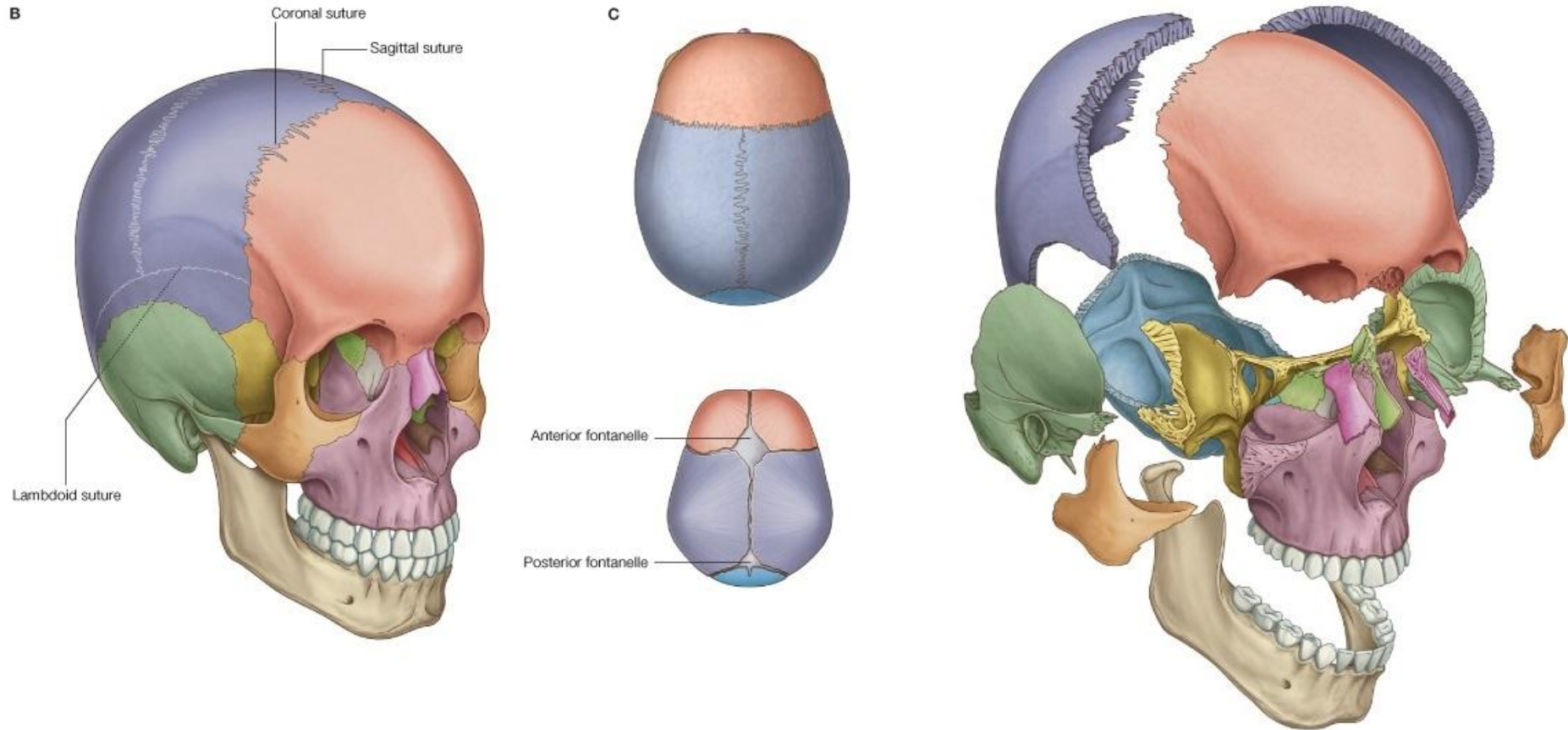


The Skull

Part I

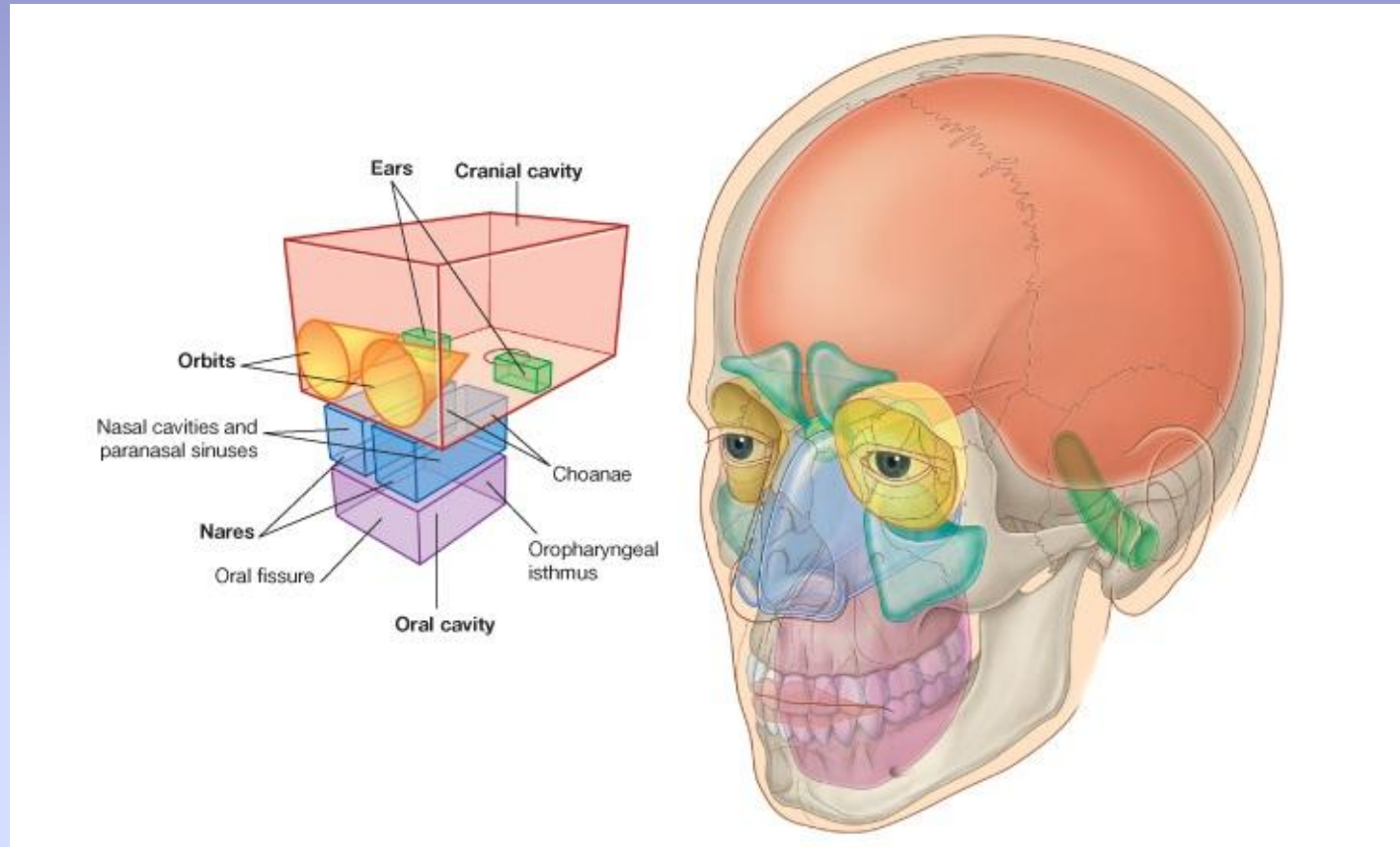
Raed Ogaili
M.Sc. Human Anatomy

The Skull

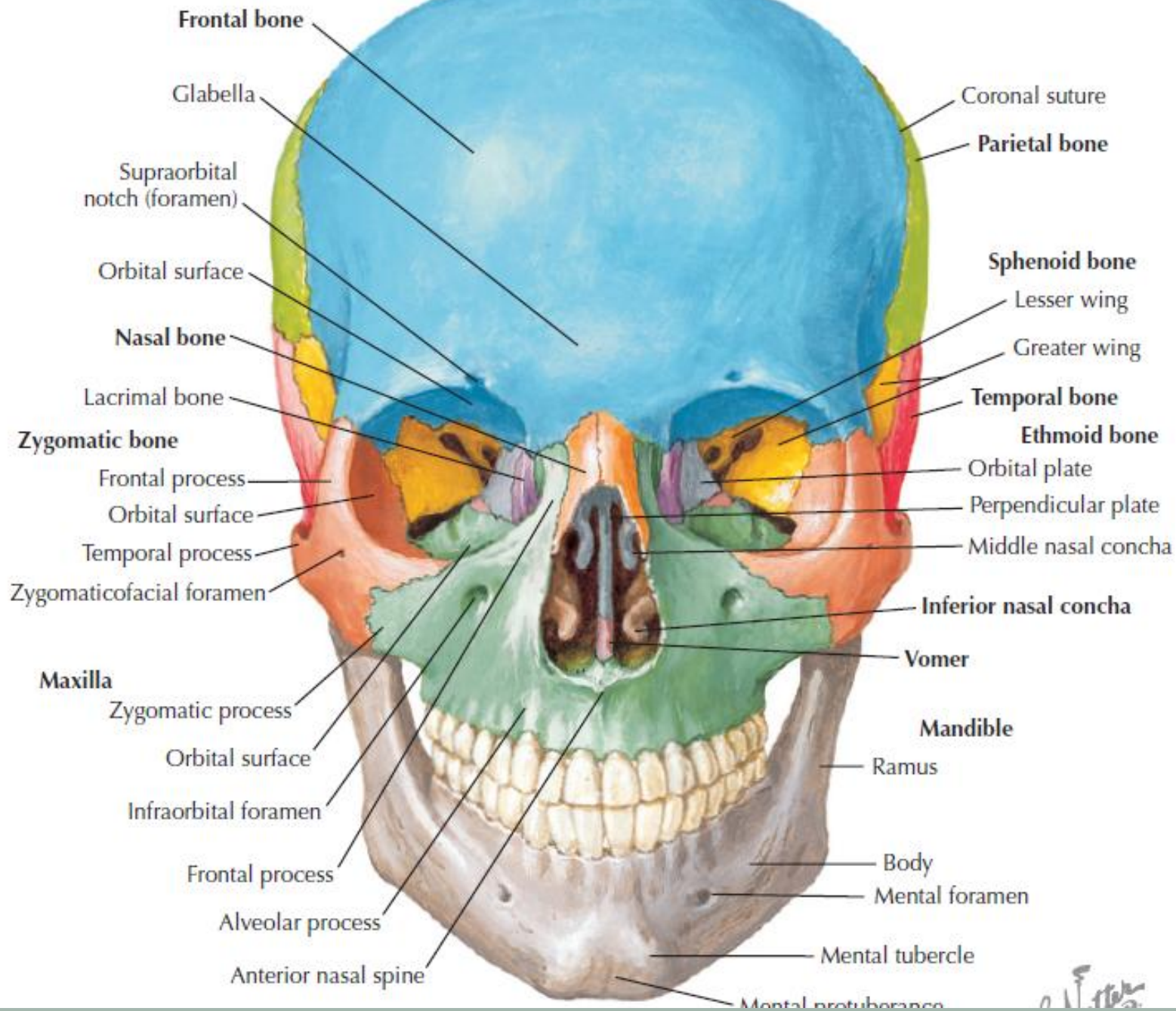


The **skull** is composed of several separate bones united by sutures except for the mandible that is united to the skull by temporo-mandibular joint.

The Function of Skull



The main function of the skull is that encloses and protect the **brain and meninges** in its cavity and the special senses (**eyes and ears**) within the skull bones or cavities bounded by them.



Divisions of Skull

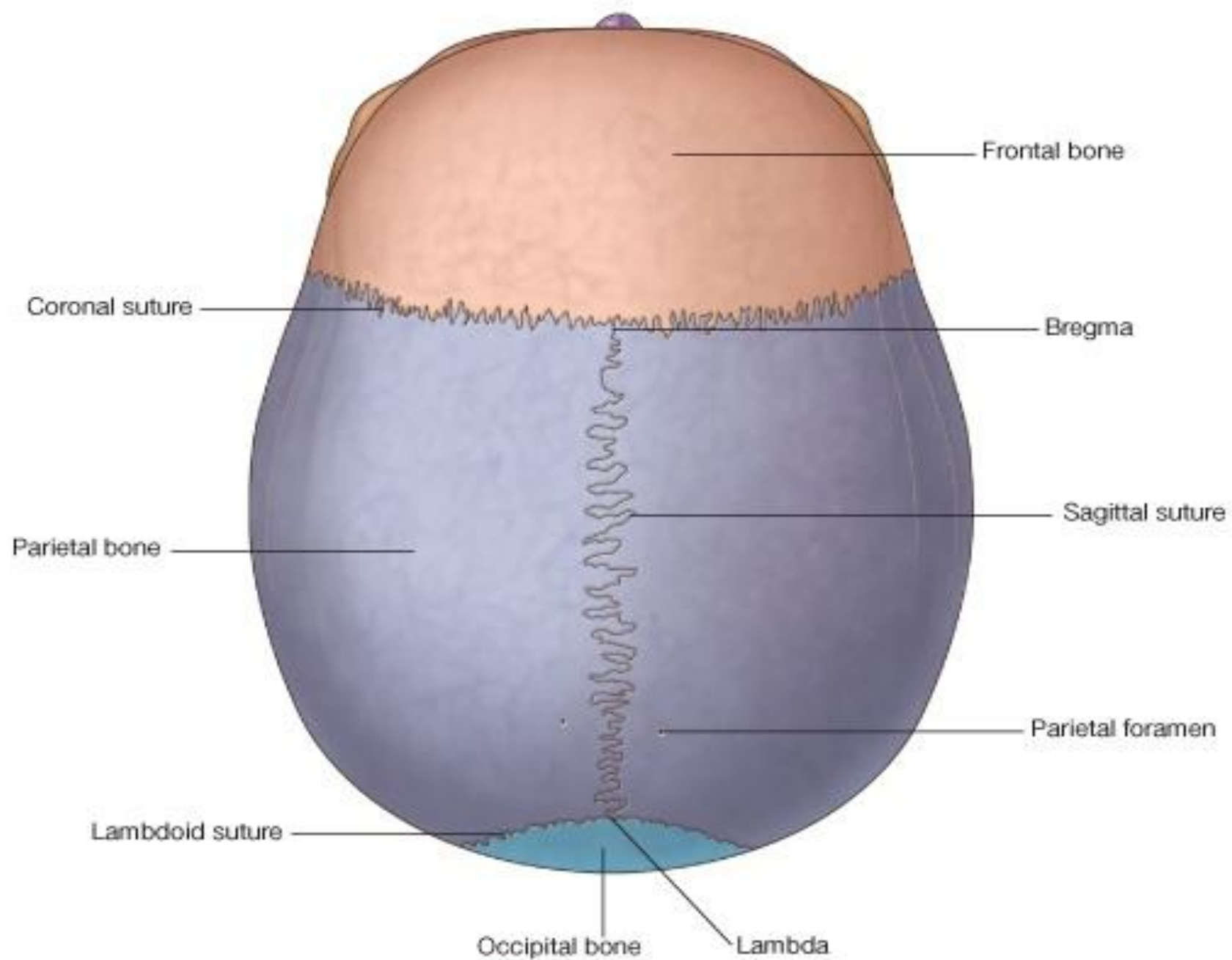
- 22 individual bones make up the skull:
 - 8 are paired
 - 6 are single
- Regionally, the skull is divided into the **mandible** (lower jaw) and **cranium** (skull without the mandible)
- The cranium consists of the following bones, two of which are paired
 - Frontal bone: 1
 - Parietal bones: 2
 - Occipital bone: 1
 - Temporal bones: 2
 - Sphenoid bone: 1
 - Ethmoid bone: 1

Divisions of Skull

- The **facial bones** consist of the following, two of which are single:
- Zygomatic bones: 2
- Maxillae: 2
- Nasal bones: 2
- Lacrimal bones: 2
- Vomer: 1
- Palatine bones: 2
- Inferior conchae: 2
- Mandible: 1

Divisions of Skull

- Skull is depicted by observing it from 5 views:
- ● Norma frontalis—the anterior view
- ● Norma lateralis—the lateral view
- ● Norma occipitalis—the posterior view
- ● Norma basalis—the inferior view
- ● Norma verticalis—the superior view



Sutures

- **Sutures:**

The sutures are fibrous joints uniting the bones of the skull.

- **Sutures Names? Examples?**

1- The Coronal suture: between frontal and the two parietal bones.(bregma/Lambda)

2- The Sagittal suture: between 2 parietal bones in midline.

3- The Lambdoid suture: between occipital bones posteriorly and the two parietal bones. Along the lambdoid suture small islands of bone (**sutural bones** or **wormian bones**)

Skull Landmarks:

Vertex: Superior point of neurocranium, when the skull is in the anatomical position.

Bregma: Point on calvaria at junction of coronal and sagittal sutures

Lambda: Point on calvaria at junction of lambdoid and sagittal sutures

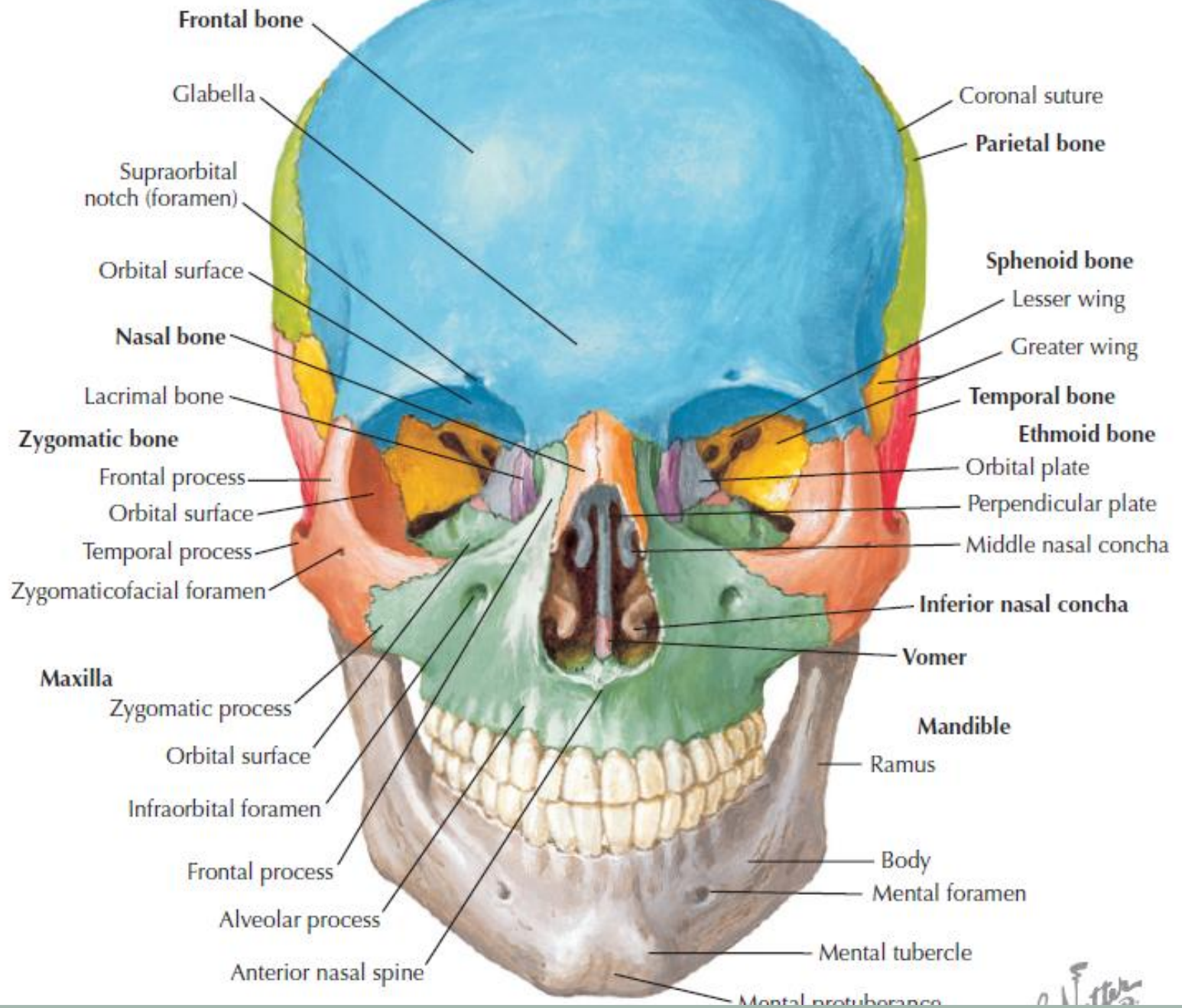
Glabella: Smooth prominence; most marked in males; between the eyebrows and above the nose.

Nasion: Point on cranium where frontonasal and internasal sutures meet

Inion: Most prominent point of external occipital protuberance

Pterion: H shape Junction of the greater wing of the sphenoid, squamous temporal, frontal, and parietal bones; overlies course of anterior division of middle meningeal artery

Asterion: Star shaped; located at junction of three sutures: parietomastoid, occipitomastoid, and lambdoid



Bone	Single	Paired	Articulates with
Frontal	X		Parietal, sphenoid, zygomatic, maxilla, ethmoid, nasal, lacrimal
Parietal		X	Frontal, parietal, temporal, occipital, sphenoid
Temporal		X	Parietal, occipital, sphenoid, zygomatic, mandible
Occipital	X		Parietal, temporal, sphenoid, and atlas (C1)
Sphenoid	X		Frontal, parietal, temporal, occipital, zygomatic, maxilla, ethmoid, palatine, vomer
Zygomatic		X	Frontal, temporal, maxilla
Maxilla		X	Frontal, sphenoid, zygomatic, maxilla, ethmoid, palatine, vomer, nasal, lacrimal, inferior nasal concha
Ethmoid	X		Frontal, sphenoid, maxilla, palatine, vomer, nasal, lacrimal, inferior nasal concha
Palatine		X	Sphenoid, maxilla, ethmoid, palatine, vomer, inferior nasal concha
Vomer	X		Sphenoid, maxilla, ethmoid, palatine
Nasal		X	Frontal, maxilla, nasal
Lacrimal		X	Frontal, maxilla, ethmoid, inferior nasal concha
Inferior nasal concha		X	Maxilla, ethmoid, palatine, lacrimal
Mandible	X		Temporal

Frontal Bone: (Forehead Bone)

- Forms: Forehead, superior orbital margin and orbital roof.

- **Squamous portion**

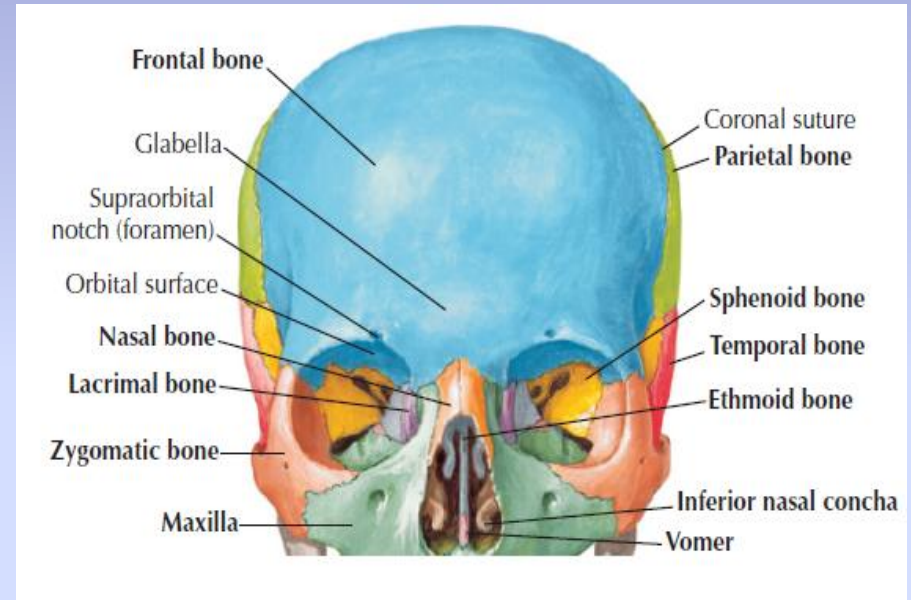
The largest part of the frontal bone

- **Orbital portion**

Forms the roof of the orbit and floor of the anterior cranial fossa

- **Nasal portion**

Articulates with the nasal bones and the frontal process of the maxilla to form the root of the nose



Parietal Bone

Forms: cranial roof and sides

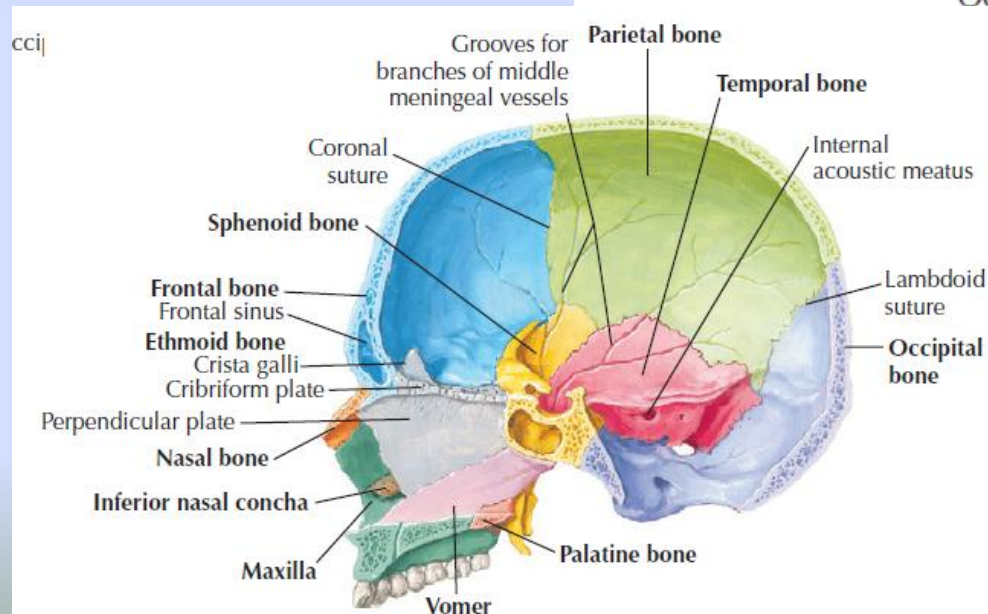
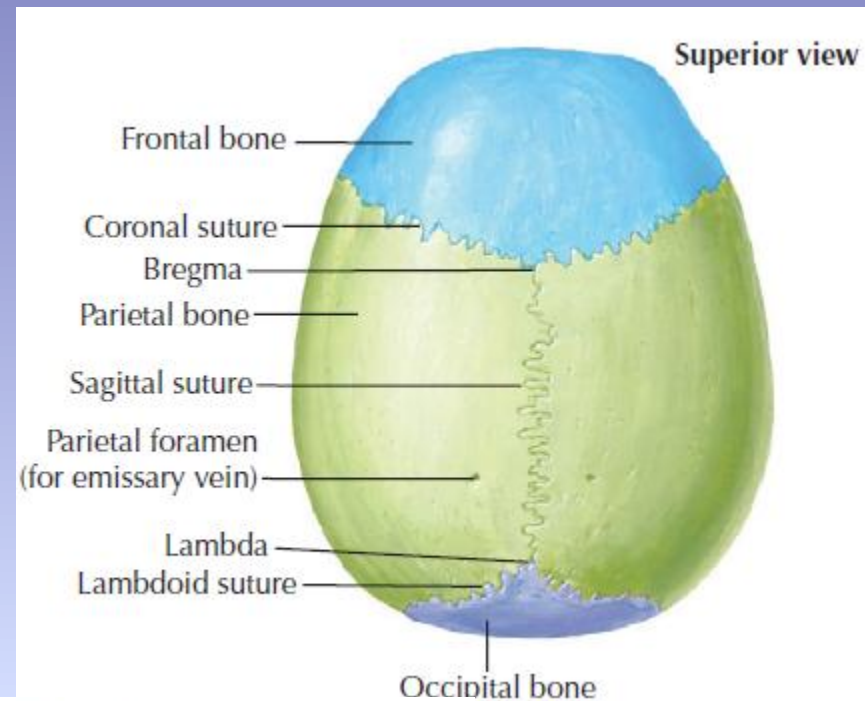
- Parts
- has 4 angles.

Frontal

Sphenoid

Occipital

Mastoid



Occipital Bone

Forms: Base of the skull

Has 3 Parts

- Squamous

(foramen magnum)

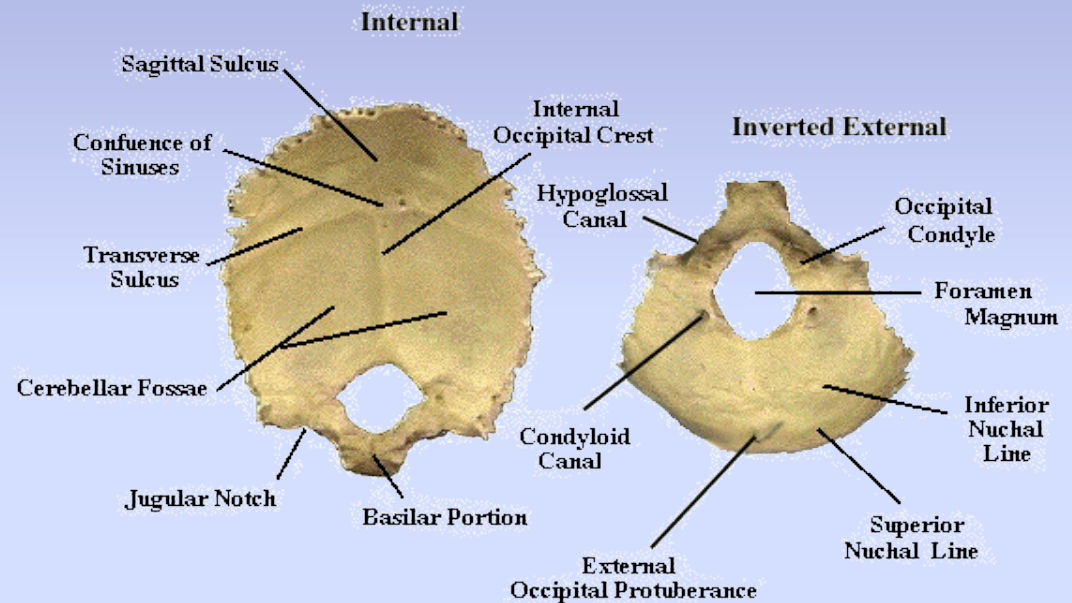
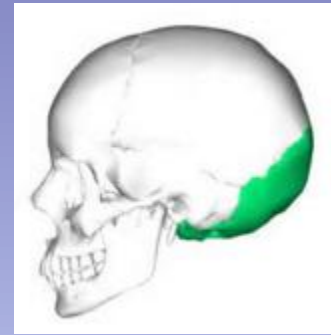
- Lateral

Lateral to FM

- Basilar

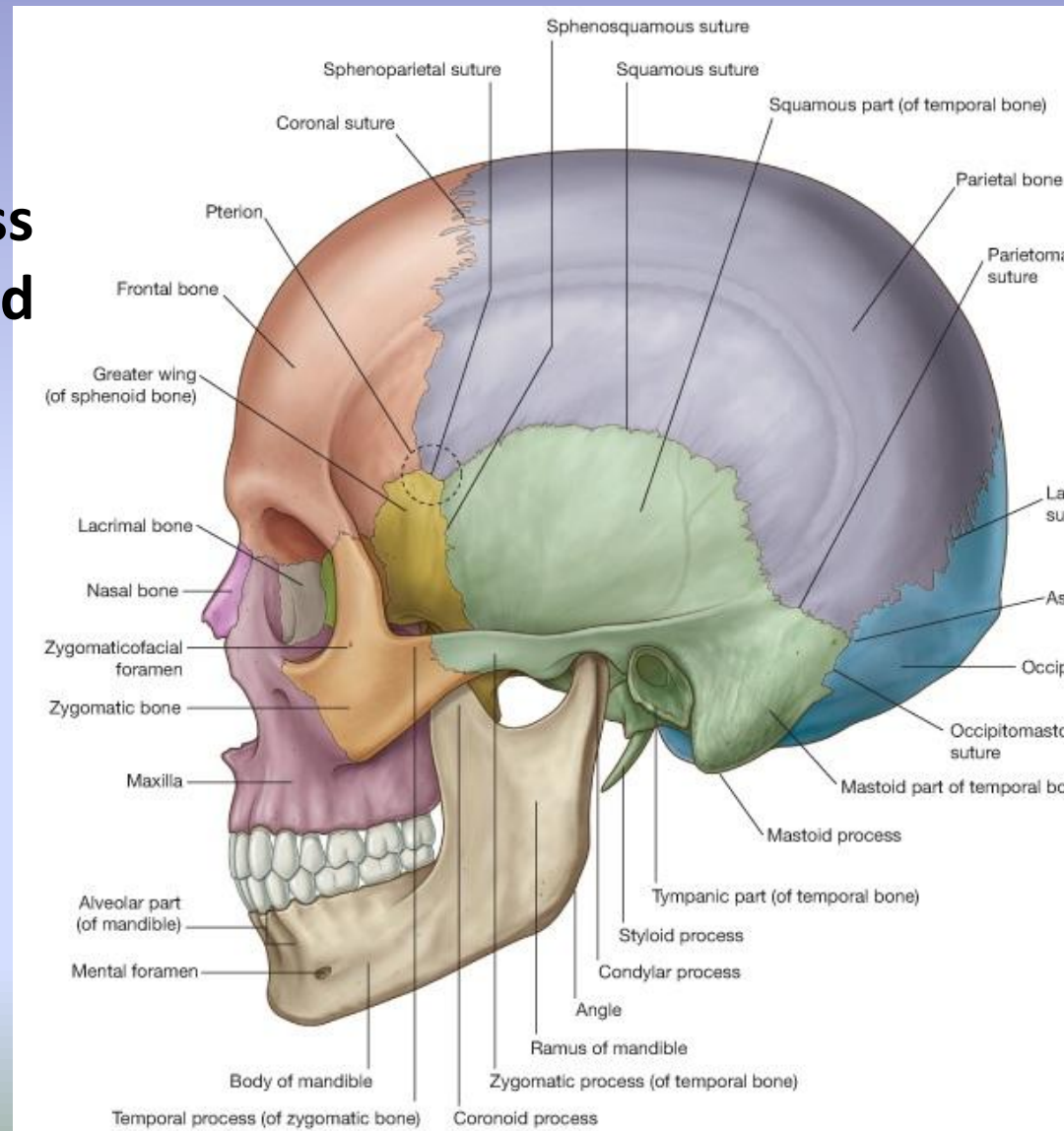
- Anterior to FM

- Pharyngeal tubercle



Temporal Bone

- **Forms:** Lateral cranial wall
- **Contents:** 4 parts, 3 process
Squamous, tympanic, mastoid & petrous
- **Landmarks:**
- **Foramens:** carotid canal, jugular, stylo-mastoid, foramen lacerum, ext & internal Acoustic meatus,
- **Articulations:?**

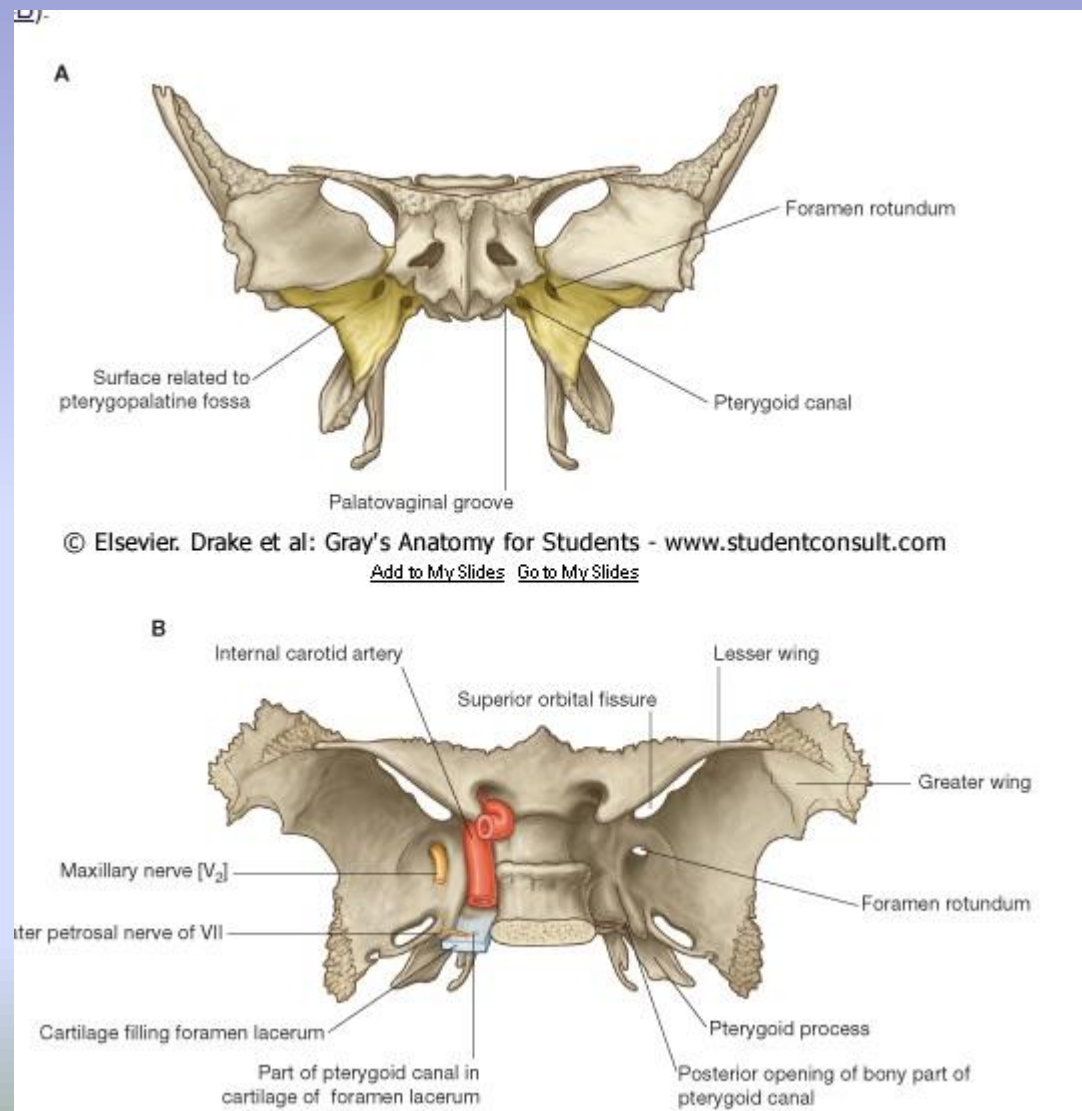


Sphenoid Bone

- **Forms:** orbital wall, temporal fossa wall, base of skull
- **Contents:** sphenoid sinus

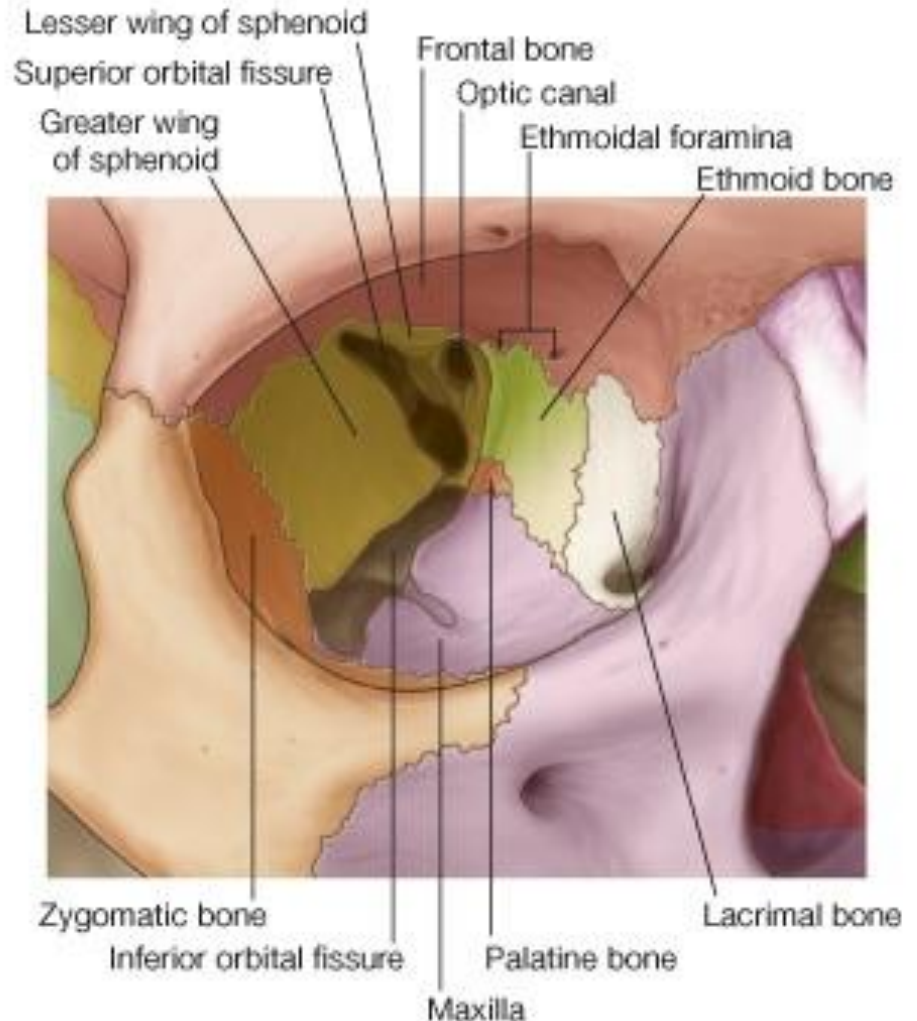
4 wings (lesser, greater), body, 2 Pterygoid Processes.

- **Landmarks:**
- **Foramens:** G. wing = foramen ovale & spinosum
- **Articulations:**



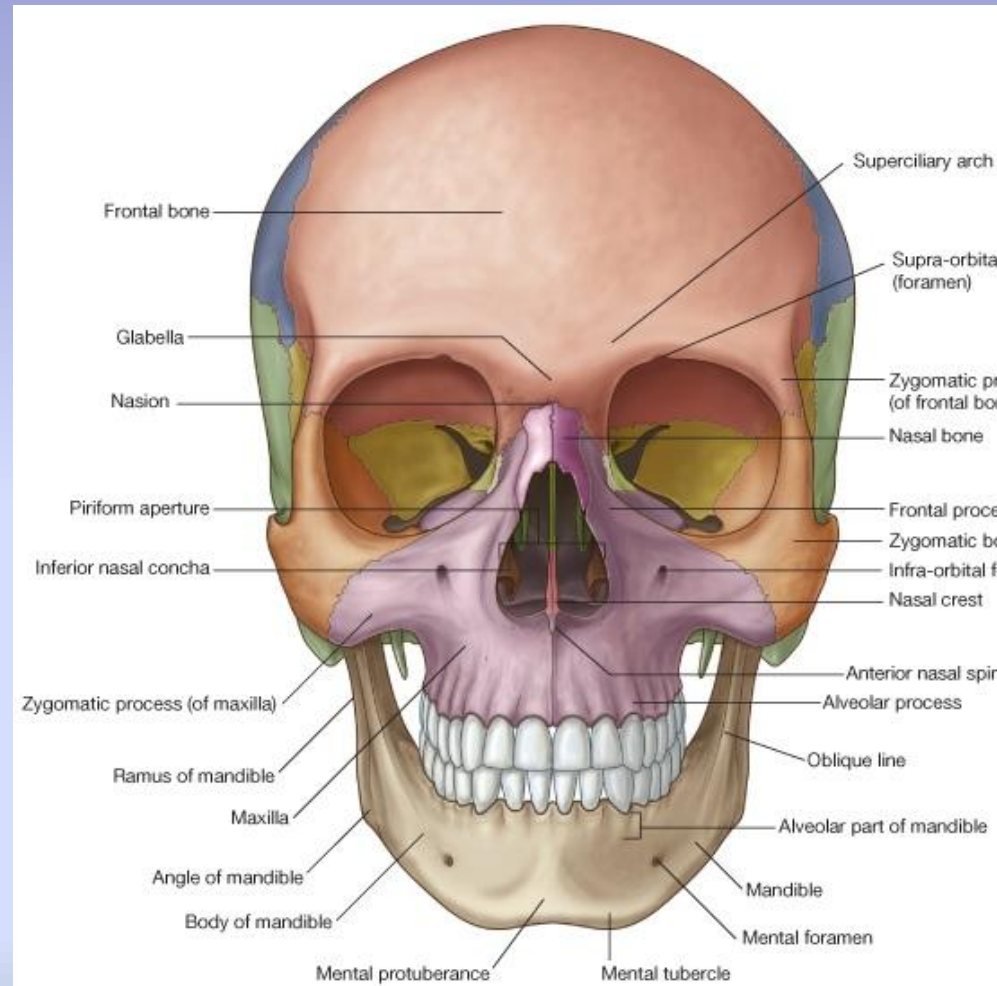
Lacrimal Bone

- **Forms:** Post crest of Lacrimal canal, medial wall of orbit
- **Contents:** smallest?
- **Landmarks:** Post. Lacrimal Crest
- **Foramens:** nasolacrimal canal
- **Articulations:?**



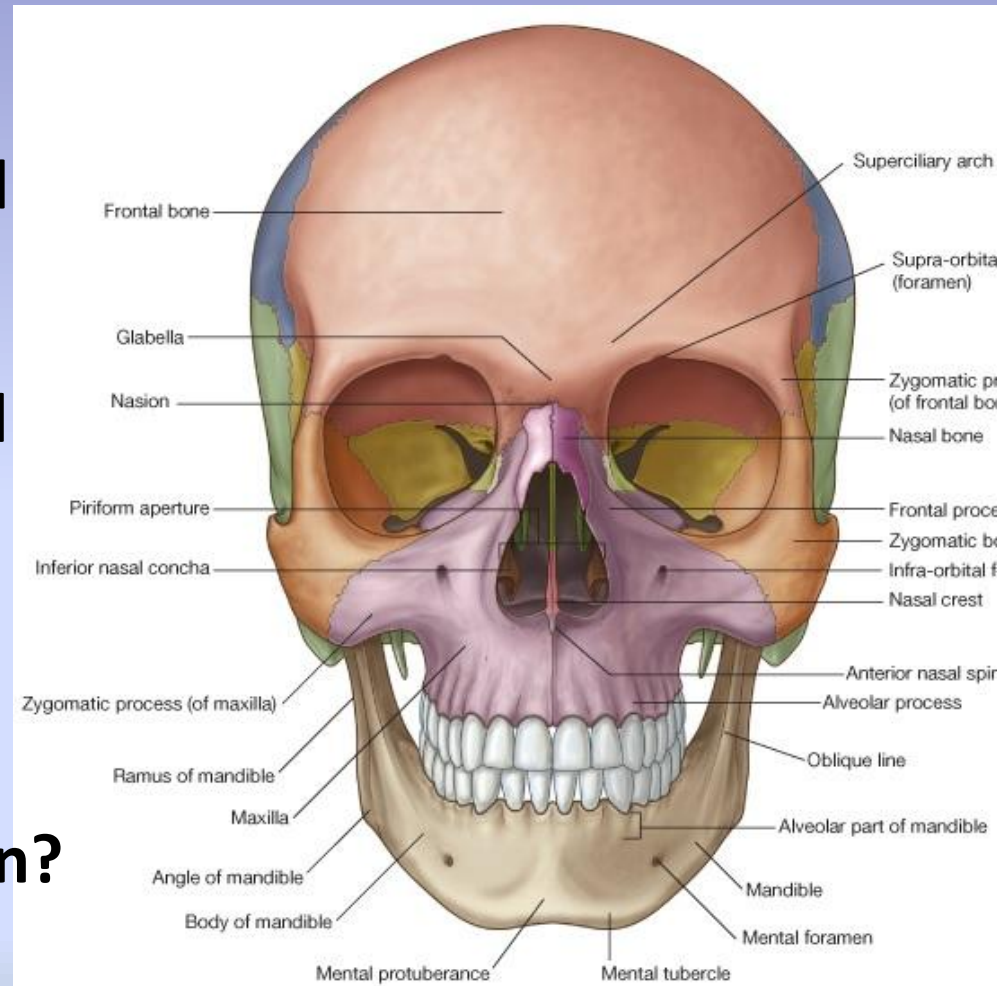
The Nasal Bone

- **Forms:** nasal bridge, sup. Border of Piriform aperture
- **Contents:**
- **Landmarks:**
- **Foramens:** Nasal foramen.
- **Articulations:** internasal suture, frontonasal suture



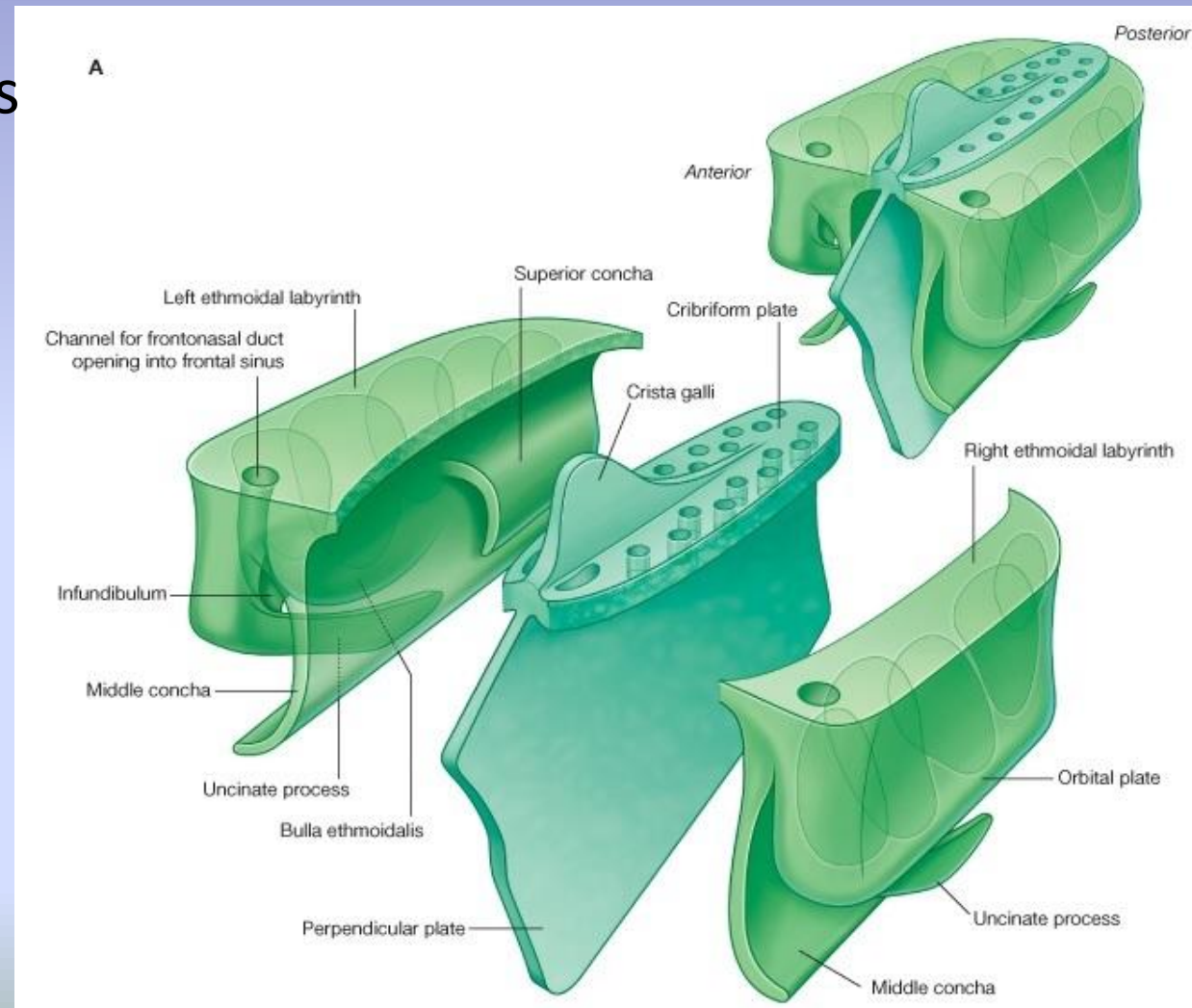
Zygomatic Bone

- **Forms:** prominence of a cheek, floor & lateral wall of the orbit, the walls of the temporal and infratemporal fossae, and **zygomatic arch**
- **Contents:**No Sinus
- **Landmarks:** ?
- **Foramens:** zygomaticofacial foramen?
- **Articulations:**?



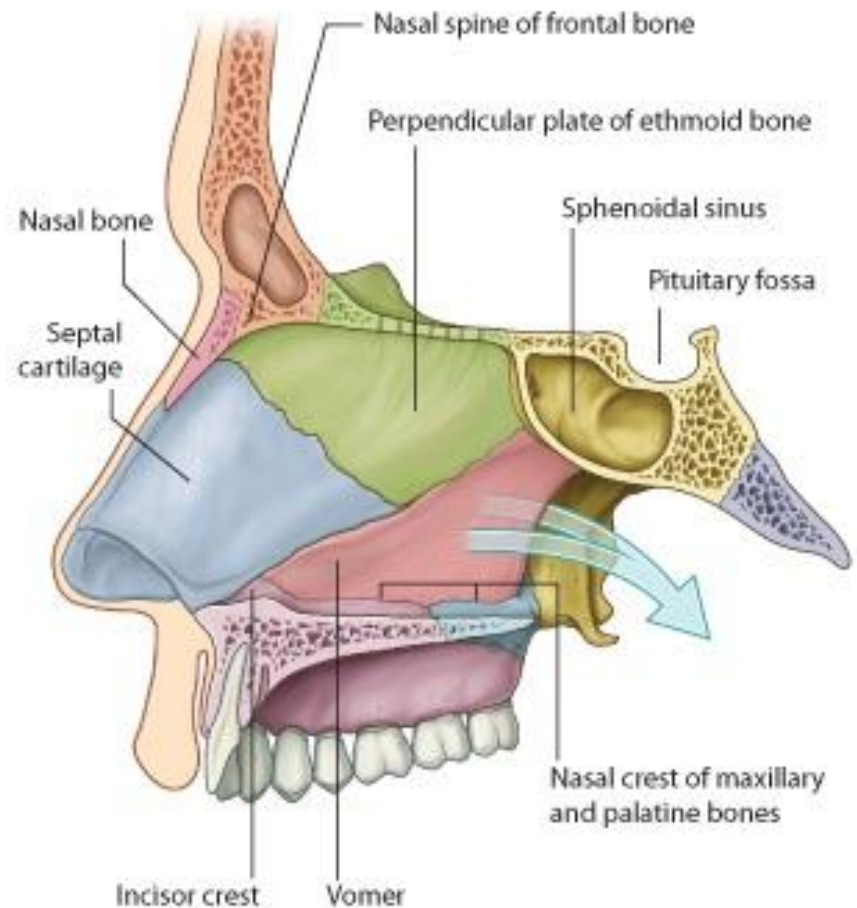
Ethmoid Bone

- **Forms:** medial walls of the orbit, nasal septum and the roof & lateral walls of the nasal cavity.
- **Contents:** 2 plates and 2 labryinths
- **Landmarks:** Crista Galli,
- **Foramens:** ?
- **Articulations:?**



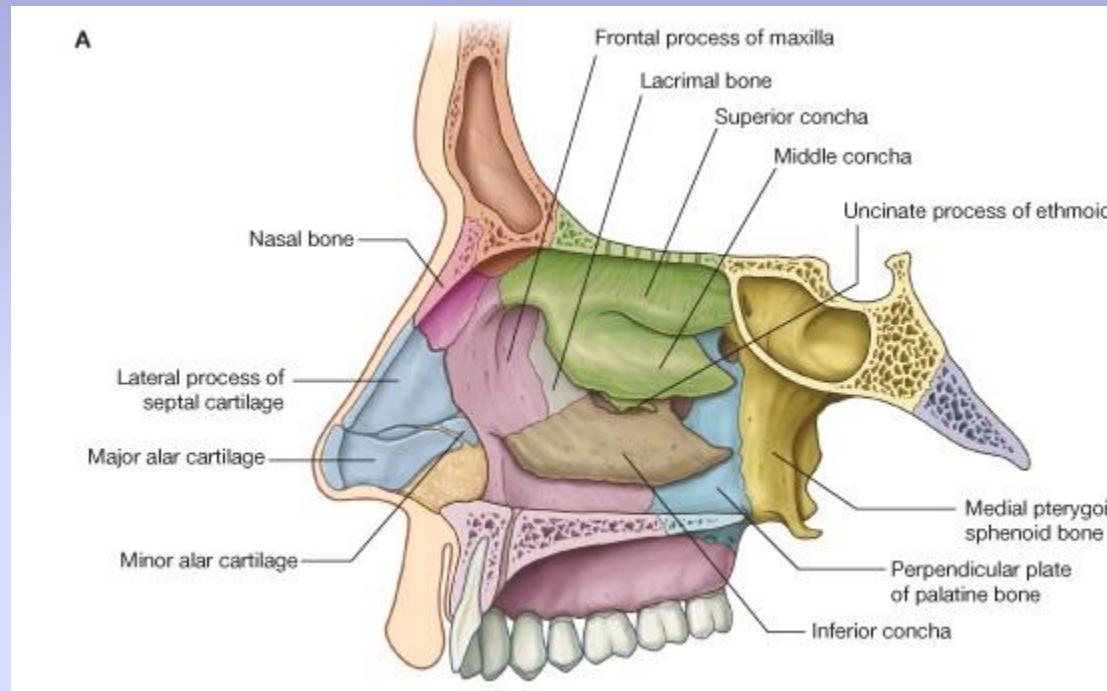
Vomer

- **Forms:** posteroinferior part of the nasal septum
- **Articulations:**
 1. Superiorly - sphenoid bone and sphenoidal processes of the palatine bones.
 2. Inferiorly - nasal crests of the maxilla and palatine bones.
 3. Anteriorly - perpendicular plate of the ethmoid bone and the nasal septal cartilage.
 4. Posteriorly – No ??



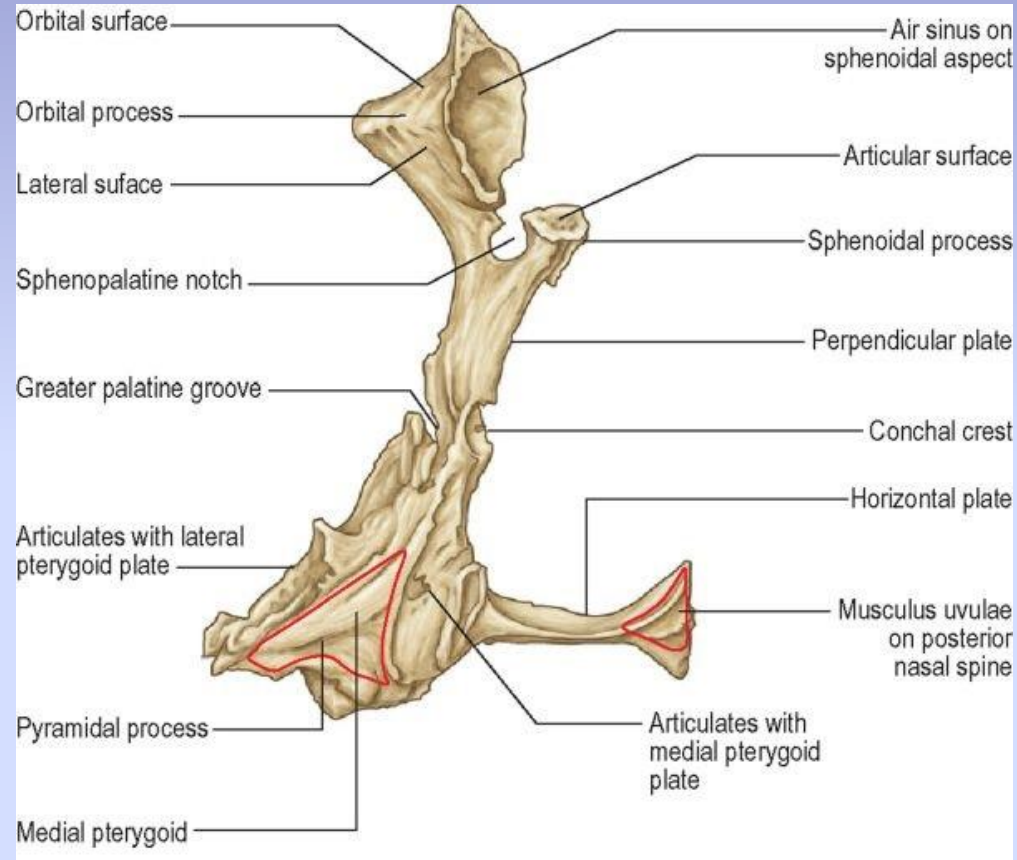
Inferior Nasal Concha

- **Forms:** Lateral nasal wall
- **Contents:?**
- **Landmarks: ?**
- **Foramens:** inferior Meatus
- **Articulations:**



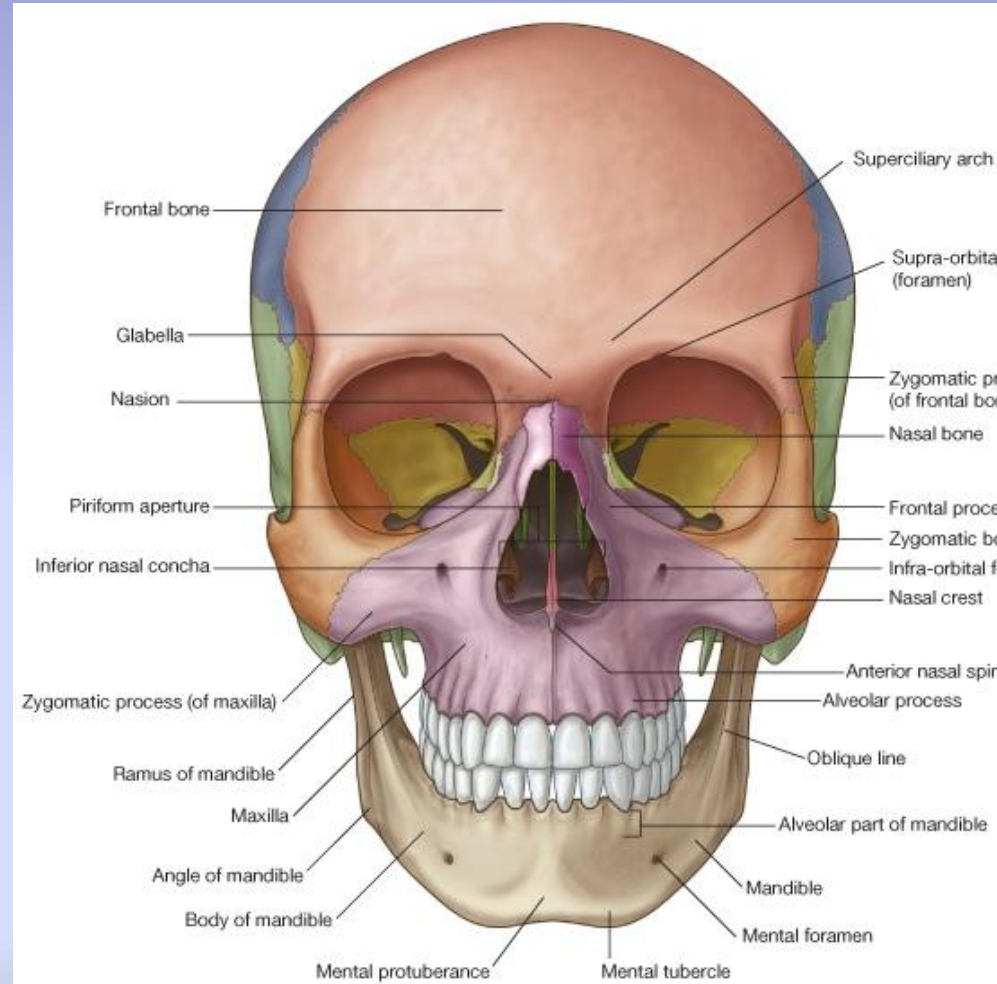
Palatine Bone

- **Forms:** roof of mouth, nasal wall
- **Contents:** 2 plates (L shape) 3 processes
- **Landmarks:**
- **Foramens:** greater and lesser palatine foramens
- **Articulations:** interpalatine suture, Maxillary bone?,



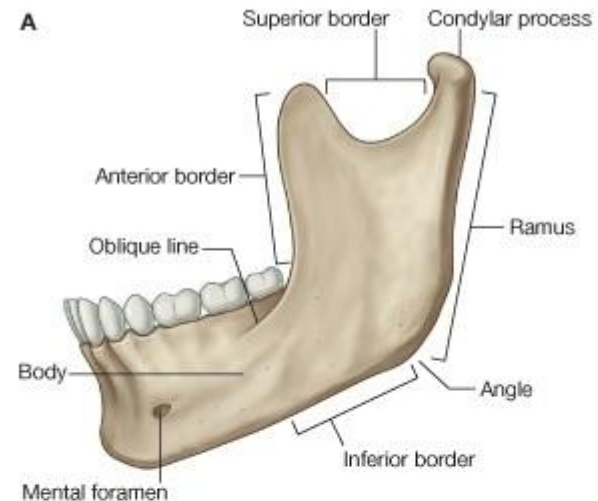
Maxillary Bone

- **Forms:** upper jaw, floor of orbit, nasolacrimal canal, floor of mouth
- **Contents:** Maxillary Sinuses
- surround **piriform aperture**
- **Landmarks:** Alveolar process, intermaxillary suture
- **Foramens:** infraorbital foramen. Transmits?
- **Articulations?**

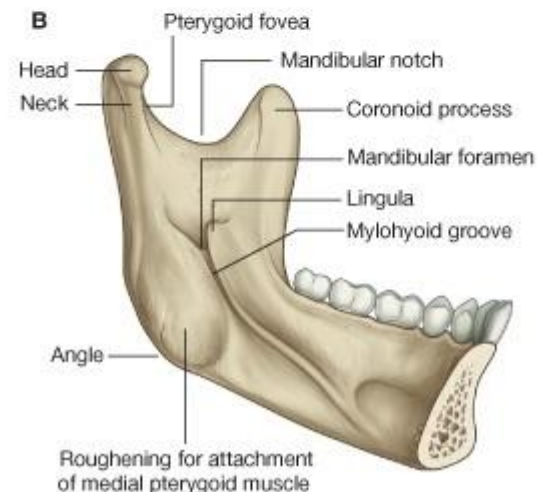


The Mandible

- Forms: the lower jaw and supports the teeth
- Contents: Horizontal **body of mandible** and Vertical **ramus of mandible**
- Landmarks: **mental protuberance (Chin)** , **mental tubercles**.
- **Foramens: mental foramen:**
- **The Ramus Has :**
 - 1- **Condylar Process**
 - 2- **Coronoid Process**



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The Anterior Orbital Opening

- Superiorly by frontal bone
- Inferiorly by Maxillary bone
- Laterally by frontal process of Zygomatic bone and Zygomatic process of frontal bone
- Medially by frontal process of Maxillary bone and Maxillary process of Frontal bone.

