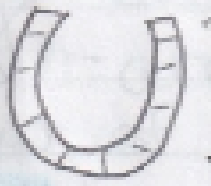
Brachial Skeleton

Shark Jaws

} Derived from first arch (mandibular arch ①)

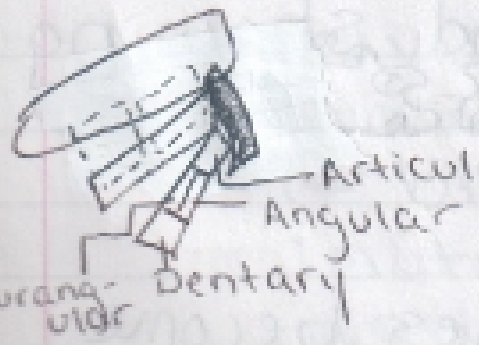
hyomandibular cartilage: braces jaw at otic capsule; aka hyostylic jaw suspension

} Hyoid Arch ②

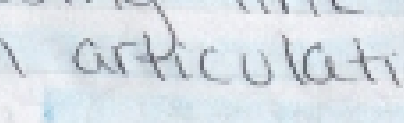


} Pharyngeal Arch ③

- Sharks have hyostylic jaw suspension: condition where the hyoid serves to support the jaws
- Bony Fish
  - develop dermal bones that attach brain case with palatoquadrate
  - posterior cartilage of palatoquadrate ossifies and becomes articular bone
  - hyomandibular cartilage remains in most so they still have hyostylic jaw
  - Development of the Surangular, Dentary, Angular, and Articular Bones (Dermal) replace Meckel's Cartilage
  - Quadrate in upper jaw becomes its own bone and the beginning of upper jaw to fuse to braincase



Tetrapod Jaws / Hyoid Arches
- Gill arches reduce and disappear; become hyoid bone and cartilage of larynx

Mammals
- palatoquadrate develops similarly in all tetrapods except mammals who have a loss of the quadrate bone which moves to the inner ear and becomes the incus
- have autostylic jaw suspension:
  - first seen in lungfish; hyomandibular cartilage incorporated into the otic capsule as the columella / stapes which is the first ear ossicle
  - lungfish, amphibians, reptiles, birds, and mammals all have autostylic jaw
  - VERY IMPORTANT! → Articular-Quadrate Jaw Articulation
- Dentary Bone in Mammals expands with presence of temporal fenestra; grow ramous to add more muscles
- Angular and Surangular swallowed up; articular moves into otic capsule to become malleus (part of inner ear ossicle)
- Mammals have Dentary-Squamosal articulation as opposed to quadrate-articular
  - missing-link fossil found showing both articulations → 

In Tetrapods
- 2nd and subsequent gill arches become hyoid bone and the larynx
  - used to attach muscles of the tongue and w/ larynx during swallowing

- in Crocodylians / some lizards, clavicle lost all together

- Mammals
  - clavicle persists, coracoid fuses with scapula
  - big clavicles
  - disappears in cetaceans, ungulates, subungulates and some carnivores
  - cats clavicle ossified, dogs cartilaginous
  - can run faster and use muscles in a different way
  - coracoid process with scapula
  - scapula has spine that serves as muscle attachment