

Biology 3B Laboratory
Comparative Anatomy of the Vertebrate Skeletal Systems

Shark (Dogfish – *Squalus*):

- chondrocranium
- rostrum
- nasal capsules
- ethmoid plate
- orbital plates
- otic capsules
- foramen magnum
- occipital condyles
- visceral arches
- palatoquadrate
- mandibular (Meckel's) cartilage
- hyomandibular
- ceratohyal
- epibranchial
- branchial arches
- heterocercal tail

Bony Fish (*Amia*)

- dermatocranium
- nasal
- frontal
- postorbital
- parietal
- maxillary
- dentary
- angular
- quadrate
- operculum

Bony Fish (Perch, *Perca* and the others)

- nasal
- frontal
- parietal
- pre-maxilla
- maxilla
- dentary
- articular
- quadrate
- hyomandibular
- operculum

- neural spine
- neural arch
- epipleural ribs
- pleural ribs
- haemal arch
- haemal spine
- actinotrichia
- lepidotrichia
- pterygiophores
- homocercal tail
- pectoral and pelvic girdles and fins

Amphibian (mud puppy – *Necturus*)

- quadrate
- squamosal
- premaxilla
- frontal
- dentary
- angular
- cervical vertebrae
- trunk vertebrae
- sacral vertebrae
- caudal vertebrae
- postzygapophysis
- prezygapophysis
- pectoral and pelvic girdles
- humerus
- radius
- ulna
- femur
- tibia
- ibula

Amphibian (frog – *Rana catesbiena*)

- hyoid apparatus
- premaxilla
- maxilla

- nasal
- frontal-parietal
- pterygoid
- squamosal
- quadratojugal
- dentary
- vomer
- 9 vertebrae
- atlas
- sacral vertebra
- urostyle
- suprascapula
- scapula
- clavicle
- coracoid
- humerus
- radioulna
- carpals
- metacarpals
- phalanges
- ilium
- pubis
- ischium
- femur
- tibiofibula
- tarsals
- calcaneus
- astragalus
- metatarsals
- phalanges

Reptiles (Testudines – Sea Turtle & Snapping Turtle)

- premaxilla
- prefrontal
- frontal
- postorbital
- parietal
- squamosal
- supraoccipital
- quadratojugal
- quadrate
- exoccipital
- basioccipital

- supraoccipital
- opistotic
- prootic
- dentary (anterior portion)
- angular (posterior & medial) and
- surangular (posterior & lateral) and one endochondral bone, the
- articular
- plastron
- clavicles
- interclavicle
- carapace
- ribs.
- scapula
- acromion process
- coracoid
- ilium
- pubis
- ischium
- femur,
- tibia,
- fibula
- tarsals
- humerus
- radius
- ulna
- carpals

Reptiles (Lepidosauria – Squamata – Serpentes – snakes)

- diapsid skull
- caudal vertebra
- atlas
- ribs
- zygosphenes
- zygantra
- ball & socket articulation

Birds (Aves – chicken and pigeon)

- synsacrum
- pygostyle
- uncinat processes
- sternum

- carina
- coracoids
- scapula
- clavicles
- interclavicle
- furcula
- foramen triosseum
- humerus
- radius
- ulna
- carpometacarpus
- ischium
- femur
- tibia
- fibula
- tarsometatarsus
- frontal
- parietal
- premaxilla
- maxilla
- jugal
- quadrate
- dentary

Mammals (Cat & Human)

- sutures
- heterodont dentition
- incisors
- premolars
- molars
- canines
- carnassials
- diastema
- frontal
- parietal
- nasal
- maxilla
- premaxilla
- palatine

- dentary
- temporal
- zygomatic
- occipital
- foramen magnum
- occipital condyle
- internal nares
- tympanic bulla
- external auditory meatus
- mastoid process
- zygomatic arch
- cervical vertebrae
- atlas
- axis
- spinous process
- transverse processes
- vertebral foramen
- thoracic vertebrae
- ribs
- lumbar vertebrae
- sacral vertebrae
- sacrum
- acetabulum
- ilium
- ischium
- pubis
- obturator foramen
- caudal vertebrae
- coccyx
- sternum
- manubrium
- xiphisternum
- costal cartilage
- scapula
- clavicle
- humerus
- radius
- ulna
- olecranon process
- carpals
- metacarpals
- ilium
- ischium
- pubis

- femur
- patella
- tibia
- fibula
- tarsals
- calcaneus
- metatarsals
- phalanges
- scapulacoracoid process
- acromion process
- scapular spine

**cursorial locomotion
stance or foot fall type**

- plantigrade
- digitigrade
- unguligrade