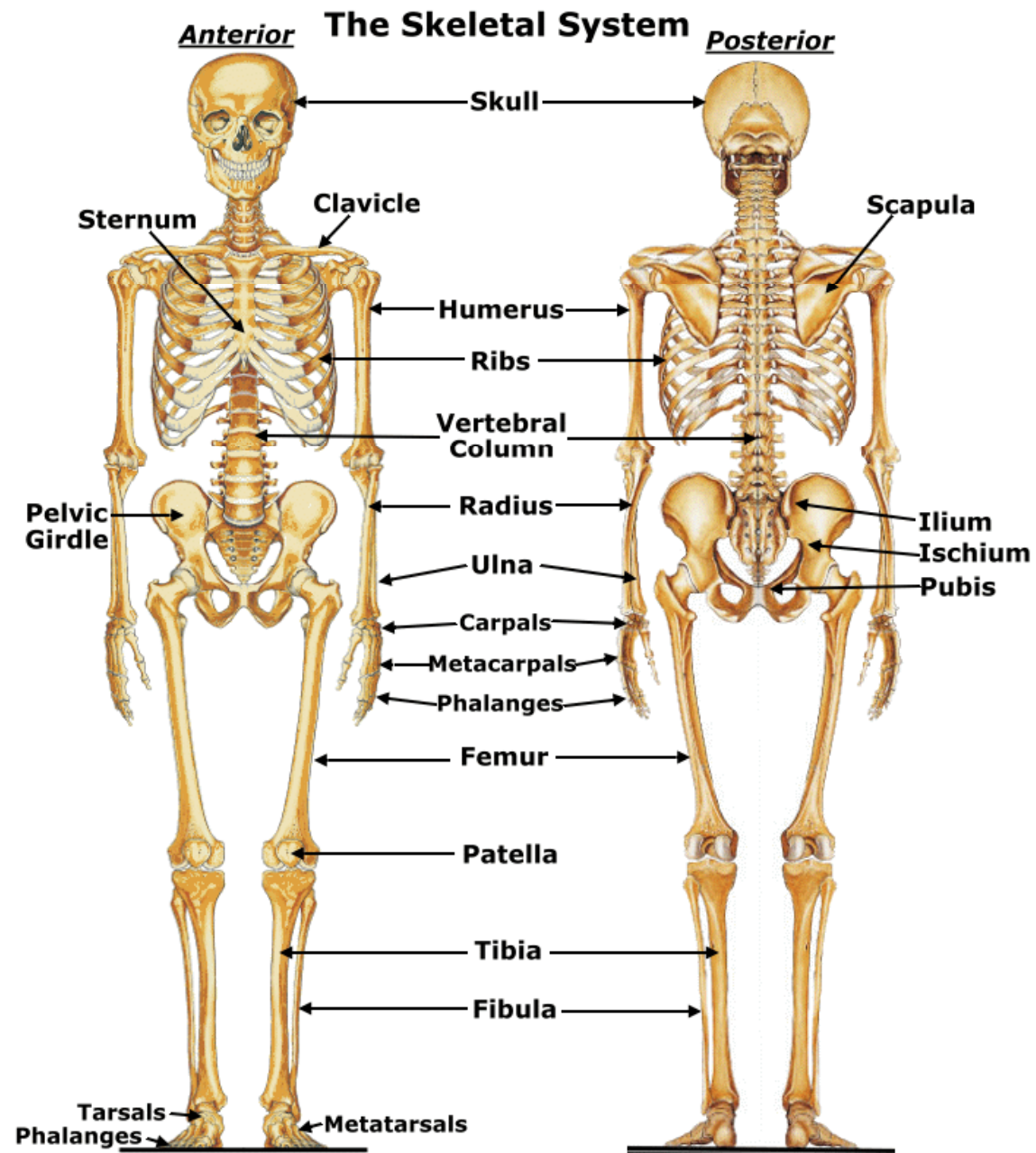


Osteology

1

BONES & CARTILAGES





Function

3

- Body shape
- Special organs protection
- Muscle attachments
- Ca & P elements storage
- Blood cell production



FRAMEWORK SUPPORT

MOVEMENT

PROTECTS

STORAGE

NEW BLOOD CELLS



Bone

5

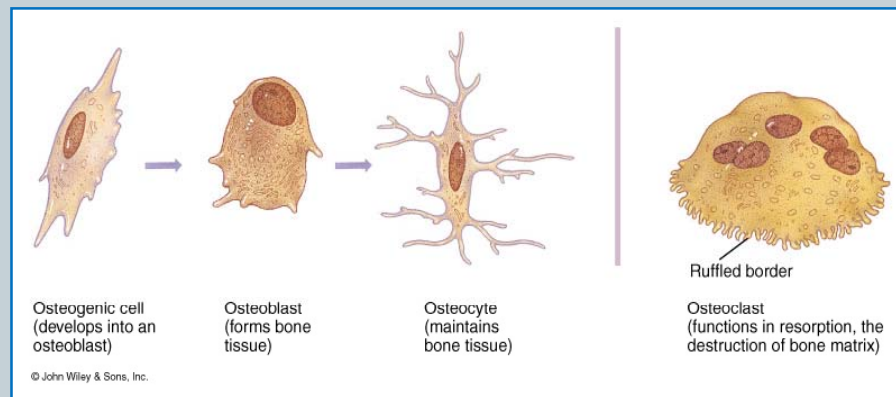
- Mineralized connective tissue

- Cells

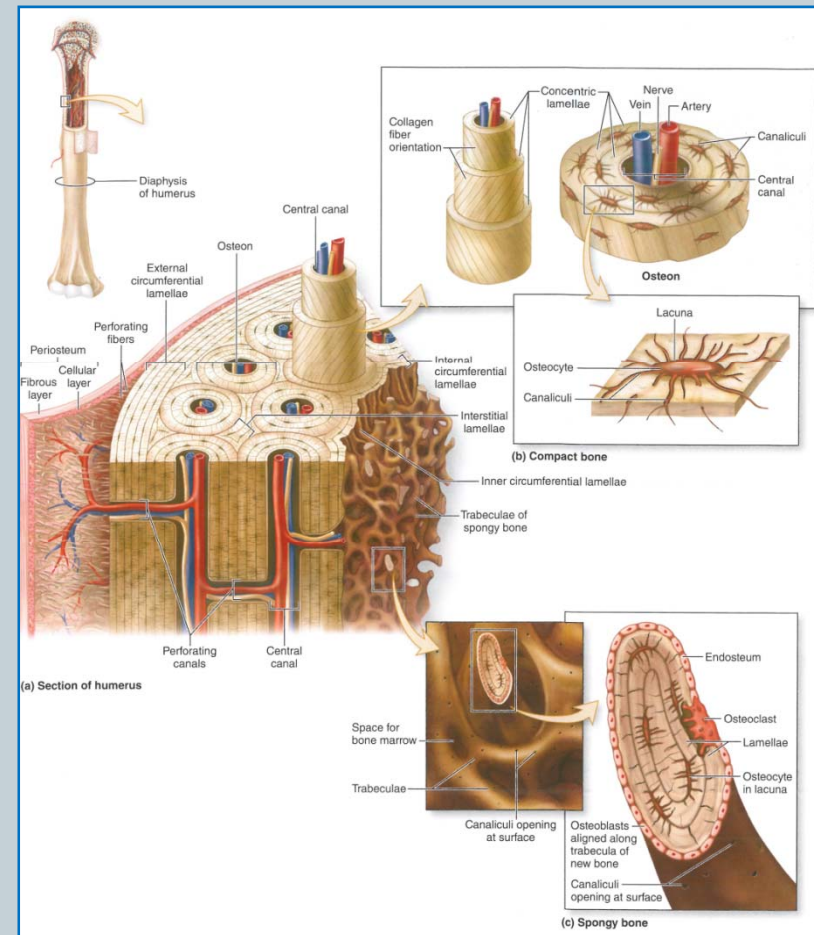
Osteocyte

Osteoblast

Osteoclast



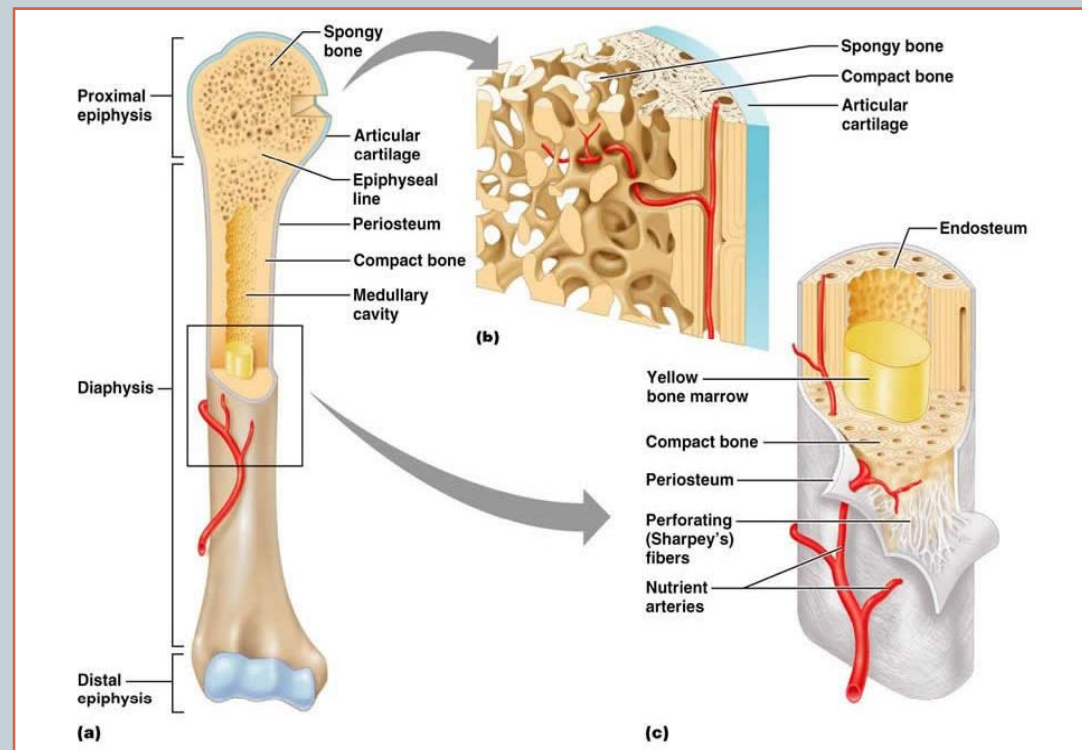
- High regeneration potential



Macroscopic classification

6

1. Compact Bone
 2. Spongy Bone
- **Long bone morphology**



Classification by Growth & development

7

- **Membranous**

Mesenchymal origin

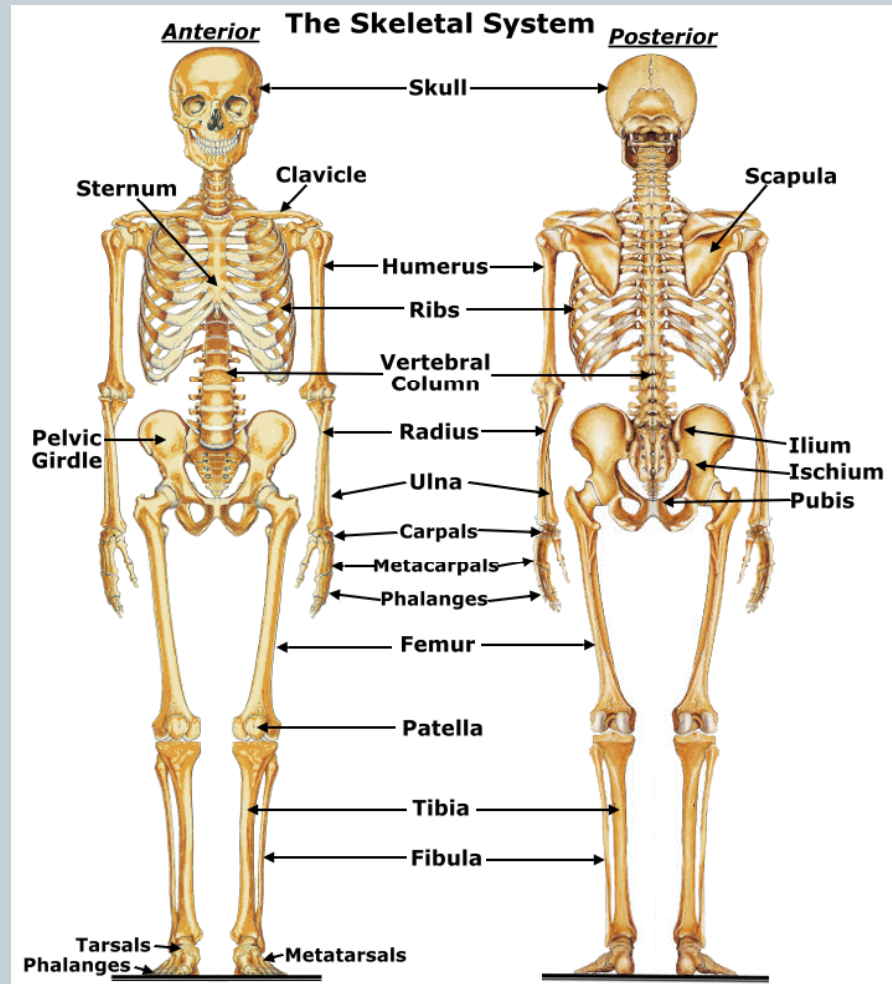
Face & calvaria

- **Cartilaginous**

Limb, vertebrate, ...

- **Membranous- Cartilaginous**

Sphenoid, clavicle, mandible



Classification by position

Axial Skeleton

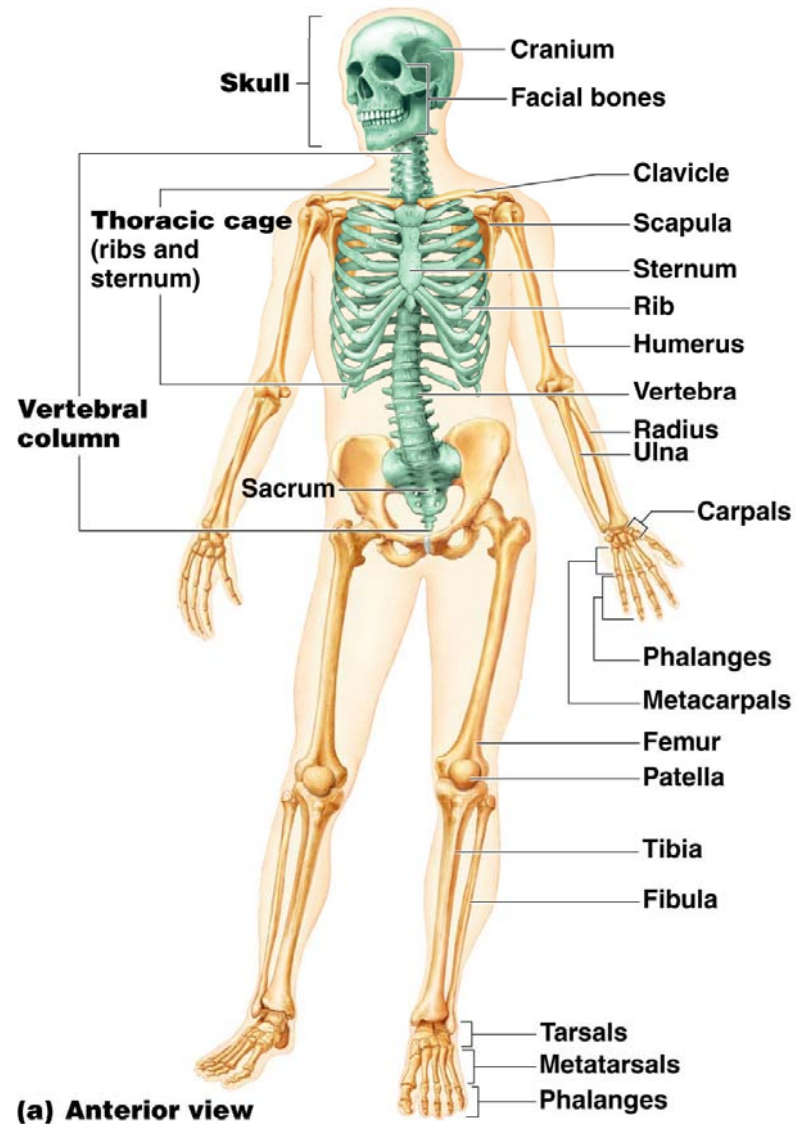
Appendicular



Classification by position

Axial Skeleton

Appendicular

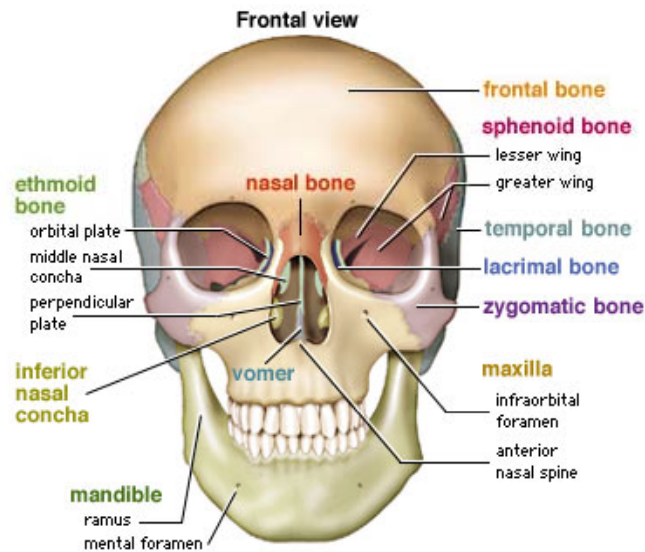


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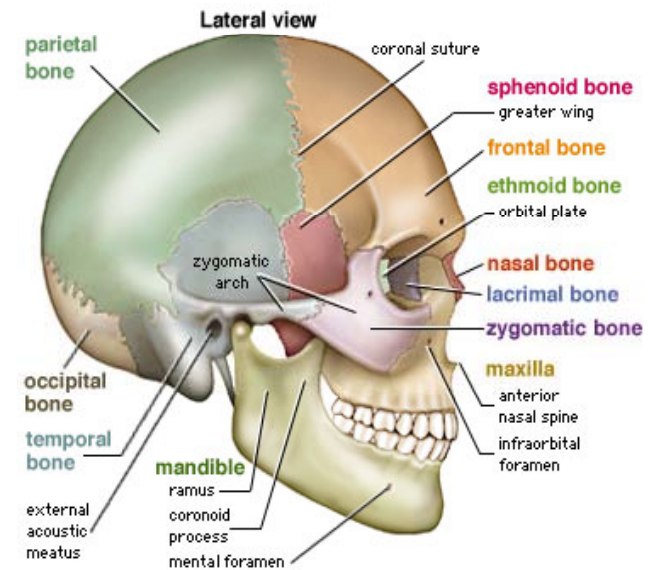
Skull

10

- Brain
- Eye
- Ear
- Olfactory cells



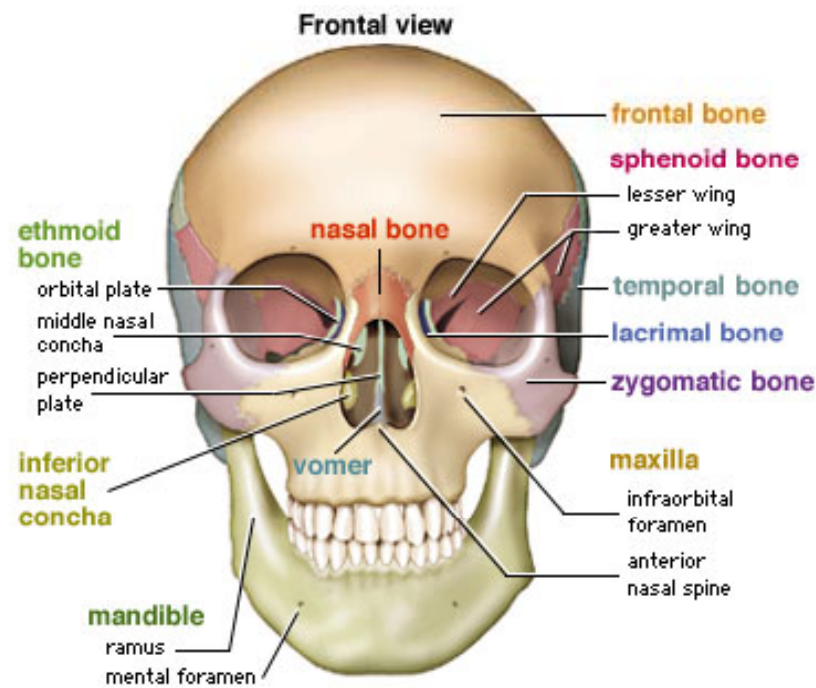
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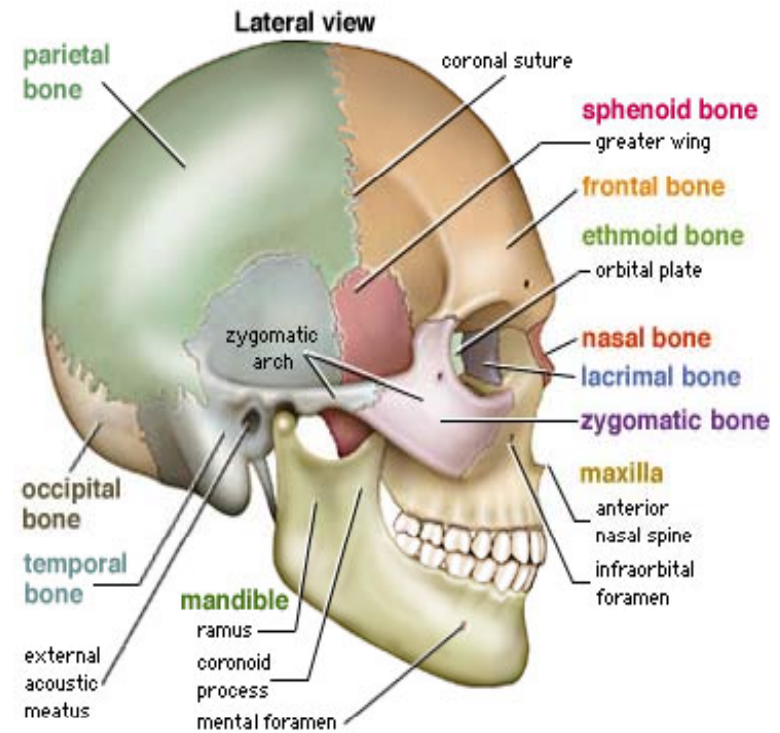
Skull

11

1. Viscero cranium (14 bones)
2. Neuro cranium (8 bones)



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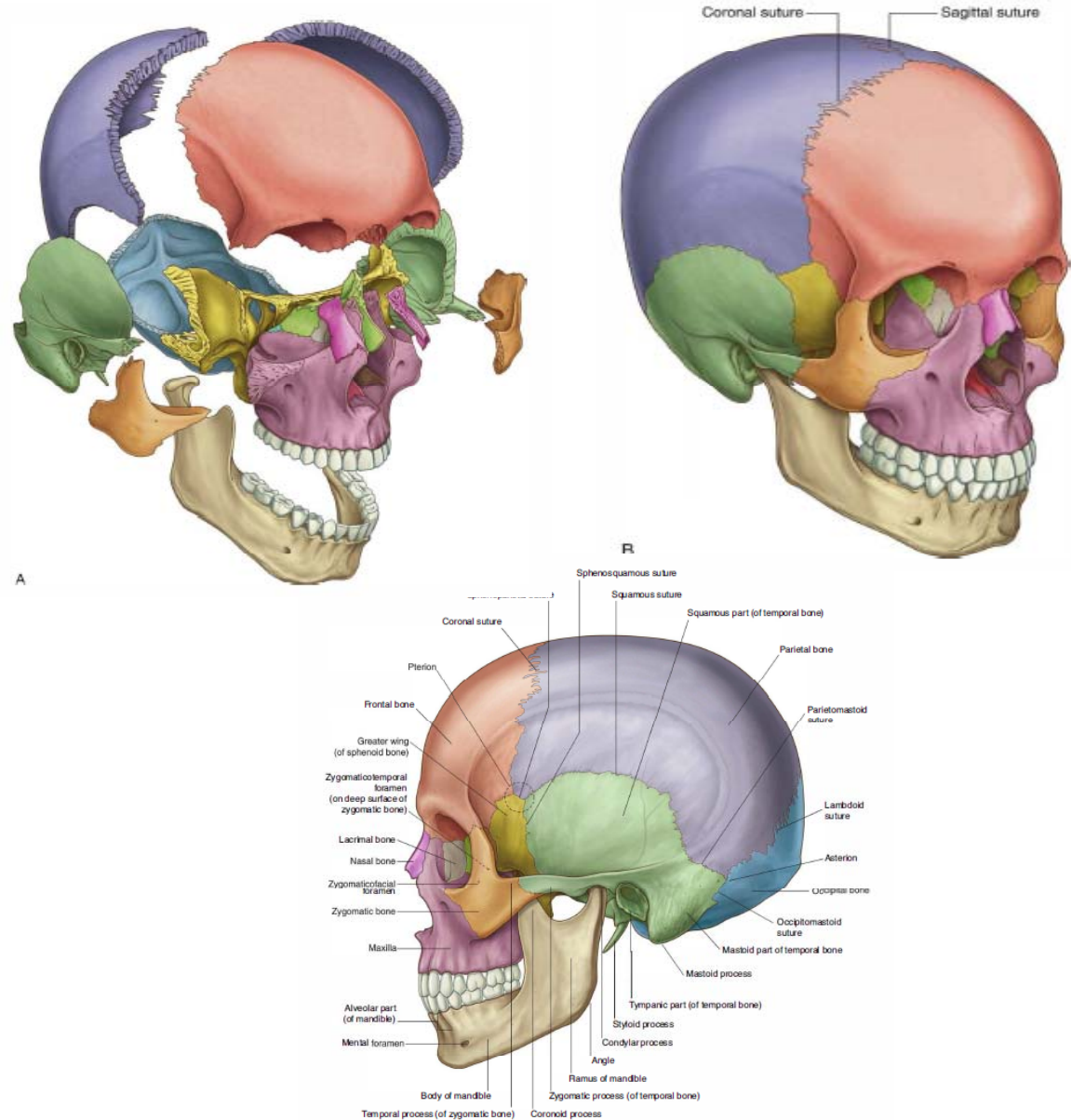
Skull bones

Even bones

- Parietal
- Temporal

Odd bones

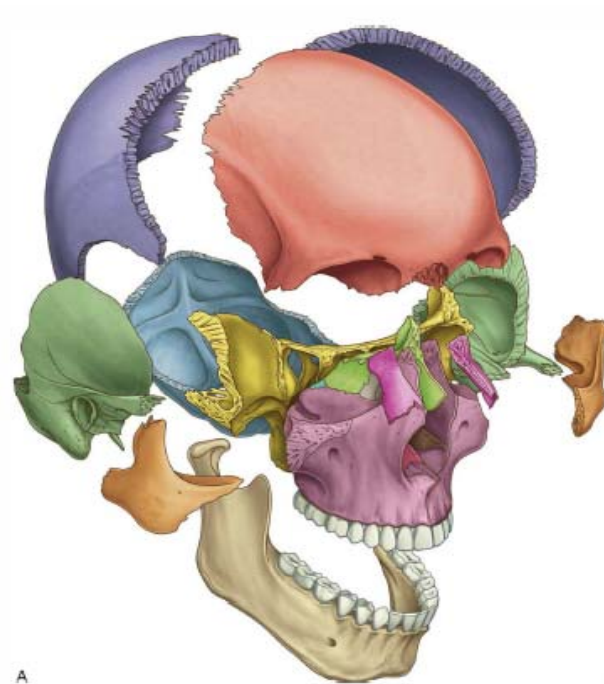
- Frontal
- Occipital
- Sphenoid
- ethmoid



Face even bones

13

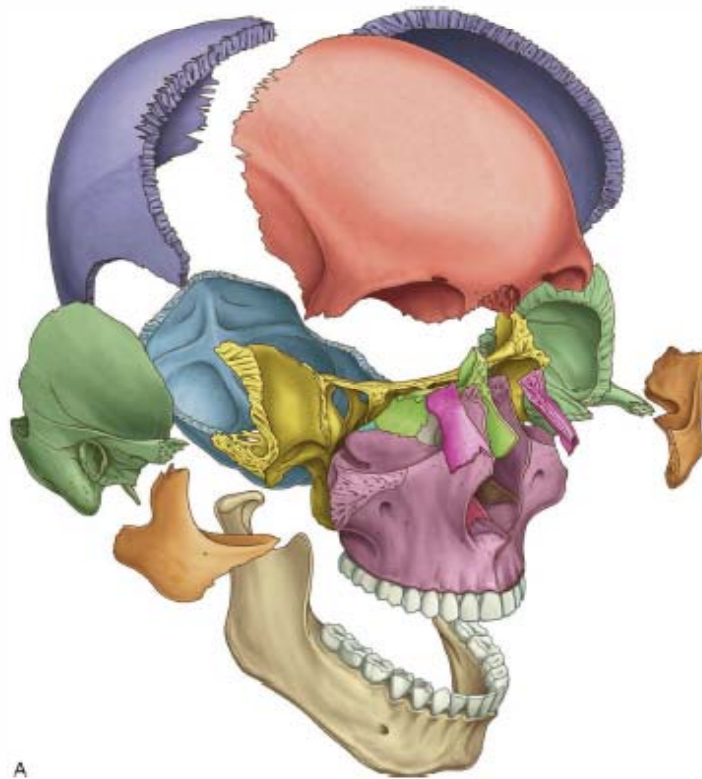
- Maxilla
- Zygomatic
- Nasal
- Palatine
- Lacrimal
- Inferior concha



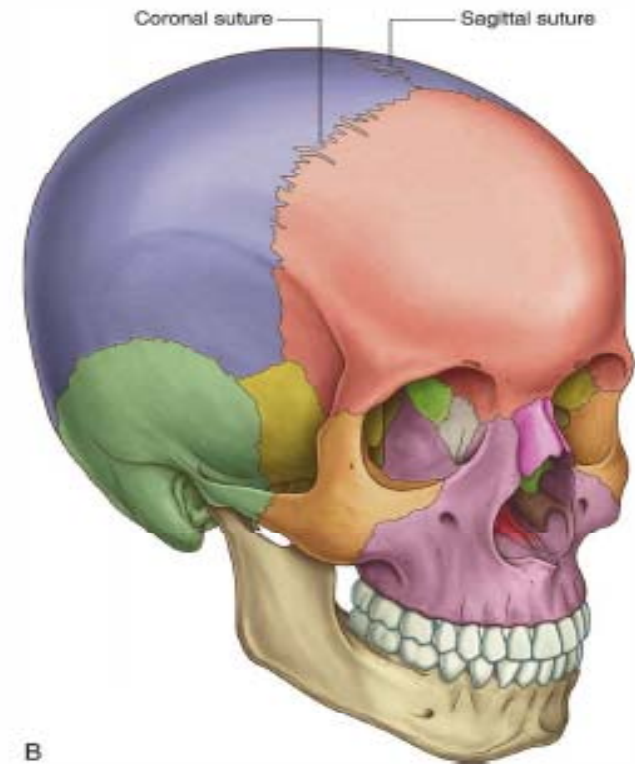
Face odd bones

14

- Mandible
- Vomer



A



B

Frontal bone

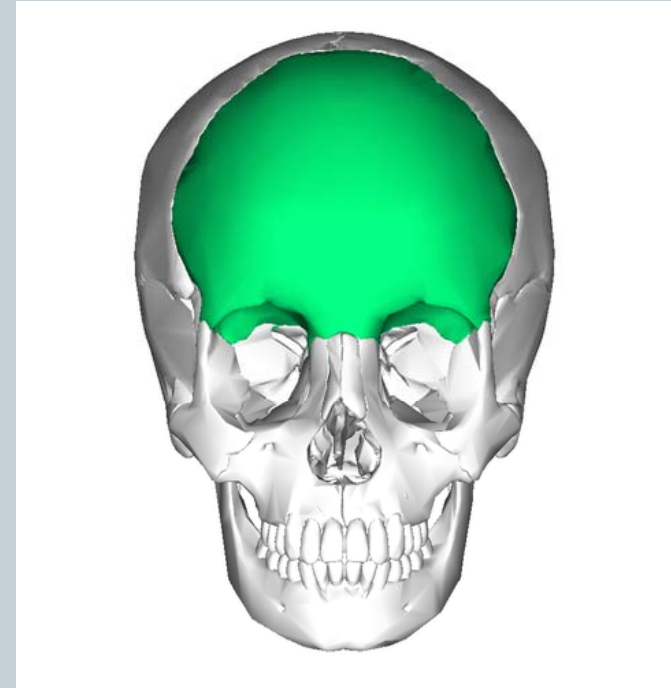


1. Vertical (squamous) part
2. Horizontal (orbital) part
3. Nasal part

- Posterior ridge
- Naso orbital ridge
- Supper ciliary arch
- Frontal tubercle
- Horizontal plate (orbit roof & ant. Cranial fossa)
- Ethmoidal notch

Clinical point:

- Metopic suture
- 2-8 years old
- metopism



Frontal bone

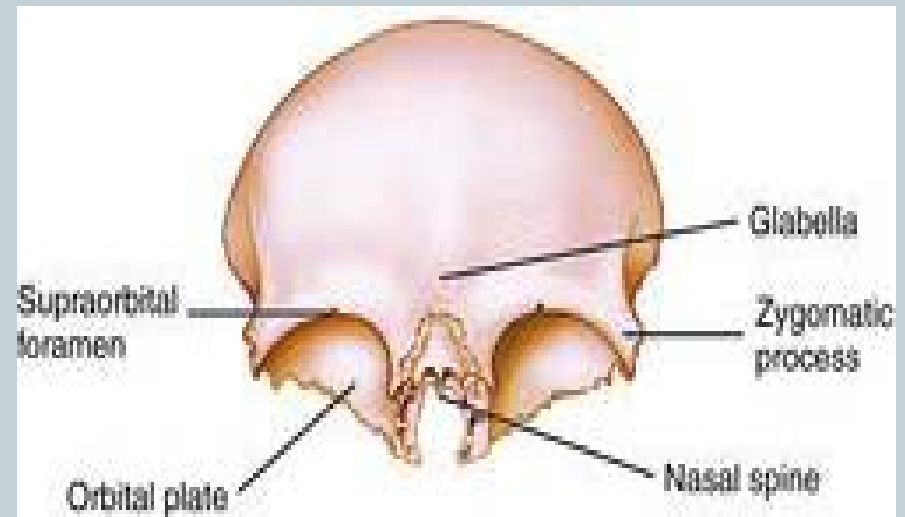
1. Vertical (squamous) part
2. Horizontal (orbital) part
3. Nasal part

- Posterior ridge
- Naso orbital ridge
- Supper ciliary arch
- Frontal tubercle

- Horizontal plate (orbit roof & ant. Cranial fossa)
- Ethmoidal notch

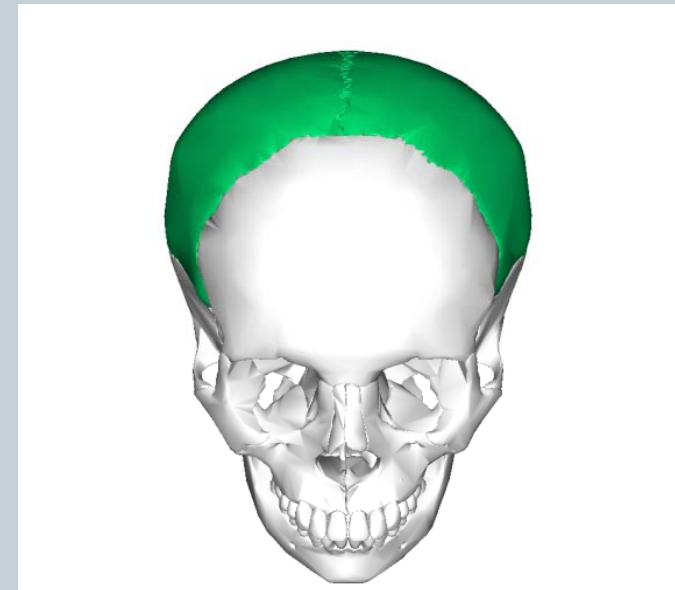
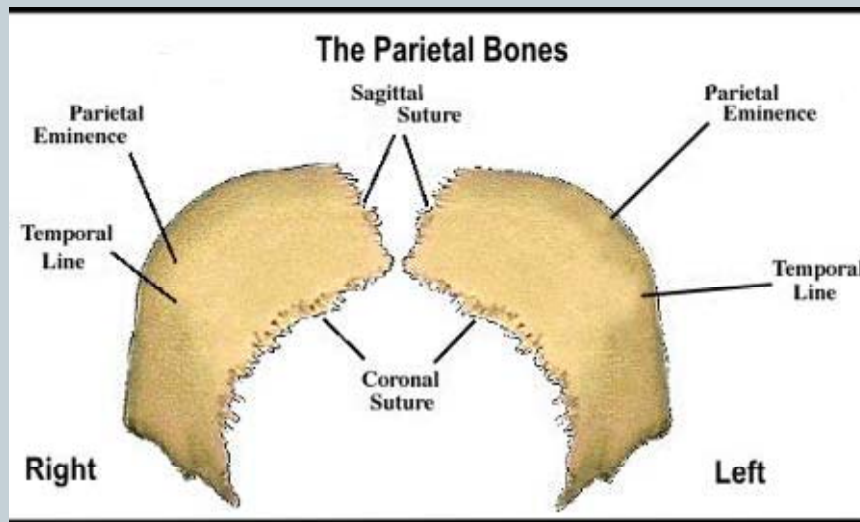
Clinical point:

- Metopic suture
- 2-8 years old
- metopism



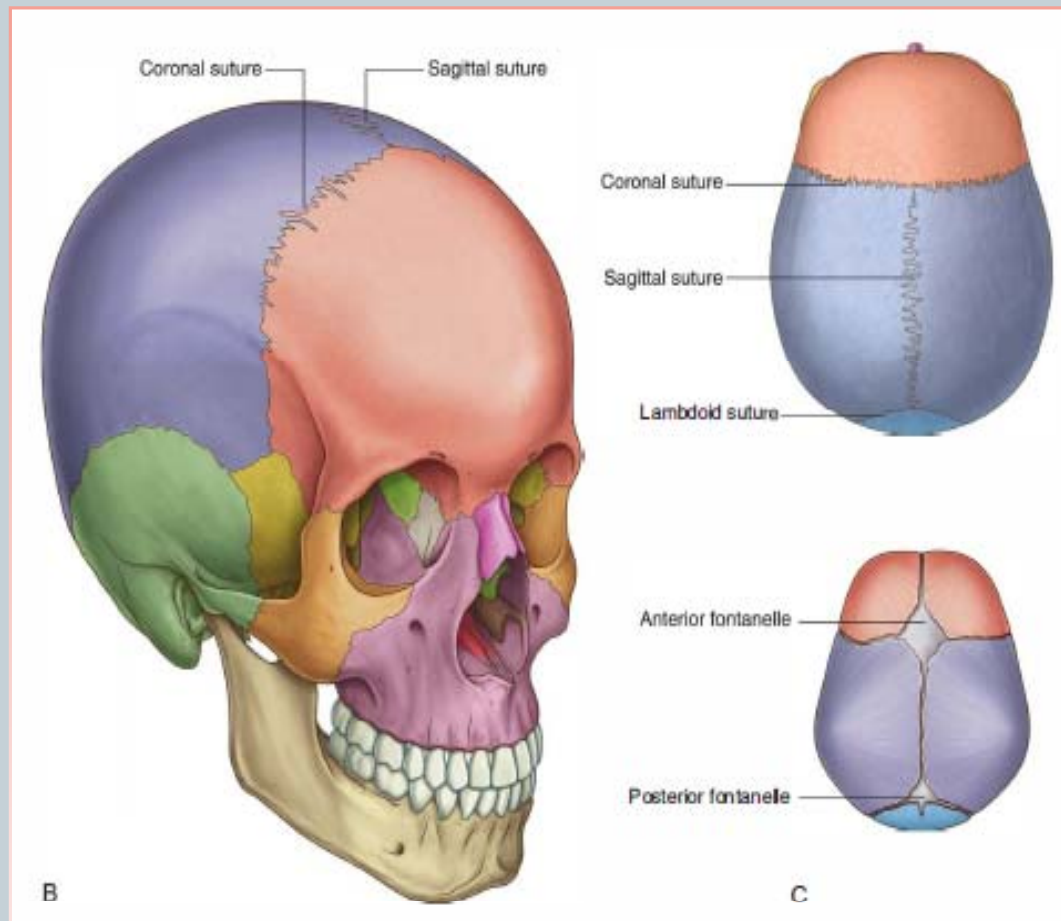
Parietal bone

- Roof & lateral part of skull
- Surface (internal & external)
- 4 borders
- 4 angles



Parietal bone

- Sagittal suture
- Frontal suture
- Lambdoid suture



Occipital bone

- Posterior part of skull
- skull floor (Posterior part)

Squamous part

- Interior surface
- Exterior surface

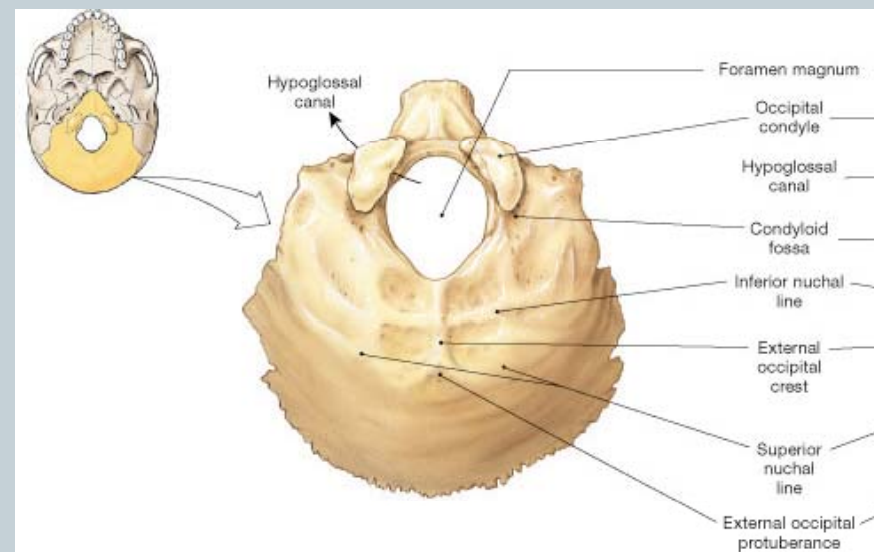
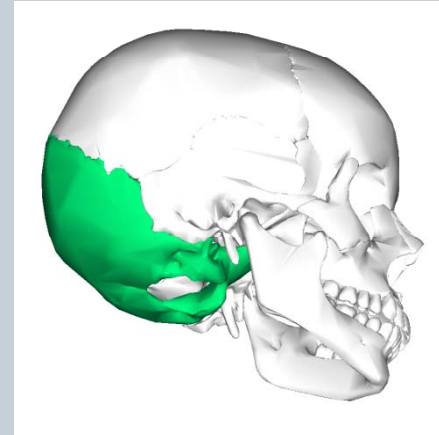
Basilar part

- Superior surface
- Inferior surface (Pharyngeal tubercle)

Lateral part

- Superior surface
- Inferior surface (condyle)

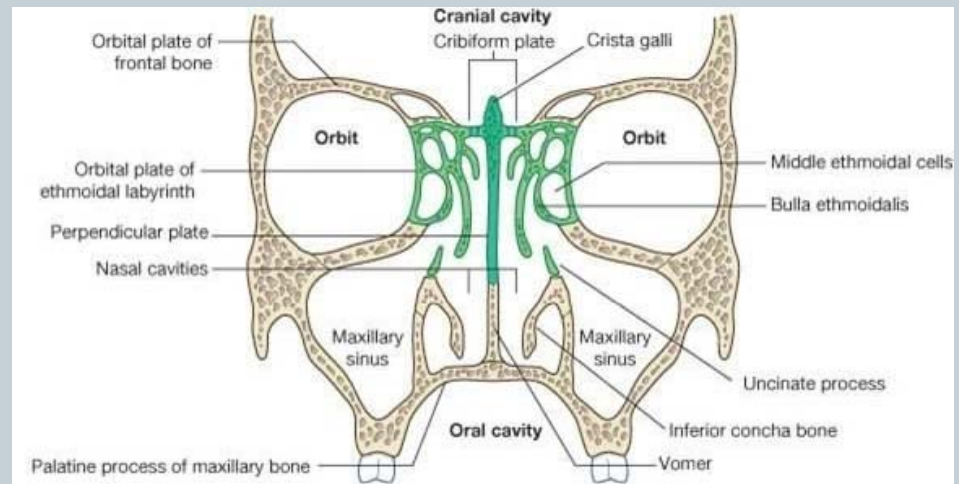
- Foramen magnum



Ethmoid bone

- Between frontal & sphenoid bones
- Skull floor
- Interior wall of Orbit
- Nasal wall

1. Cribriform (horizontal) plate
2. Perpendicular plate
3. Labyrinths



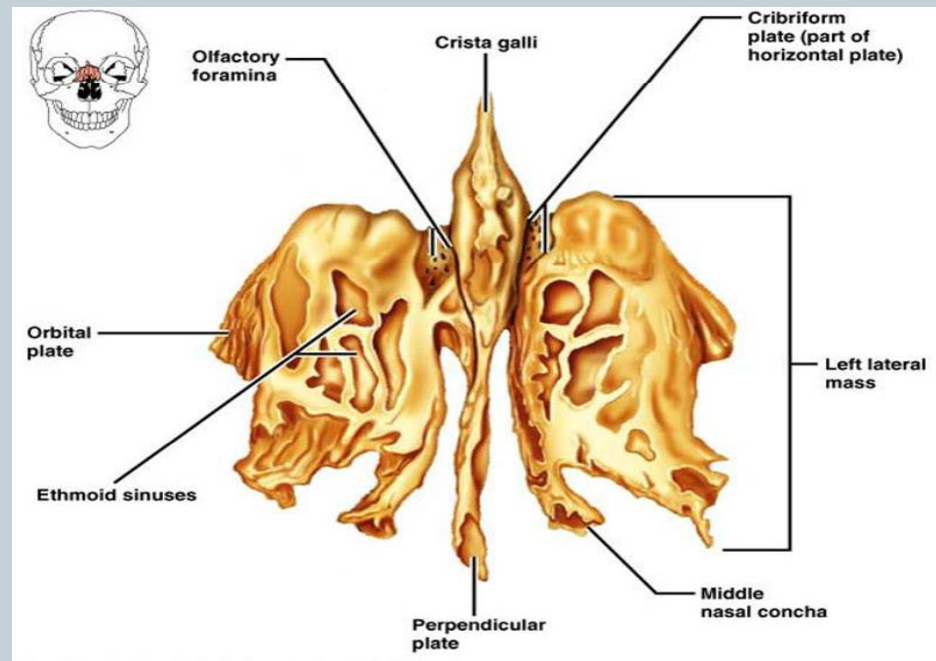
Ethmoid bone



- Between frontal & sphenoid bones

- Skull floor
- Interior wall of Orbit
- Nasal wall

1. Cribriform (horizontal) plate
2. Perpendicular plate
3. Labyrinths



Ethmoid bone

○ **Cribriform plate**

Superior (brain) surface

- Crista galli
- Foramen secum

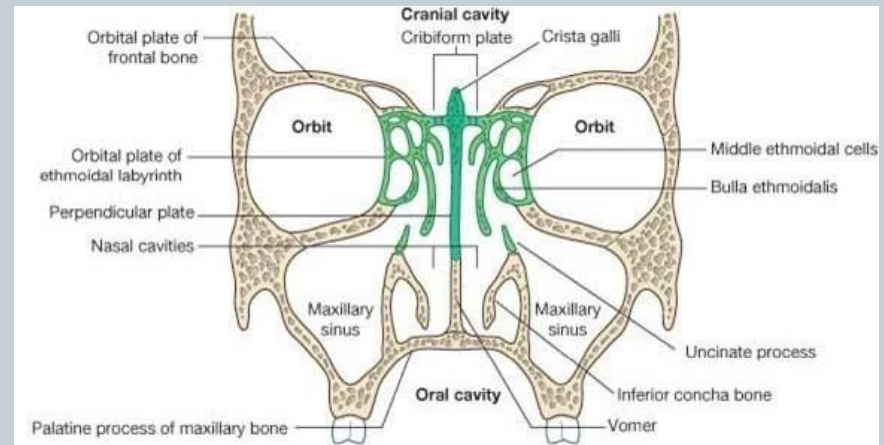
Inferior (nasal) surface

○ **Prependicular plate**

- Brain (superior) part (crista galli)
- Nasal (inferior) part (nasal septum)

○ **Labyrenths**

- Air cells
- Ethmoidal sunus
- Medial wall of orbit
- Lateral wall of nose
- Sup. & inf. Concha (meatus)



Sphenoid bone

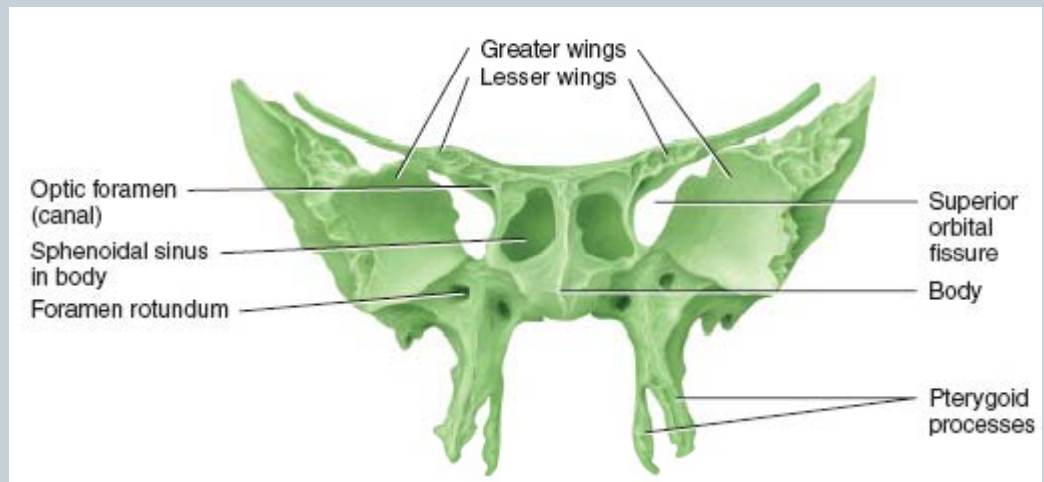
- Basal part of skull
- Temporal & Infra temporal
- Orbit

- Body
Sella turcica
sphenoid synus

- Greater wings

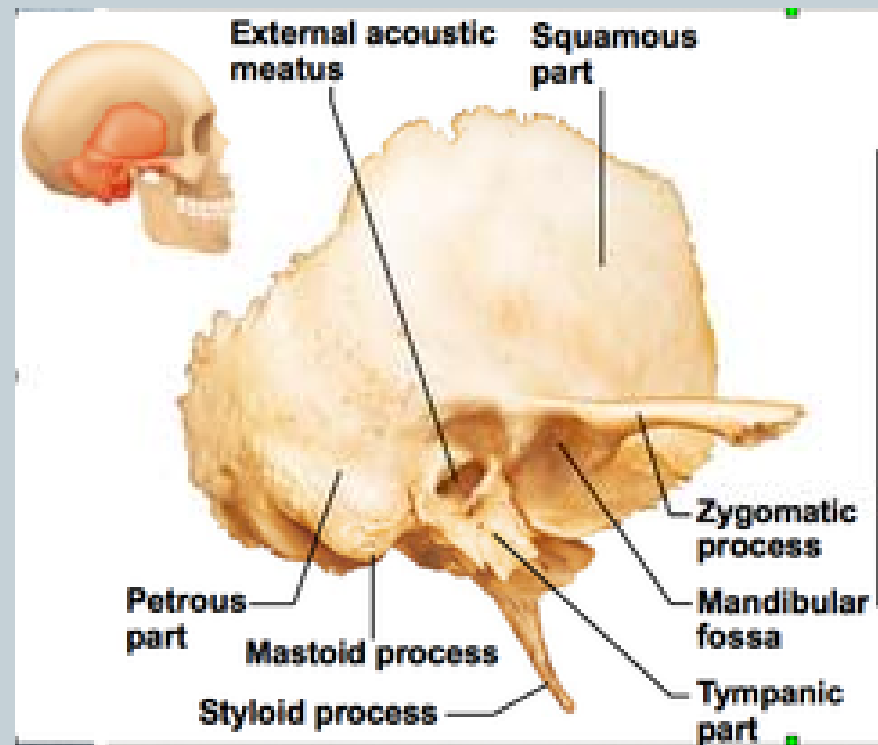
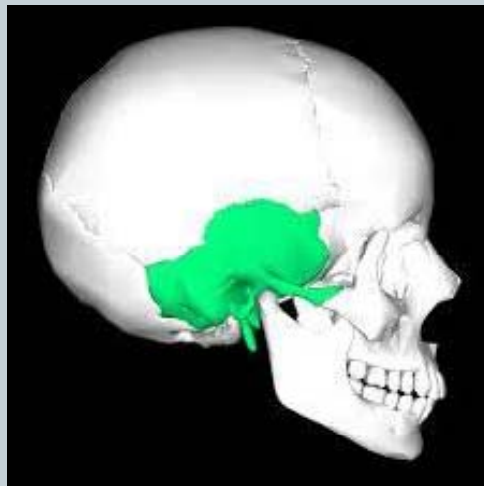
- Lesser wings

- Pterygoid process
pterygoid notch



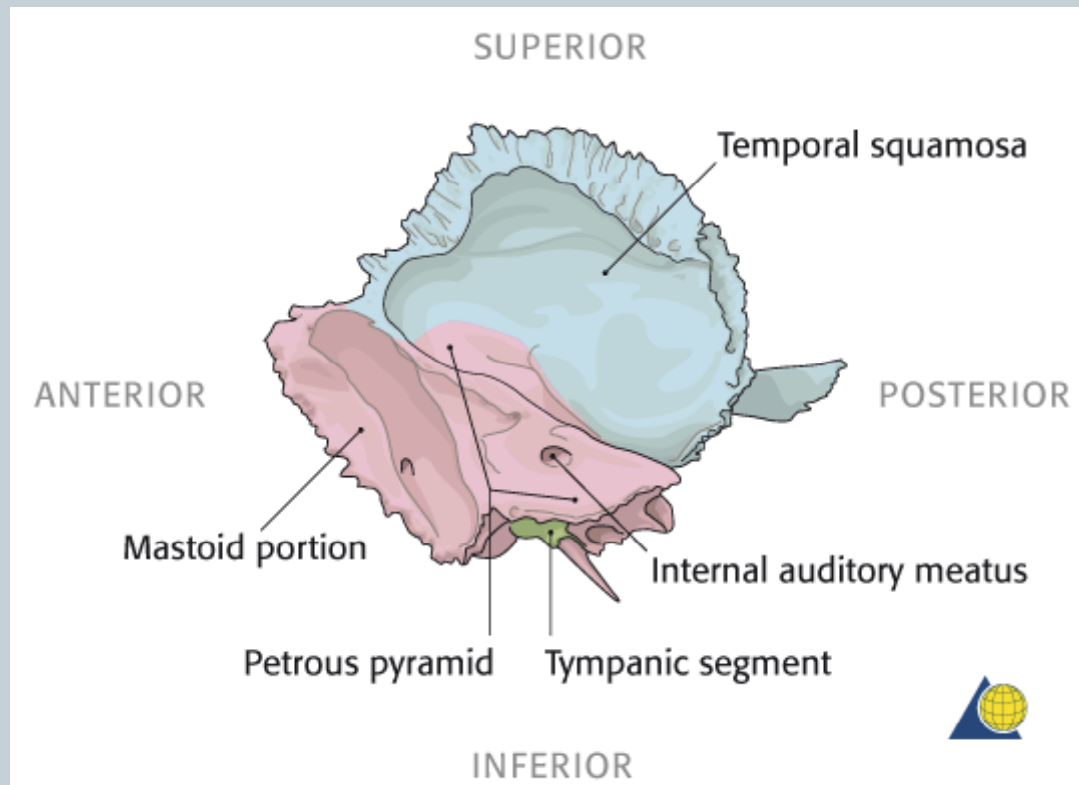
Temporal bone

- Lateral & basal part of skull
1. Squamous part (zygomatic process)
 2. Petrous part
 3. Mastoid part
 4. Tympanic part
 5. Styloid part



Temporal bone

- Lateral & basal part of skull
1. Squamous part (zygomatic process)
 2. Petrous part
 3. Mastoid part
 4. Tympanic part
 5. Styloid part



Mandible bone

- Body
- Ramus

2 Surfaces

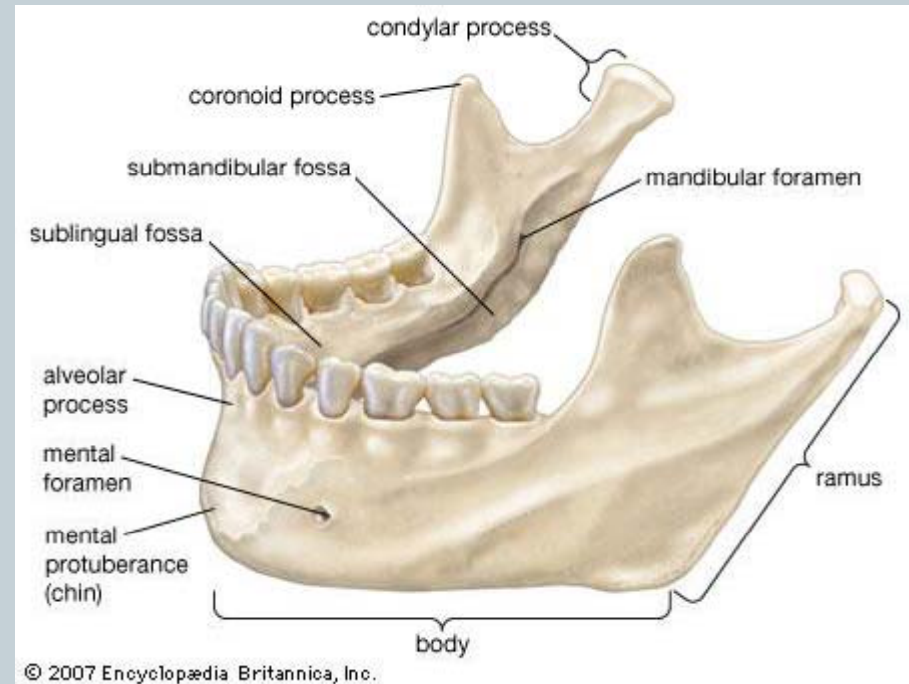
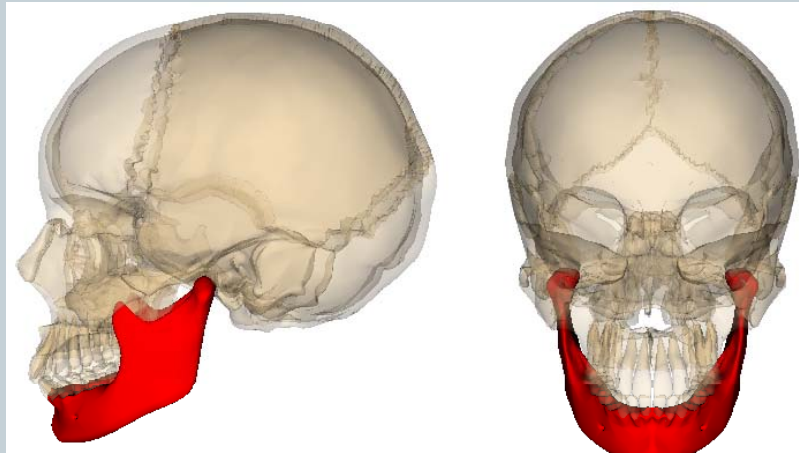
2 borders

Symphysis menti

Mental foramen

Mental protuberance

Oblique line



Mandible bone

- Mylohyoid line
- Submandibular fossa
- Sublingual fossa

Ramus

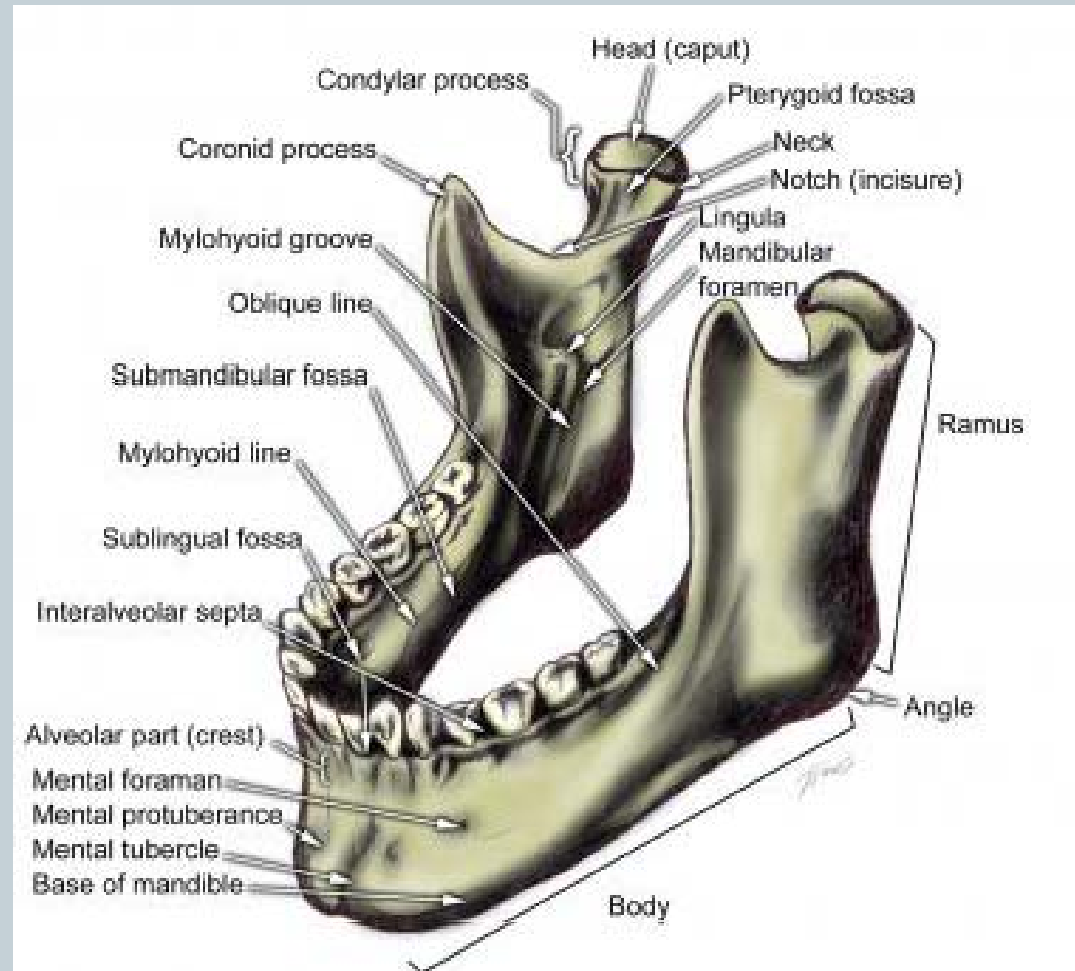
- 2 surfaces

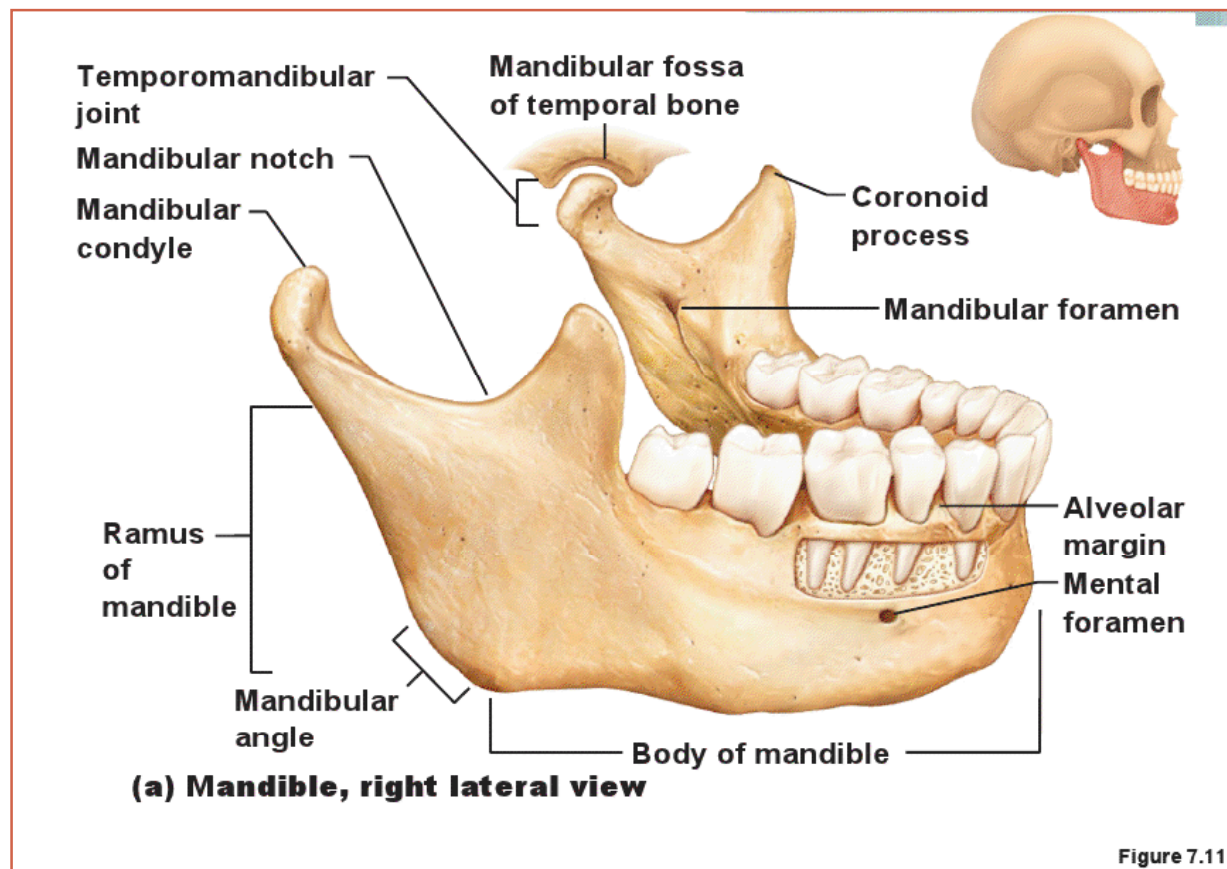
Masseter muscle
Mandibular foramen

- 4 borders
- 2 processes

Coronoid (temporal muscle)
Condylod (TMJ)

Mandibular notch





Maxilla bone

- Body
- 4 processes

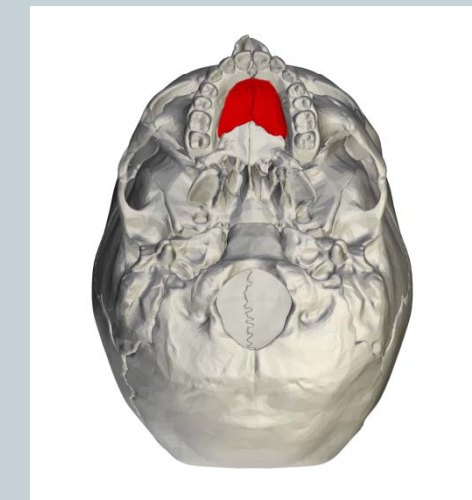
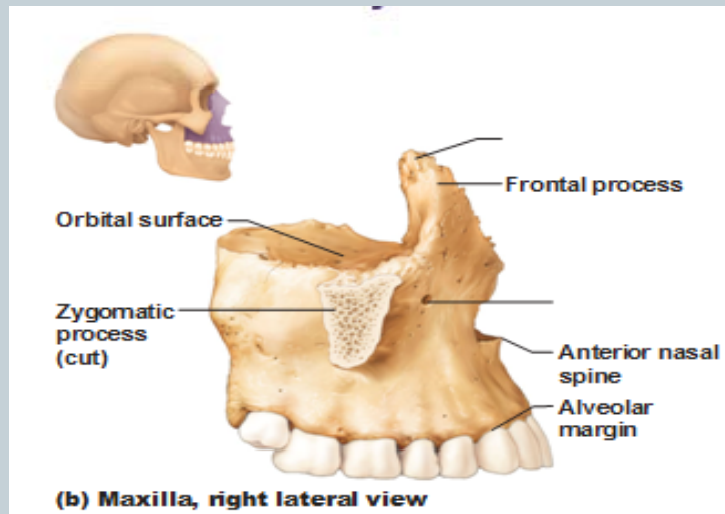
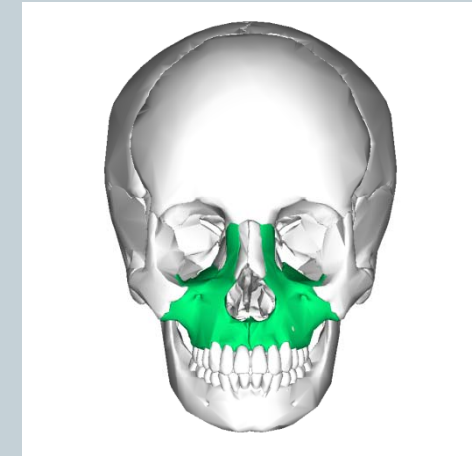
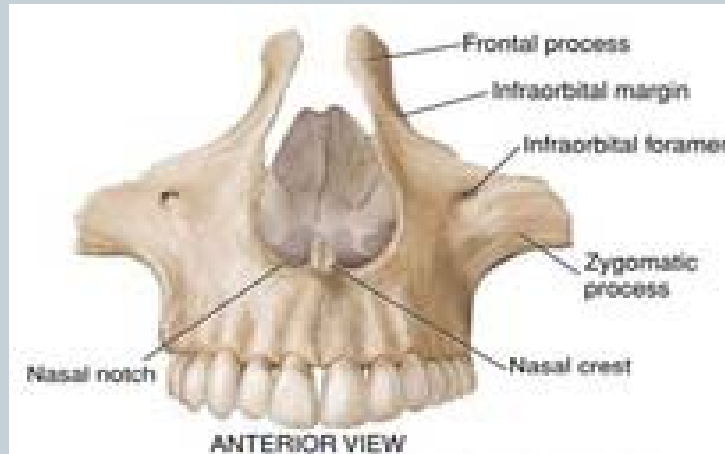
- **body**

Maxillary sinus

Nasal Middle meatus

Processes:

- Frontal process
- Zygomatic process
- Alveolar process
- Palatine process

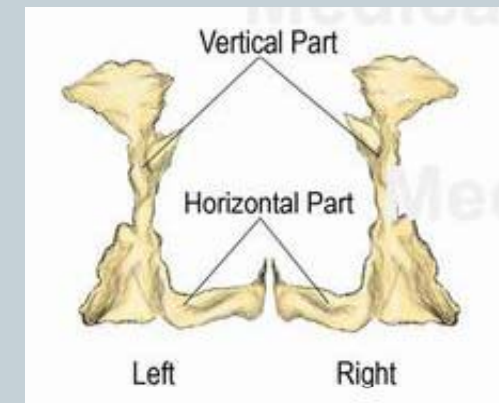
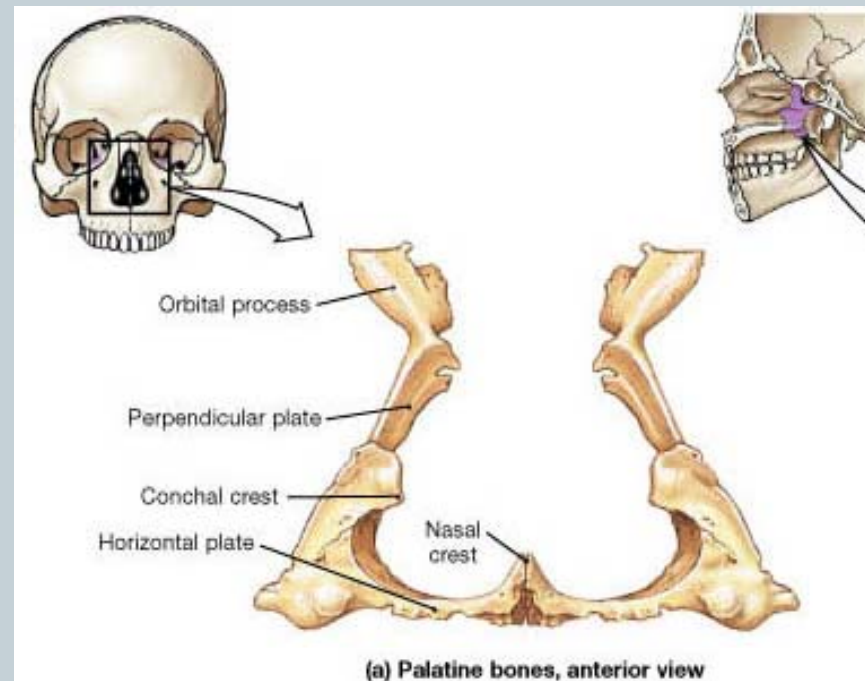


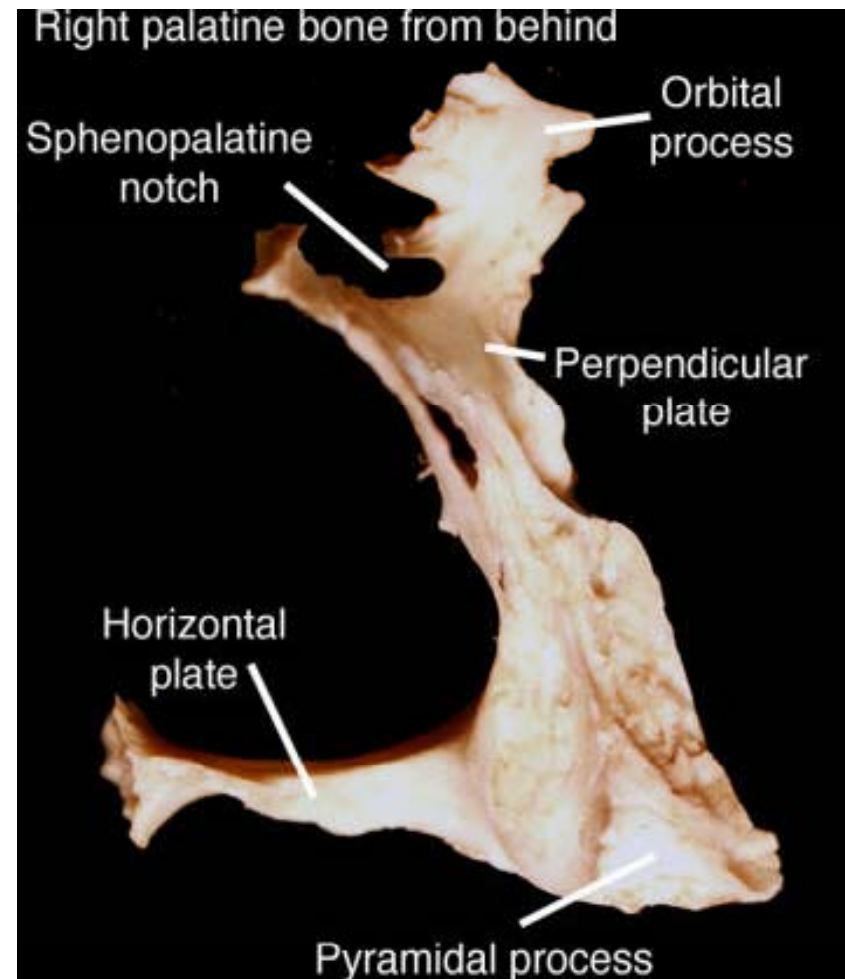
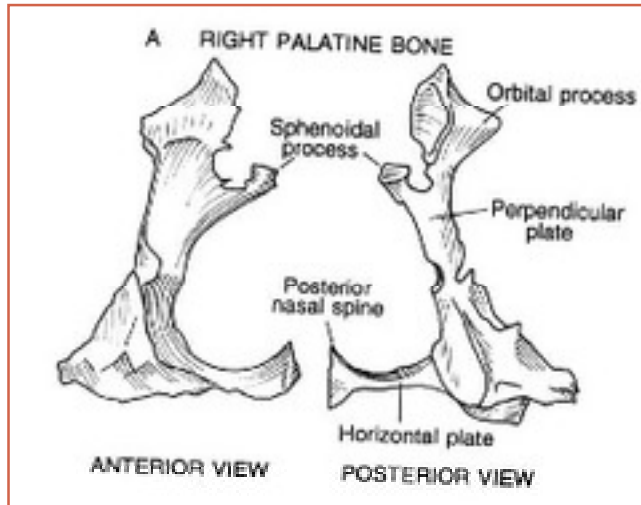
Palatine bone

- L shape
- Floor & lateral wall of nose
- Mouth roof
- Orbit roof

• 2 plates
Horizontal
Perpendicular

• 3 processes
Orbital
Sphenoidal
pyramidal



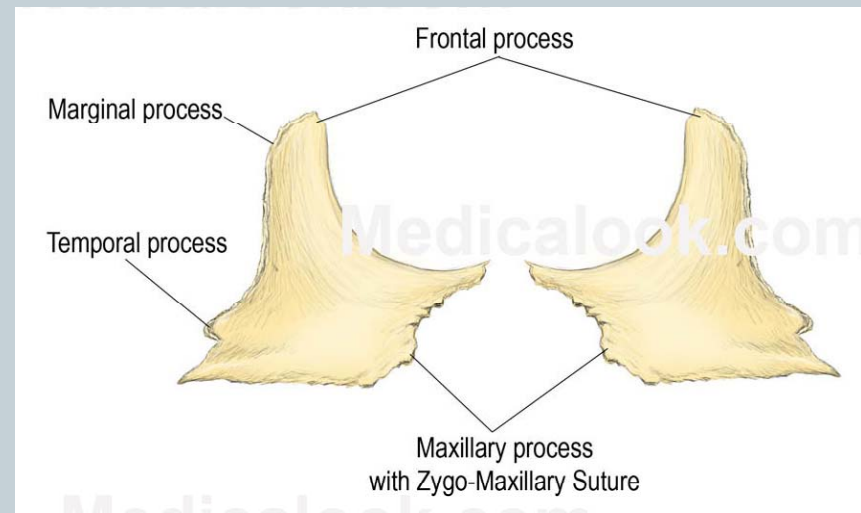
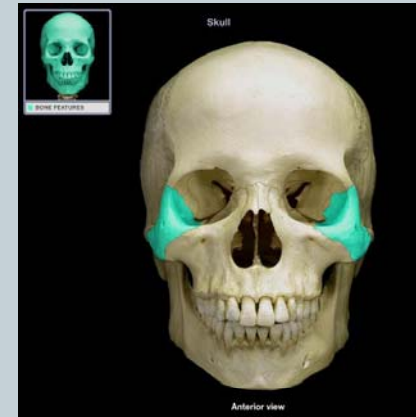
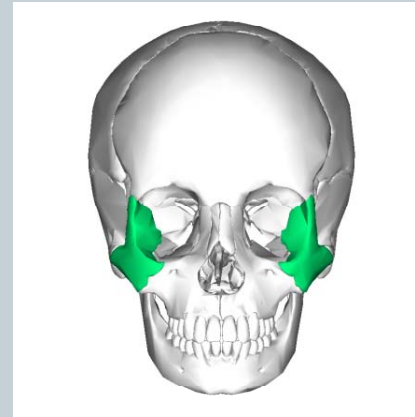


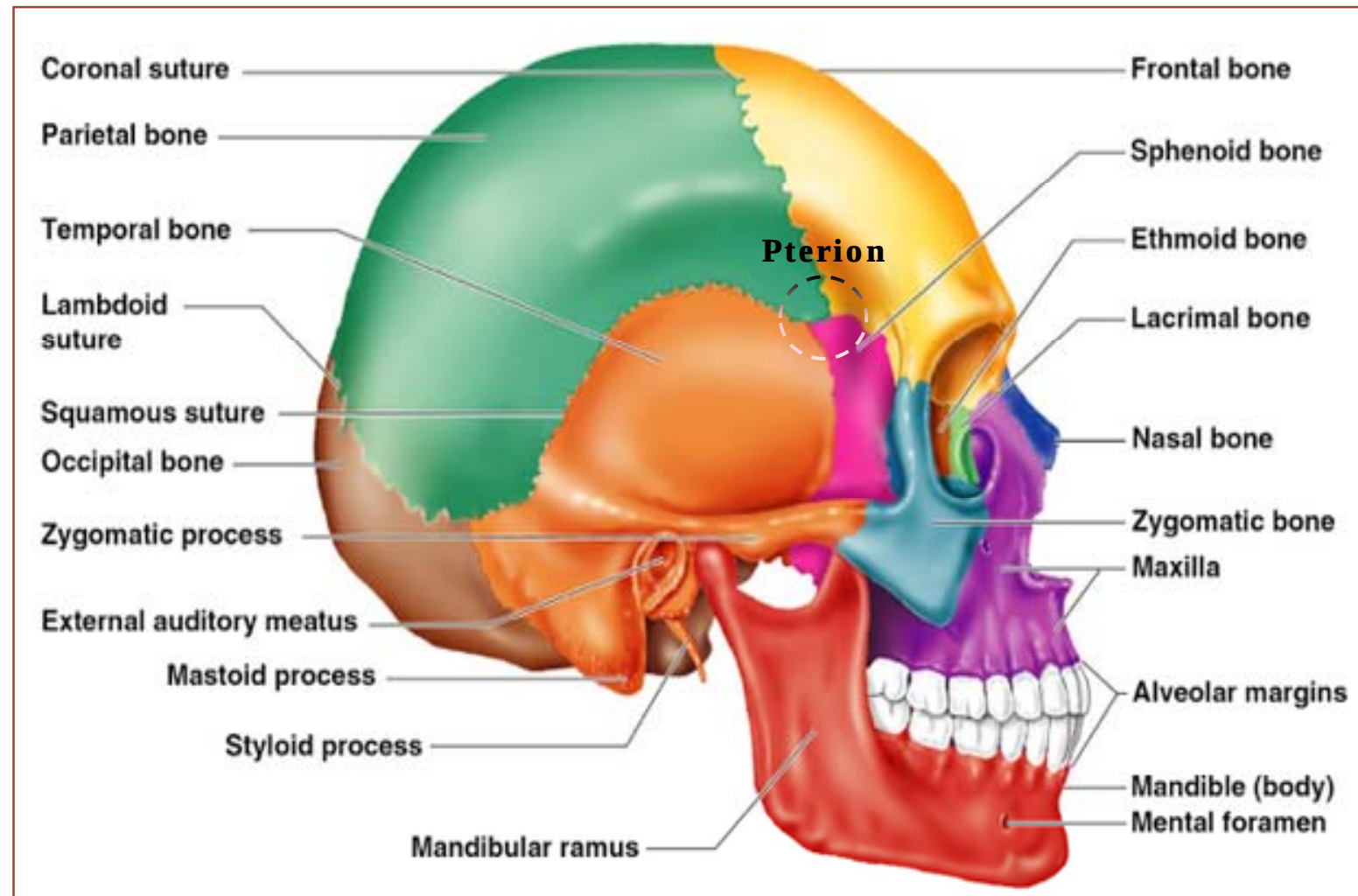
Zygomatic bone

- Orbit Lateral wall & floor
- Temporal & infra temporal fossa

Surface:

- Lateral
- Temporal
- Orbital



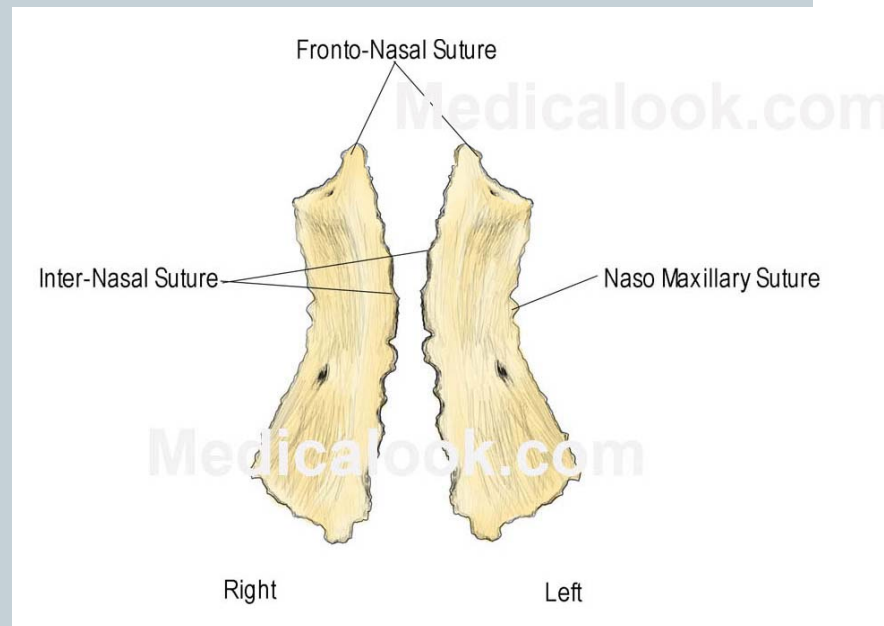
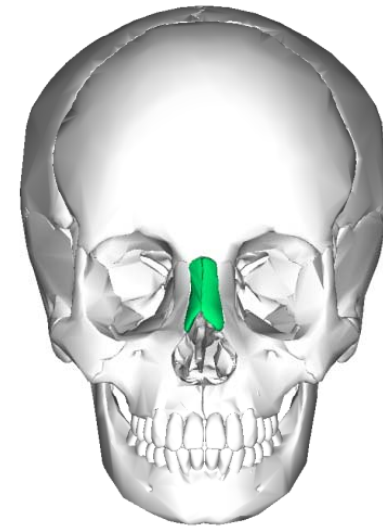


Nasal bone

- Nasal bridge

Surface:

- Medial
- Lateral
- Very thin bone

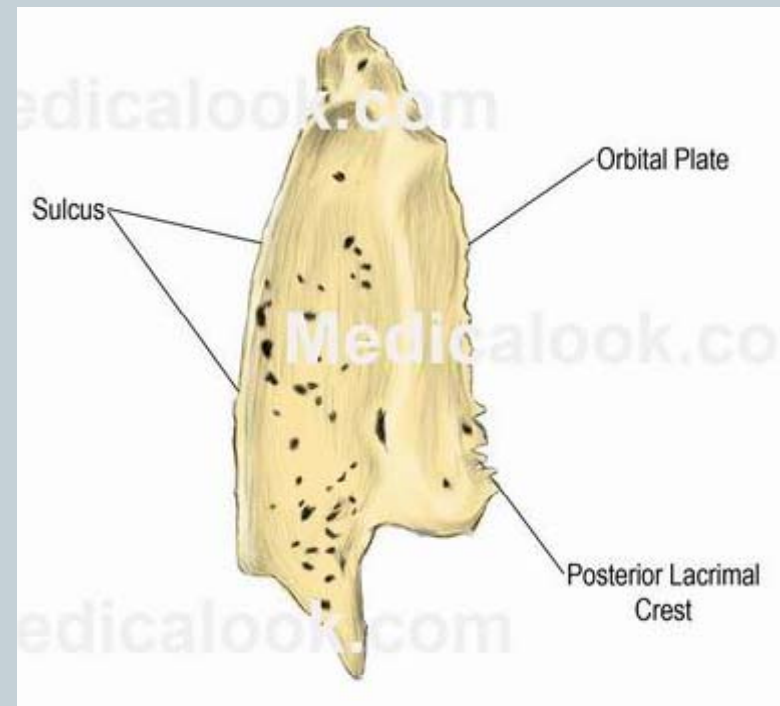
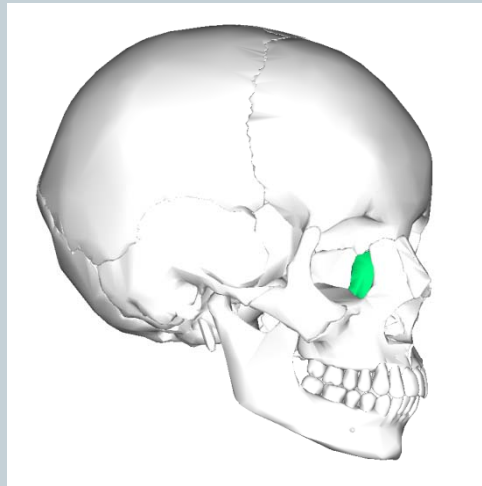


Lacrimal bone

- Orbit medial wall
- Nose lateral wall

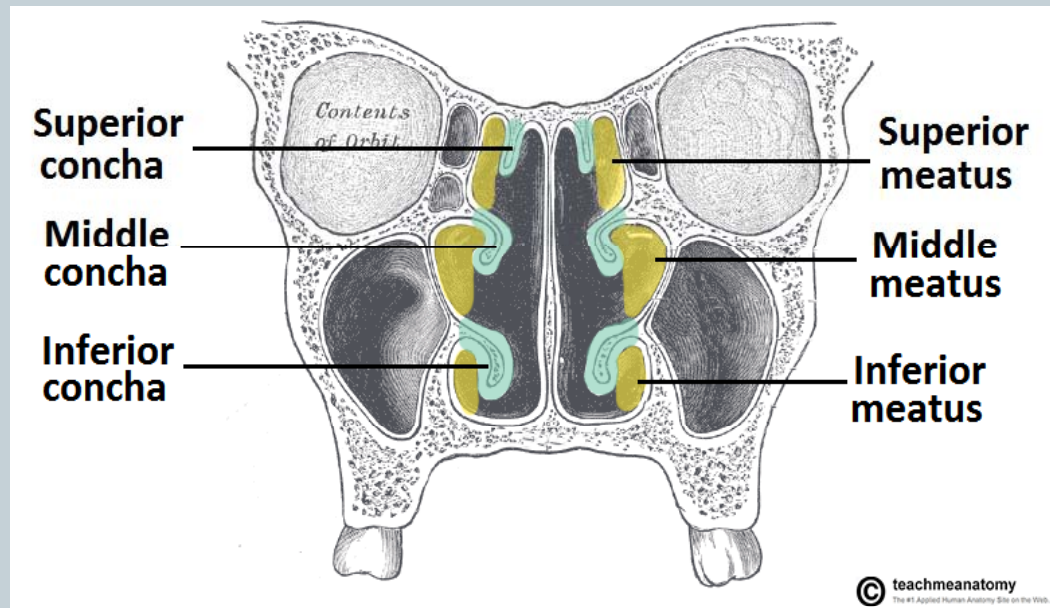
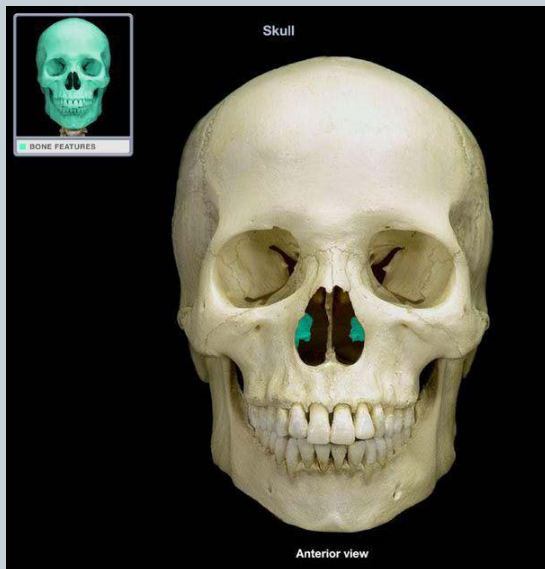
Surface

- Lateral
Nasal Middle meatus
- Medial
Lacrimal groove



Inferior concha

- Nasal Lateral wall (Inferior part)
- Superior concha (ethmoid)
- Middle concha (ethmoid)

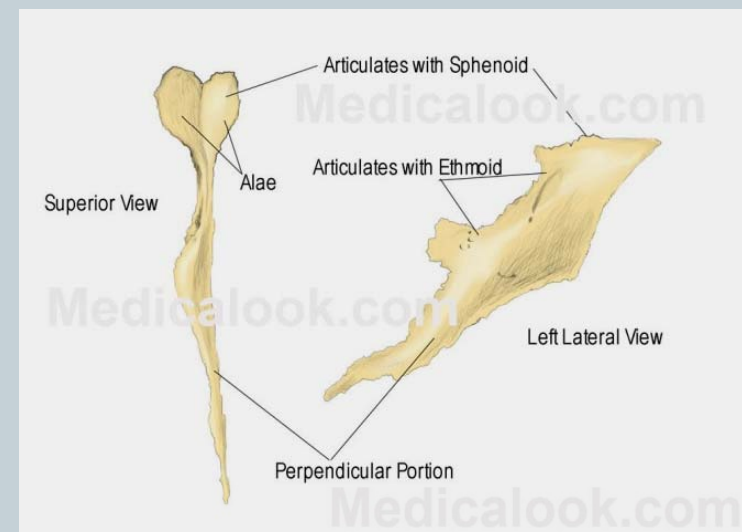
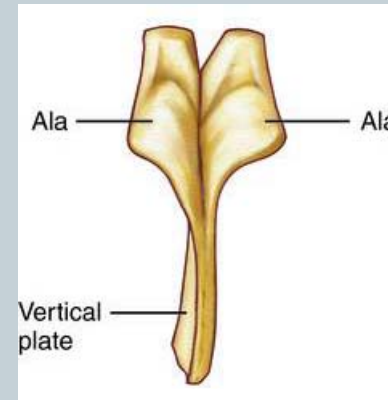


Vomer bone

- Postero inferior part of nasal septum
- Lateral surface

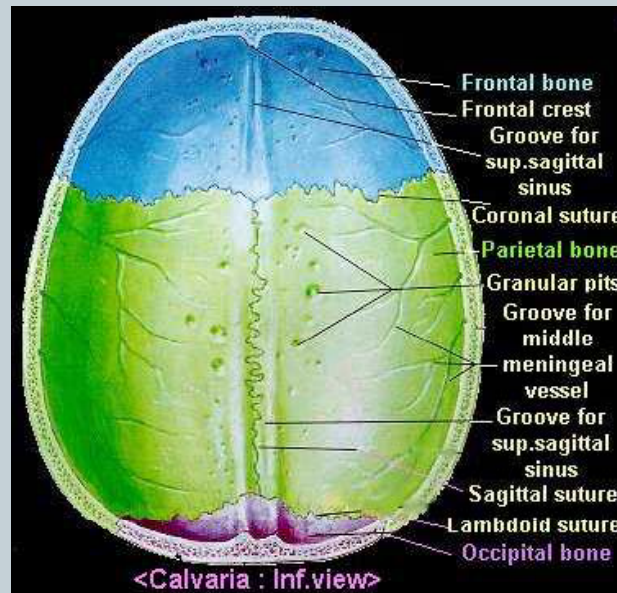
Borders

- Anterior
- Posterior
- Superior (vomer ala)
- Inferior (nasal septum)

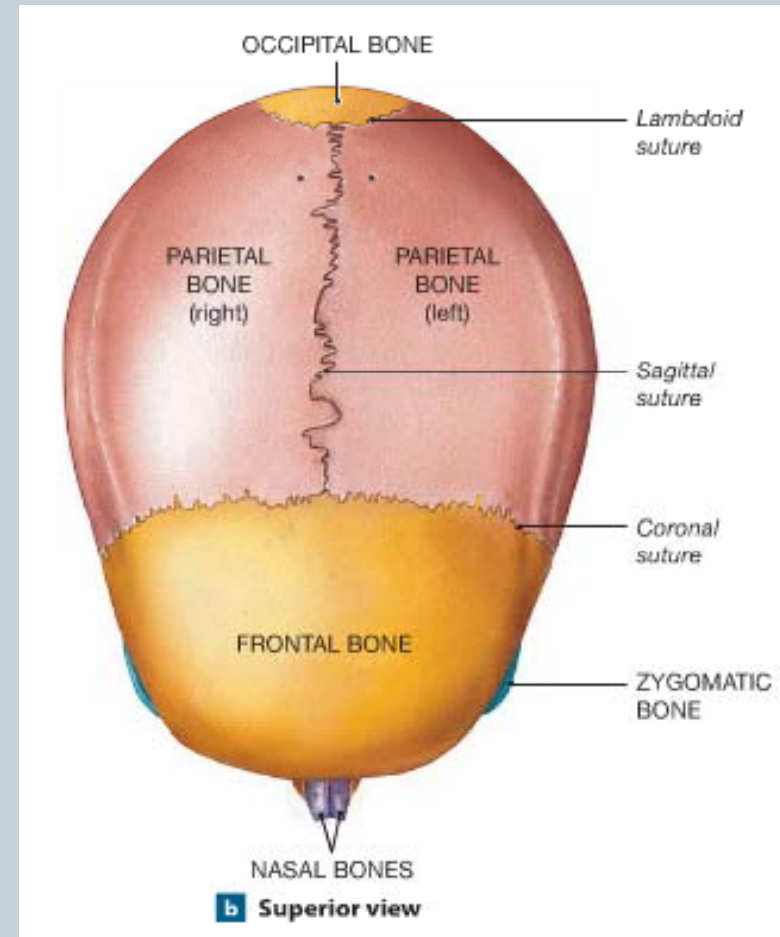


Skull norma verticalis (superior)

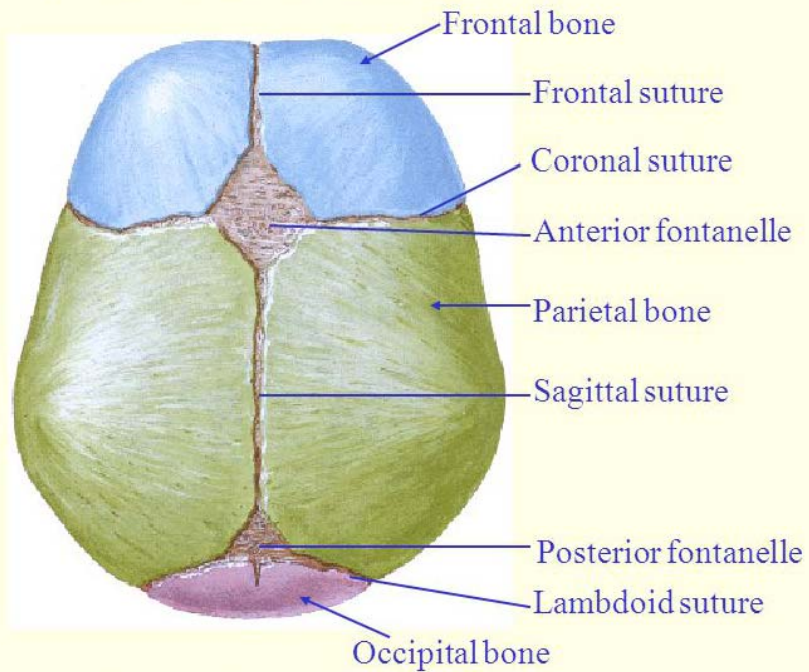
- Oval shape
- Bone
 - Frontal
 - Occipital
 - Parietal
- suture
 - Coronal (frontal)
 - Sagittal
 - Lambdoid



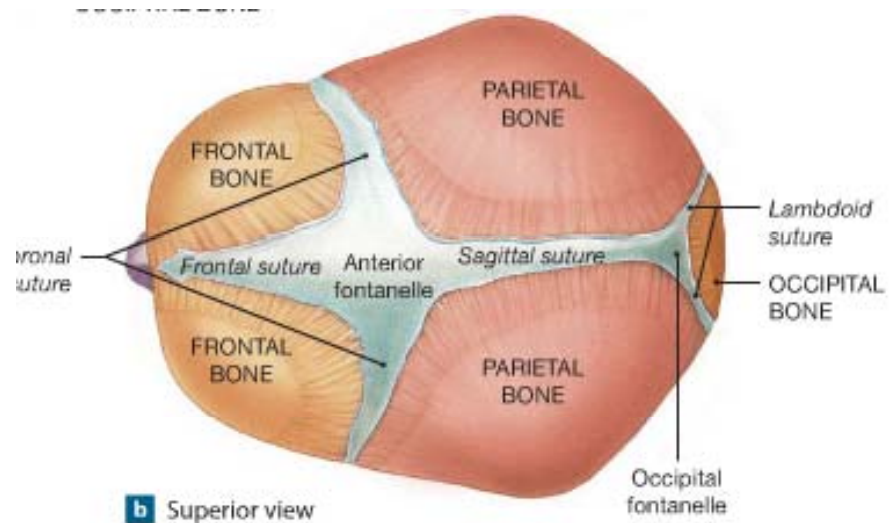
Vault
Vertex
Lambda (2-3 month)
Bregma (1.5 year)
Parietal prominence



IV. The Skull at Birth



Superior view



Skull norma frontalis

- Bone:

Frontal

Maxilla

Zygomatic

Nasal

Mandible

Nasal fossa

Orbit

Orbital notch (vessels & nerve)

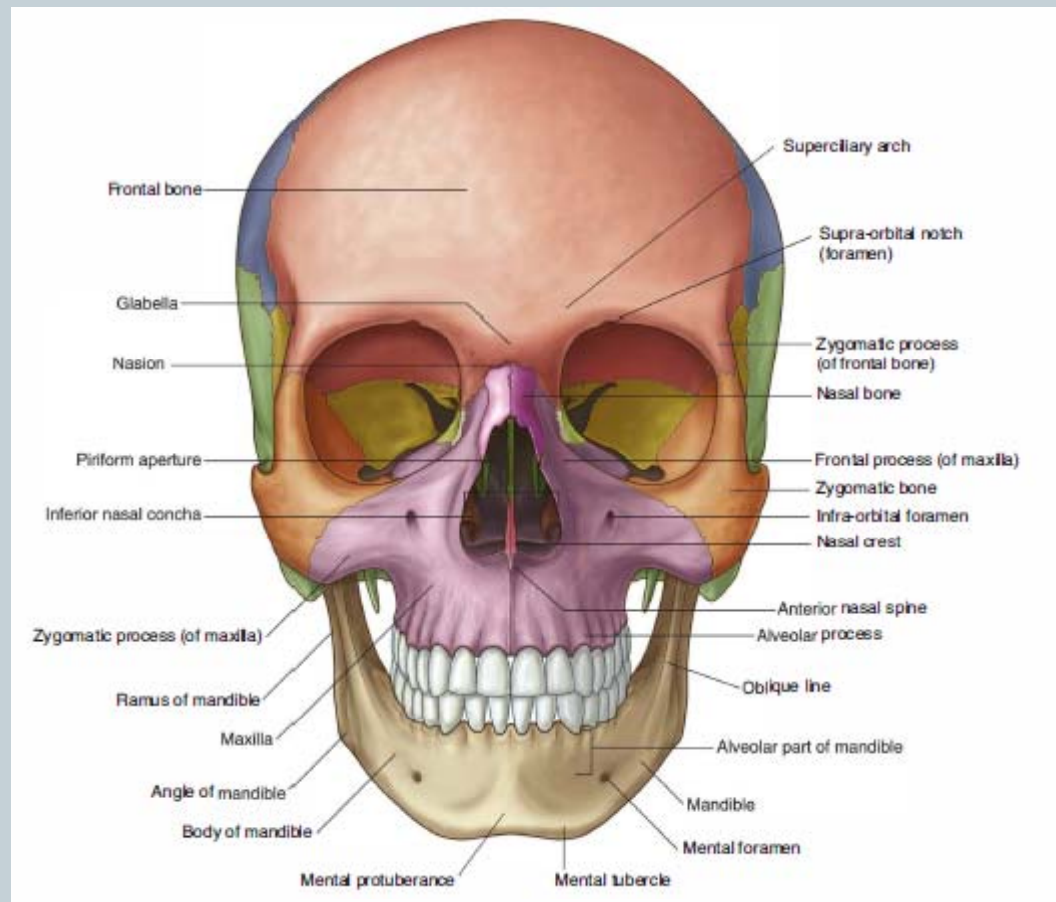
Super ciliary arch (frontal sinus)

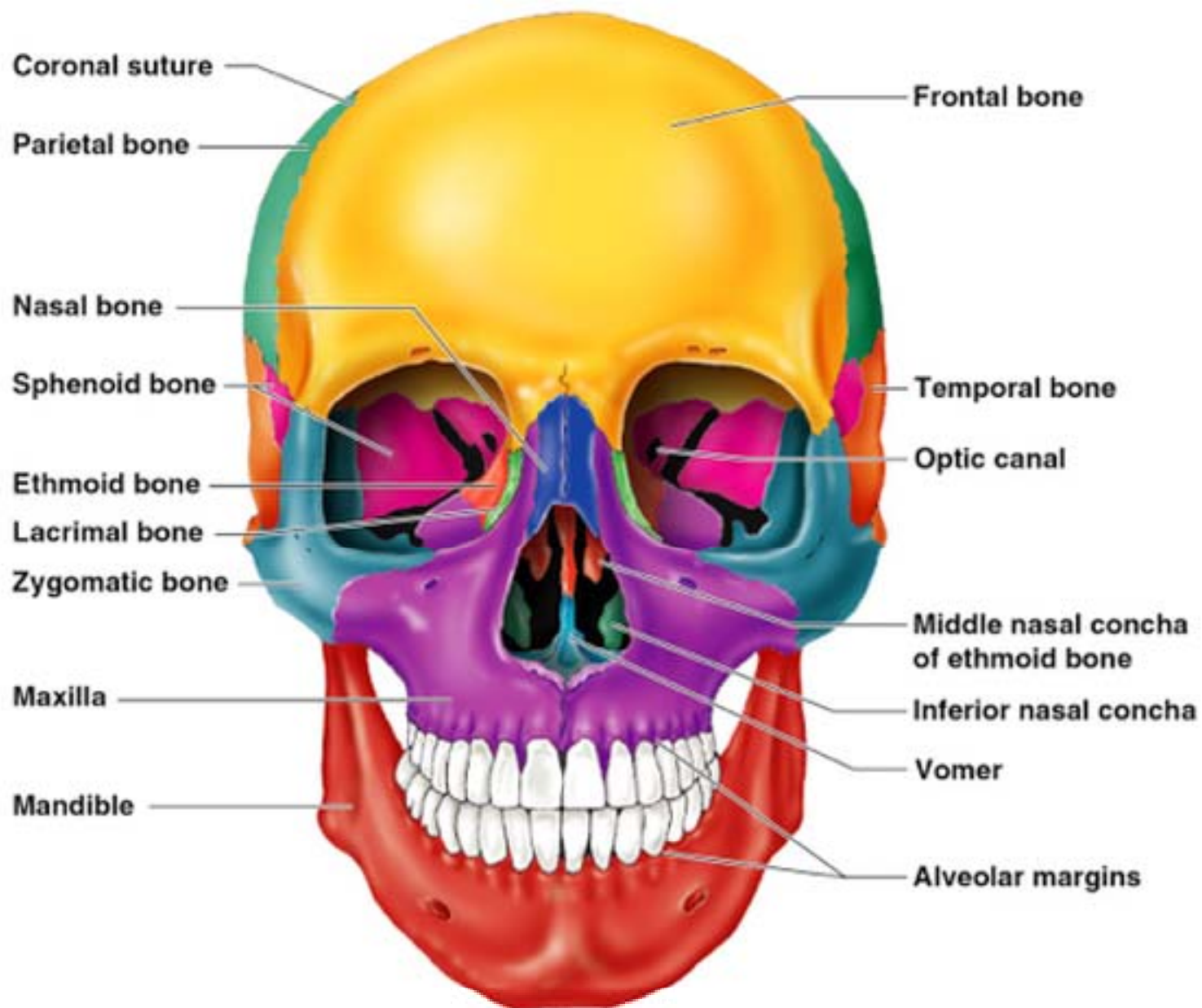
Infra orbital foramen (vessels & nerve)

Mental foramen

Alveolar process

Mental protuberance





Skull norma occipitalis



- Bone

Parietal

Occipital

Temporal

- Suture

Lambda

Occipitomastoid (mastoid foramen)

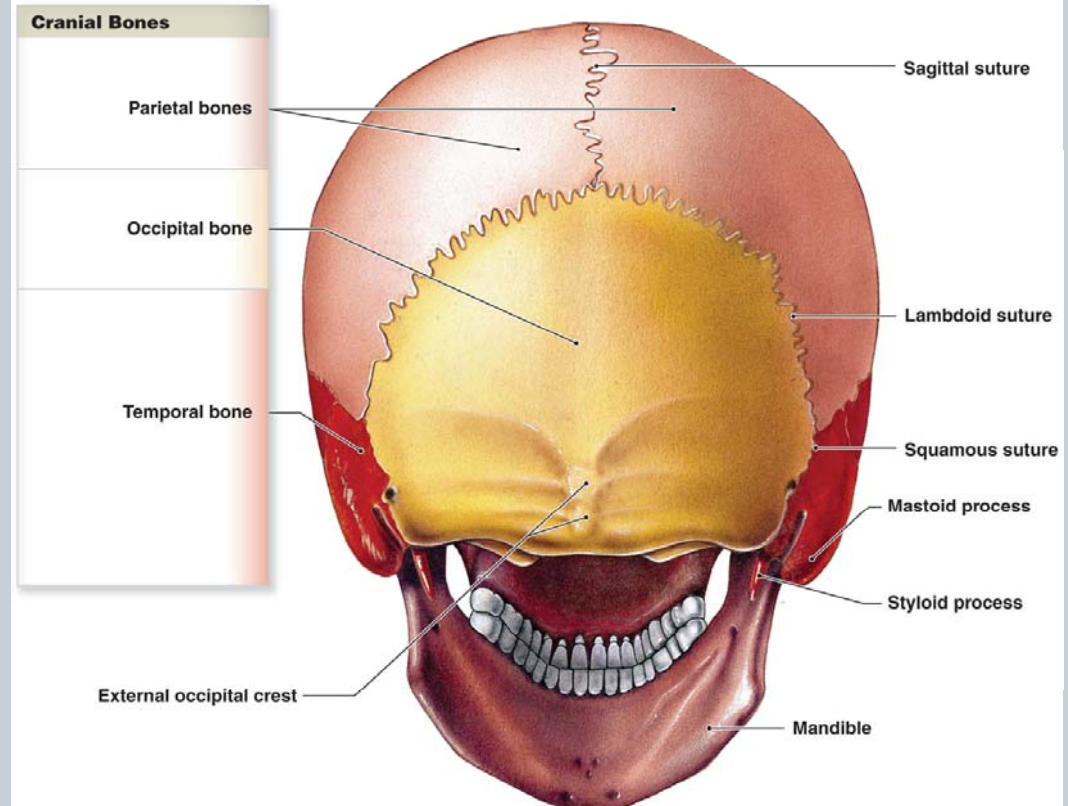
Sagittal

Exterior occipital protuberance

Superior nuchal line

External occipital crest to foramen magnum

The bones of the skull in posterior view



Skull norma lateralis

- Bone

Frontal

Parietal

Temporal

Zygomatic

Sphenoid

Maxilla

Mandible

Nasal

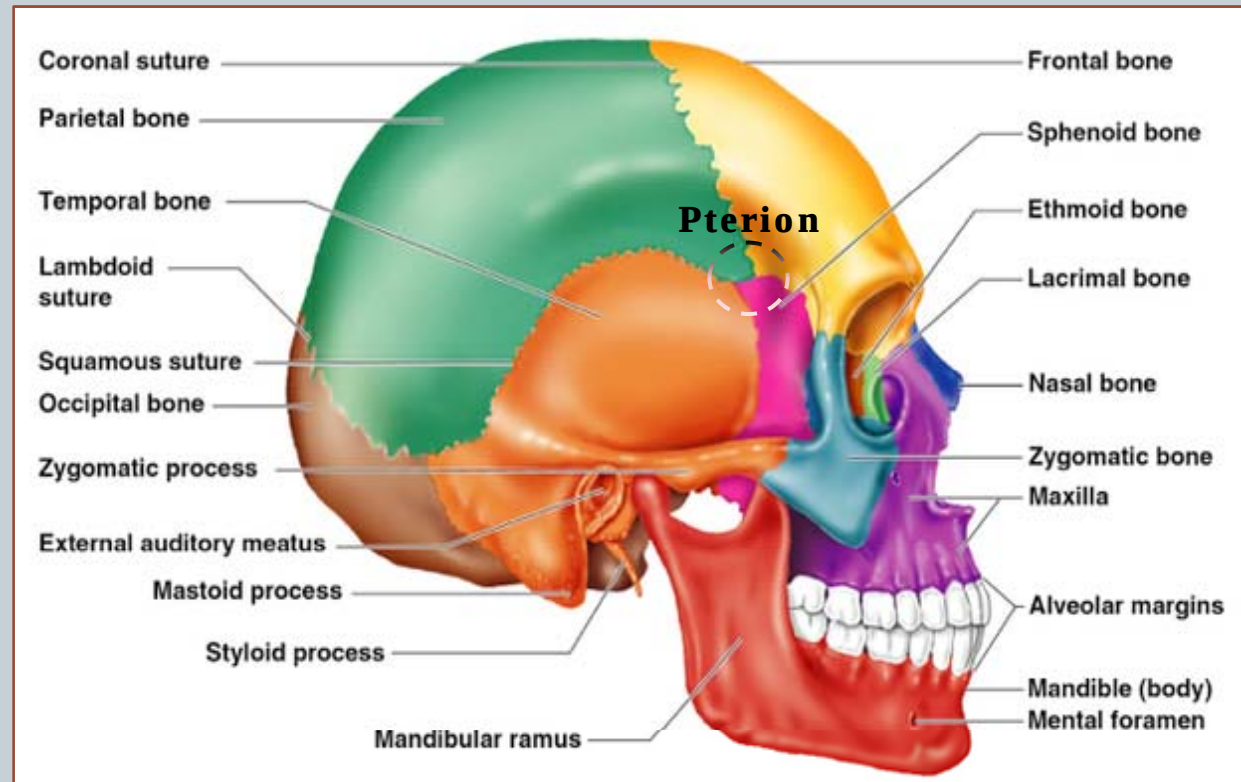
Pterion

External acoustic meatus

Styloid & mastoid processes

Sup. & inf. Temporal line

Temporal & infratemporal fossa



Temporal & infra temporal fossa

Temporal fossa between

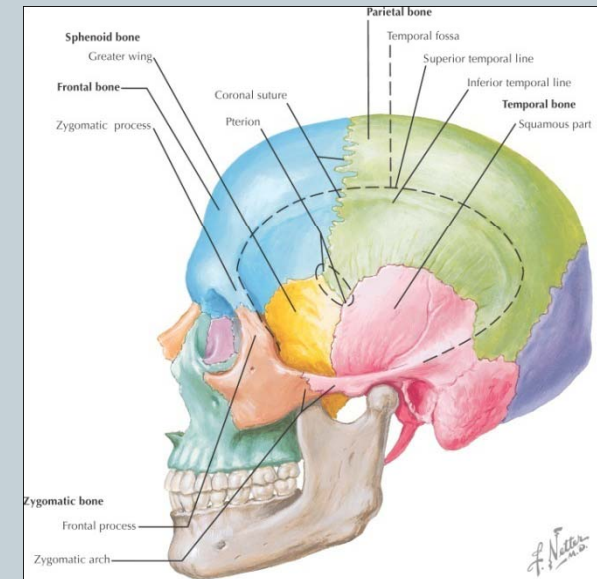
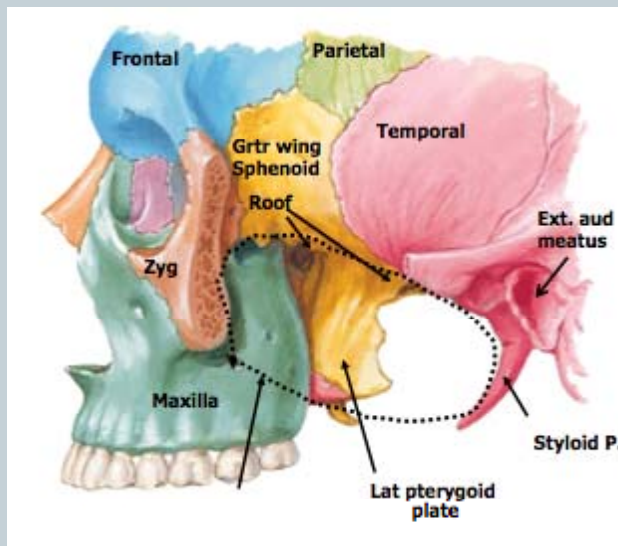
- Temporal line
- Zygomatic arch

Pterion

Infra temporal fossa

Pterygomaxillary fissure

Pterygopalatine fossa

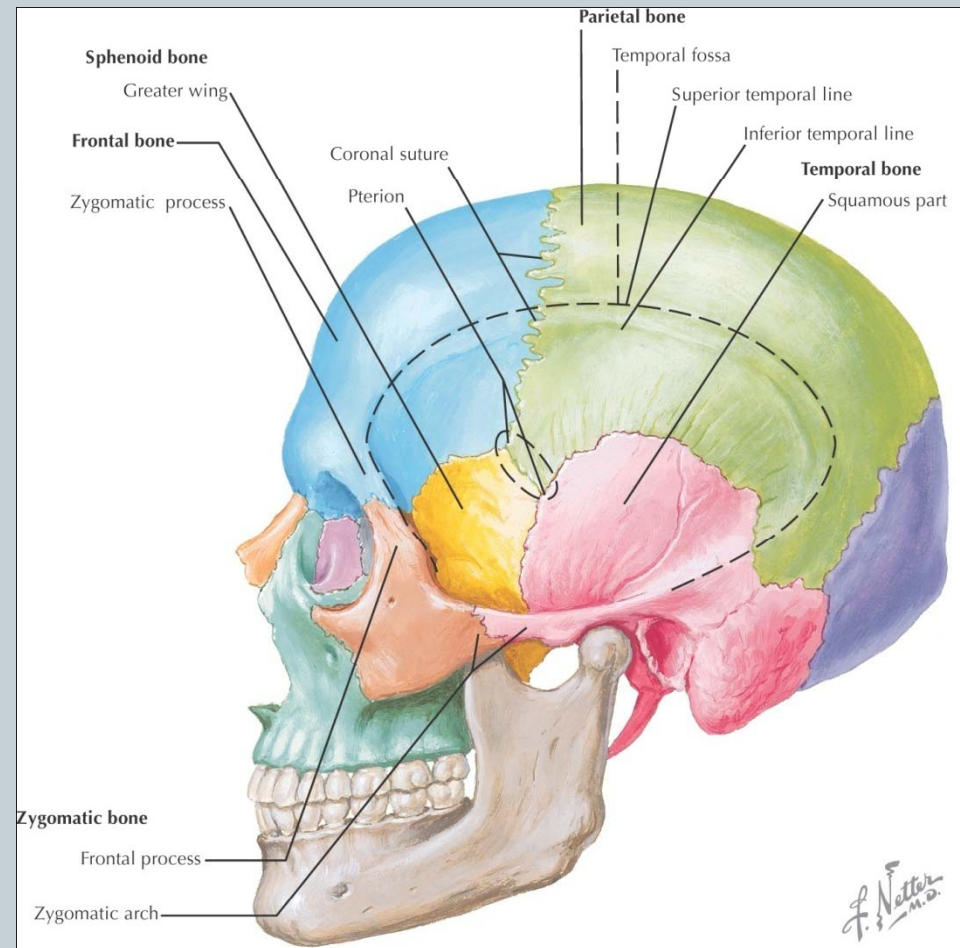
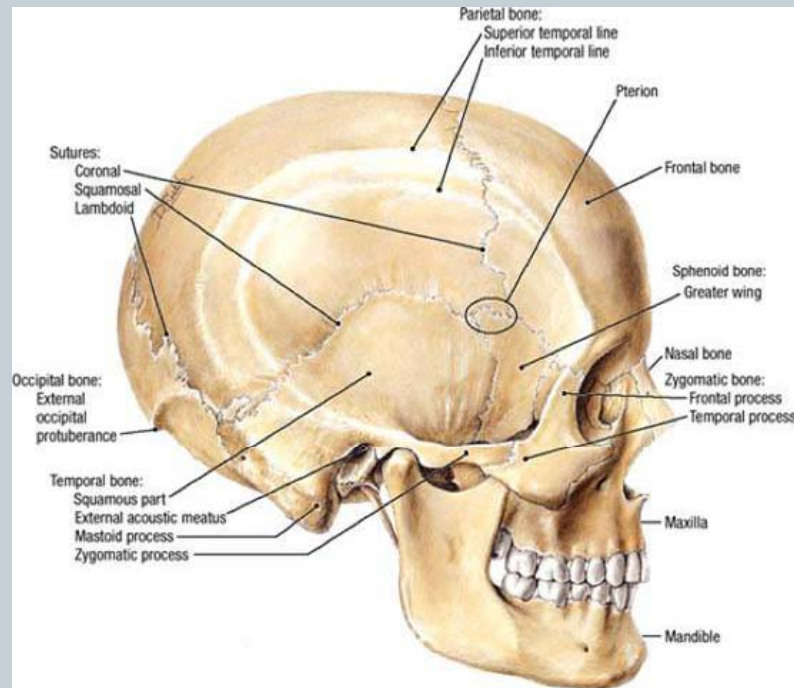


Temporal fossa

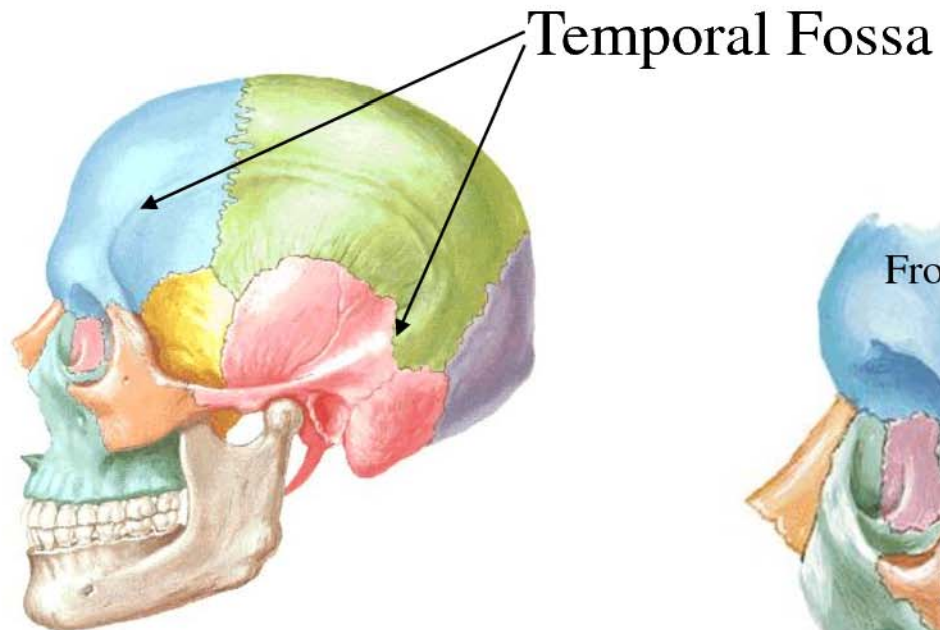
Temporal fossa between

- Temporal line
- Zygomatic arch

Pterion



Identify the boundaries of the infratemporal fossa.



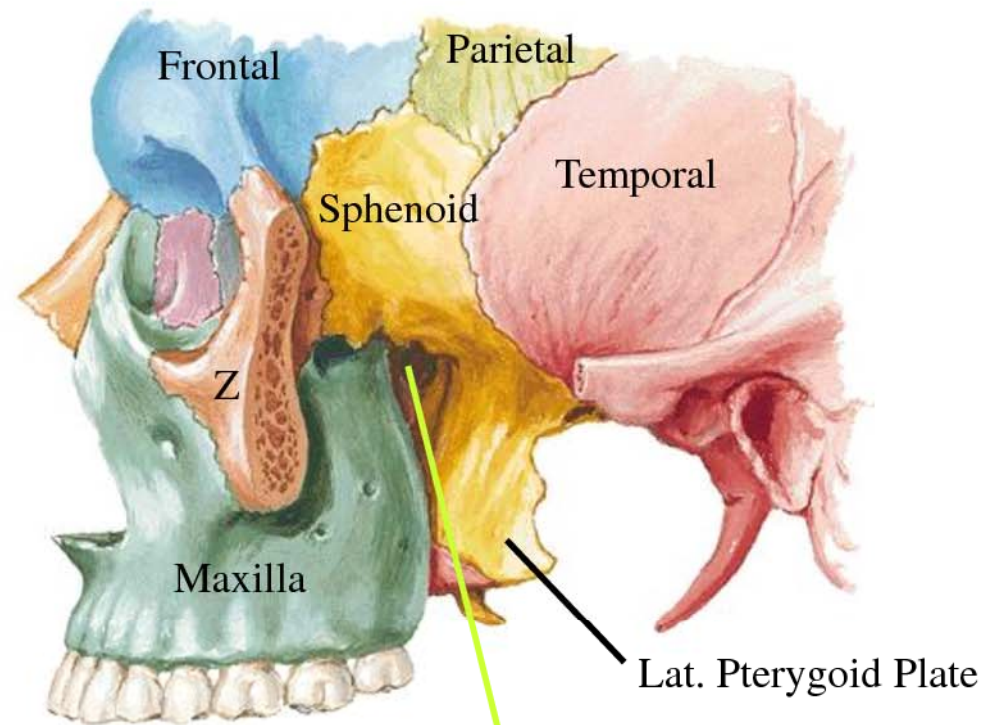
Boundaries:

Lateral=Ramus of Mandible

Anterior=Maxilla

Medial=Lat. Pterygoid Plate

Roof=Sphenoid

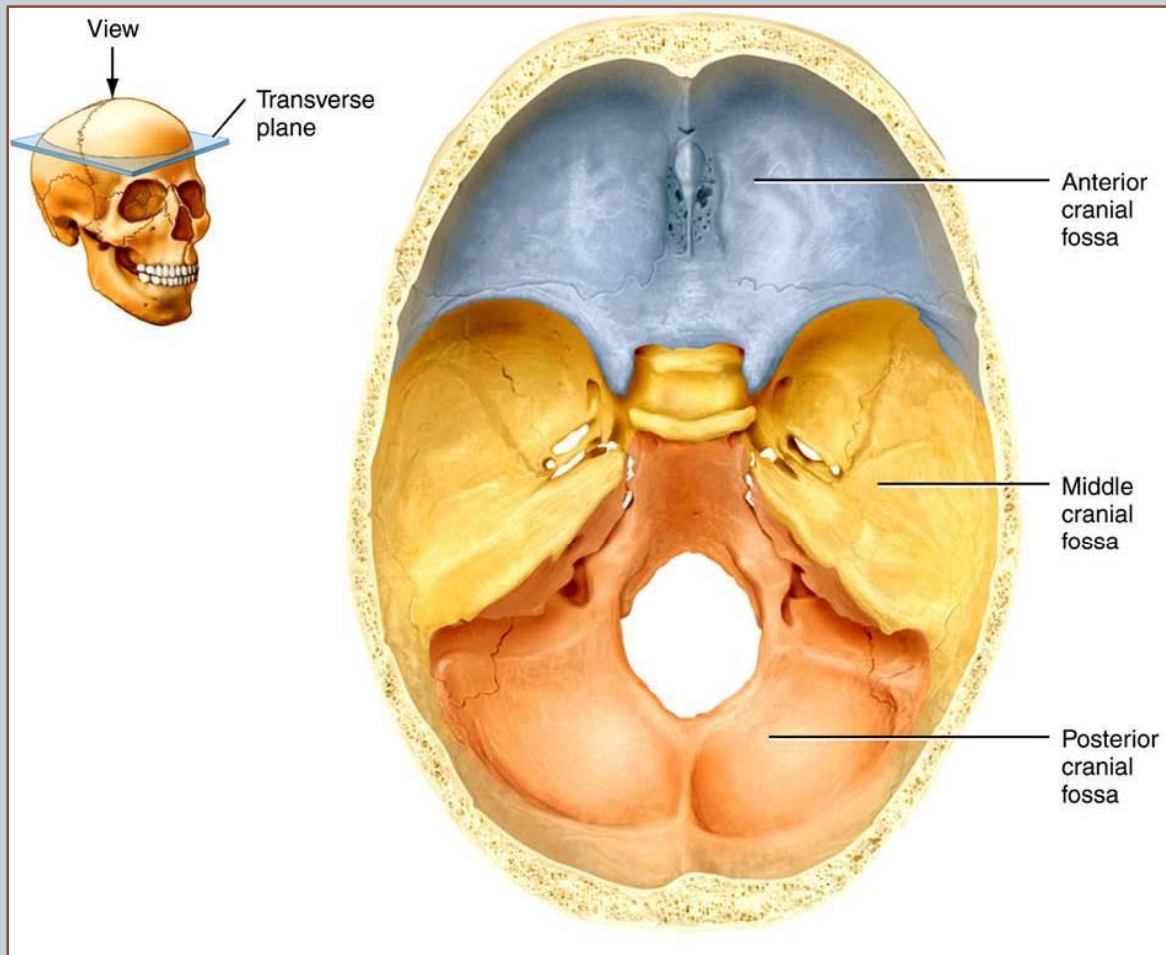


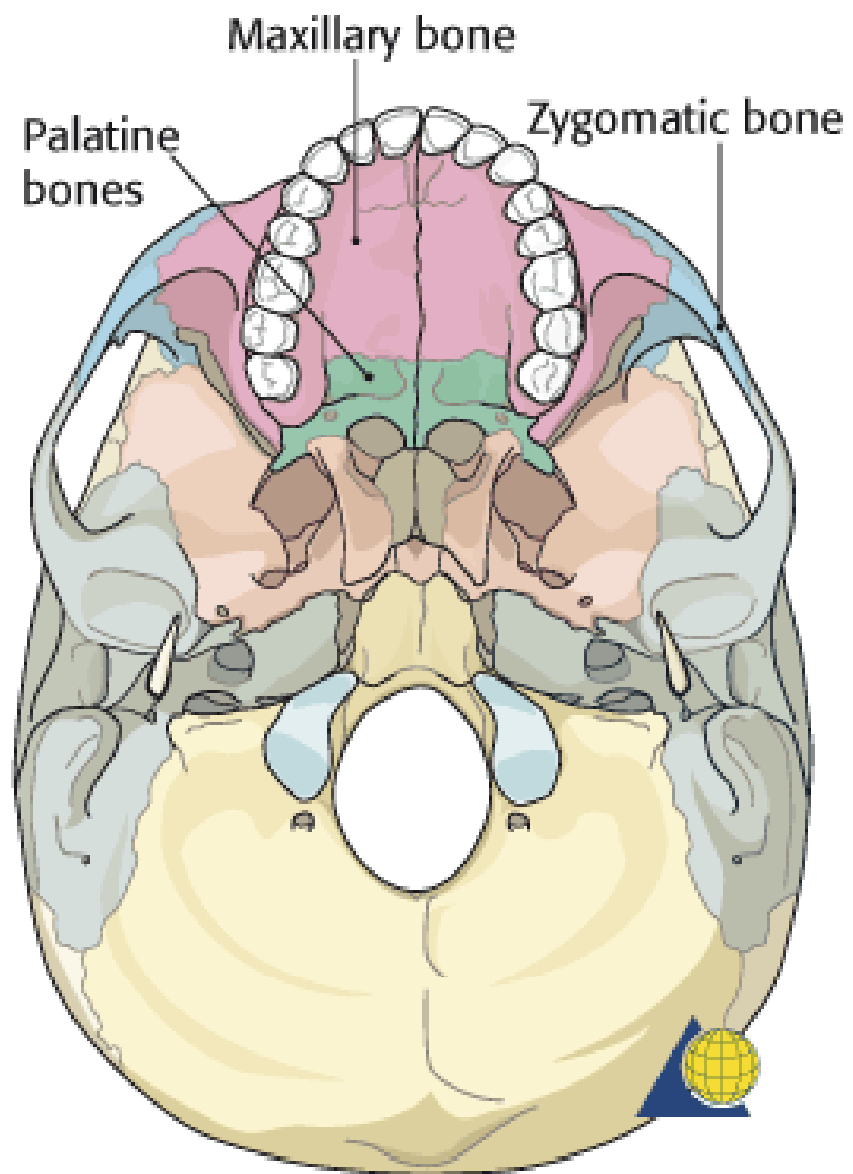
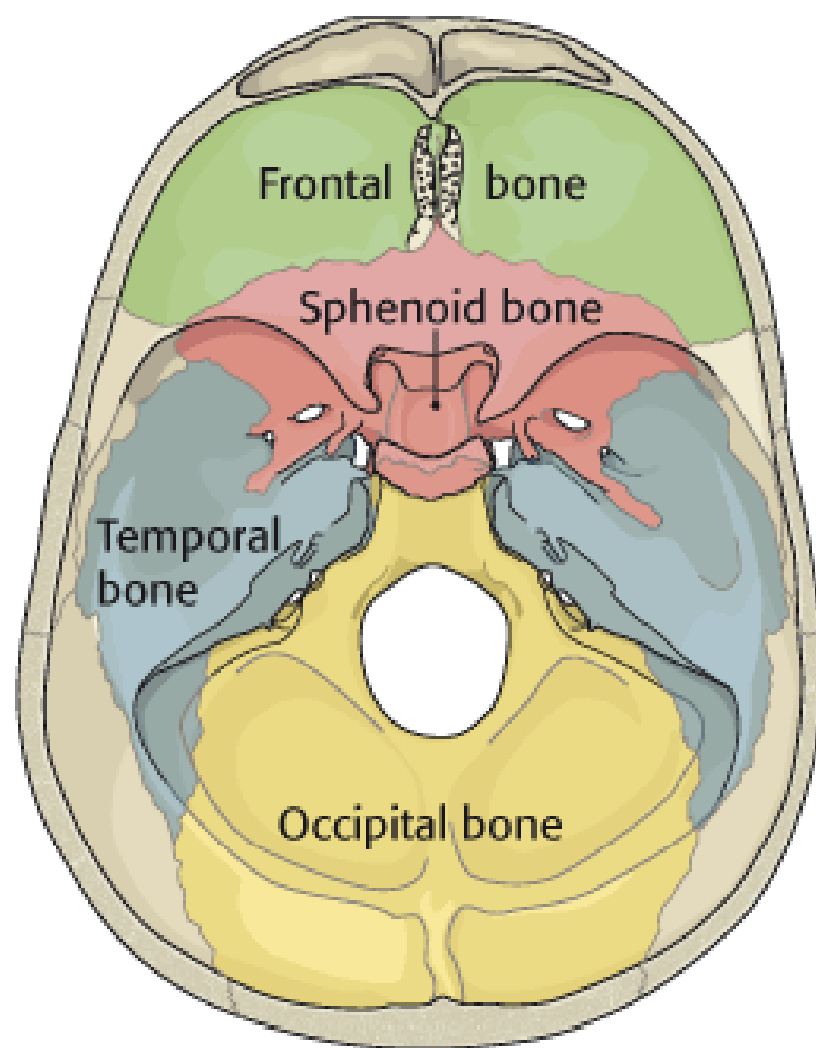
Base of skull

- Internal view
- External view

Fossa

1. Anterior cranial fossa
2. Middle cranial fossa
3. Posterior cranial fossa



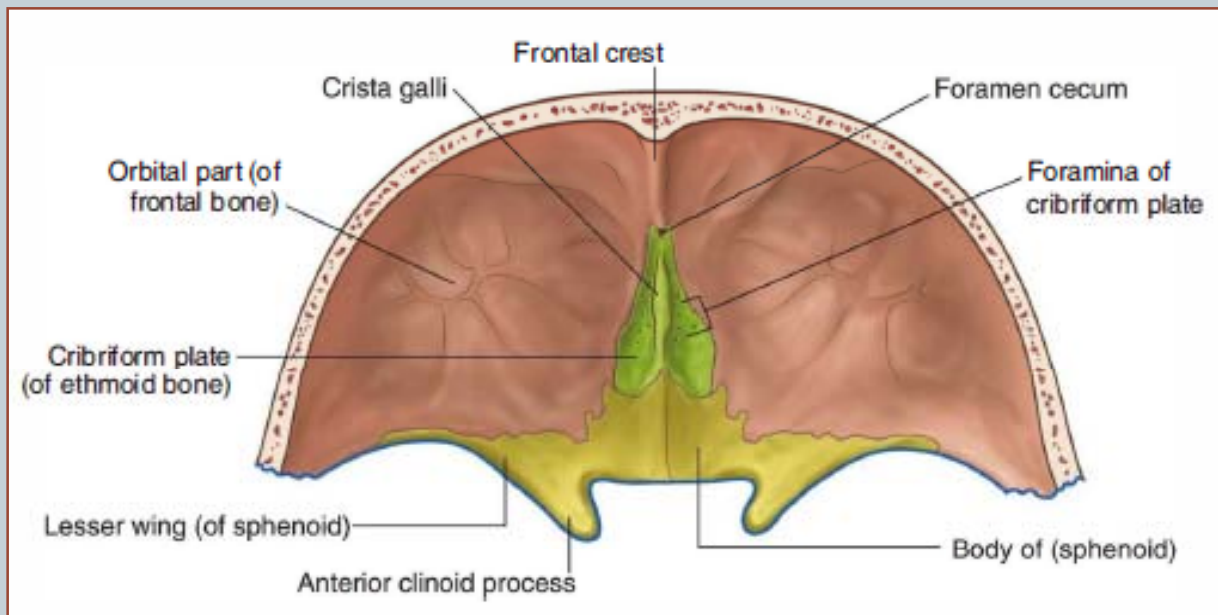


Anterior cranial fossa

- Anterior & lateral wall
Frontal bone

- Posterior border
Sphenoid lesser wing
Kiasmatic sulcus

Cribriform plate
Crista galli



Middle cranial fossa

- Deeper
- Anterior border
Sphenoid lesser wing
Kiasmatic sulcus
- Posterior border
Dorsum cella
Superior border of Petrous

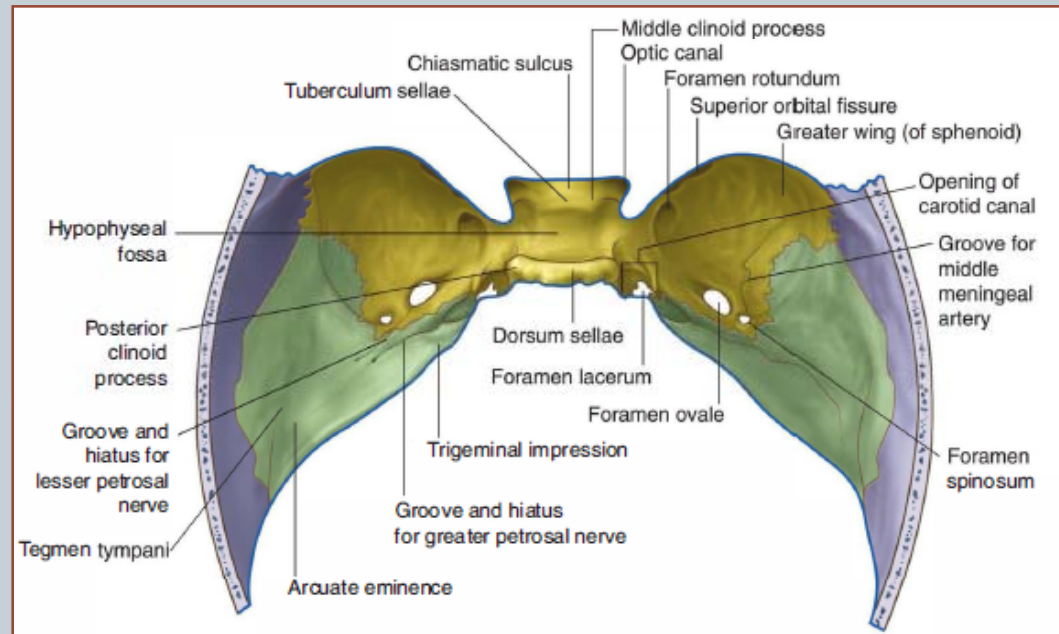
Sphenoid great wing
Round foramen (maxillary n.)
Oval foramen (mandibular n.)
Spinous foramen

Foramen lacerum
Between petrous apex & sphenoid body

Optic foramen (lesser wing & sphenoid body)
Optic n. & opthalmic A.

Superior orbital fissure
Between Lesser & great wings of sphenoid
3.4.6 nerve

Fracture (CSF & ear)



Posterior cranial fossa

- Deepest
- Anterior border
Dorsum sellae
Superior border of Petrous

- Posterior border
Squamous part of occipital

Clivus

Foramen magnum

Jugular foramen

Inferior occipital crest

Inferior occipital protuberance

Transverse sinus sulcus

