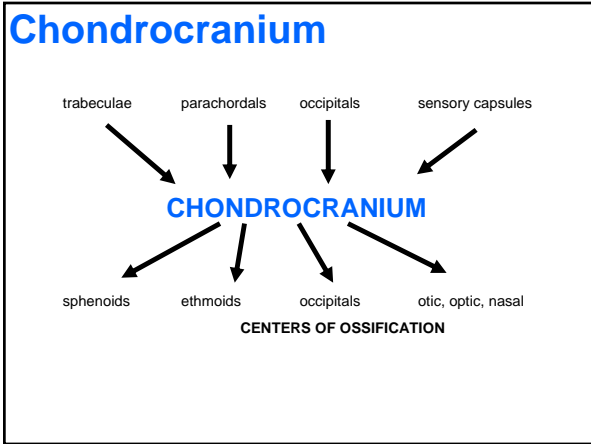
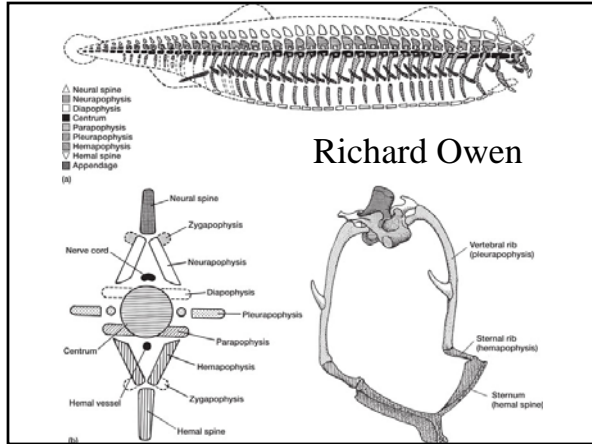
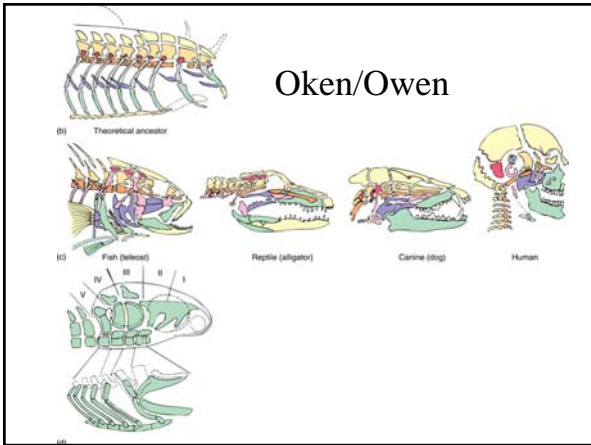
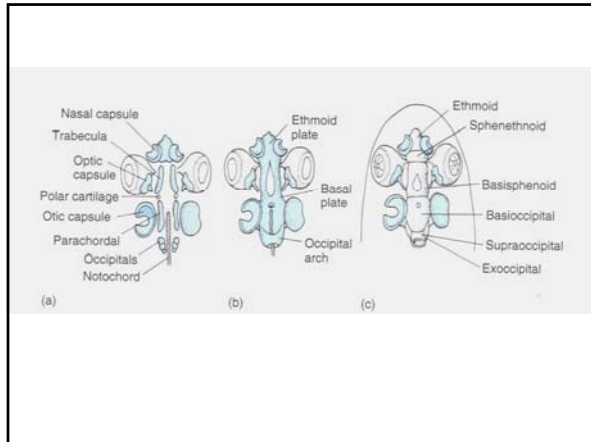


Remodeling  
Triple  
evolutionary  
sources

Chondrocranium





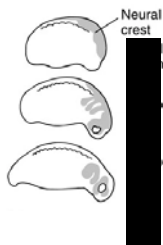
## CHONDROCRANIUM

### General Functions

- 1) Adult braincase  
(chondrichthyes)
- 2) Scaffold

## SPLANCHNOCRANIUM

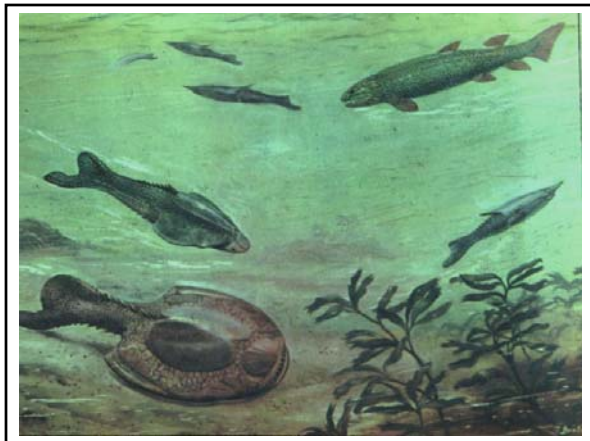
(=Visceral Skeleton)



## SPLANCHNOCRANIUM

(=Visceral Skeleton)

- 1) support respiration
- 2) support feeding apparatus
- 3) later, jaws

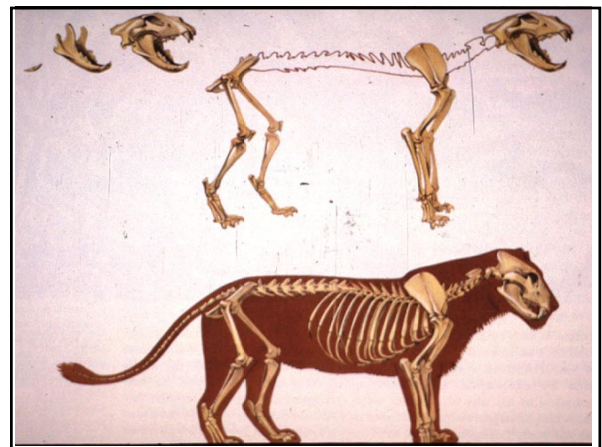
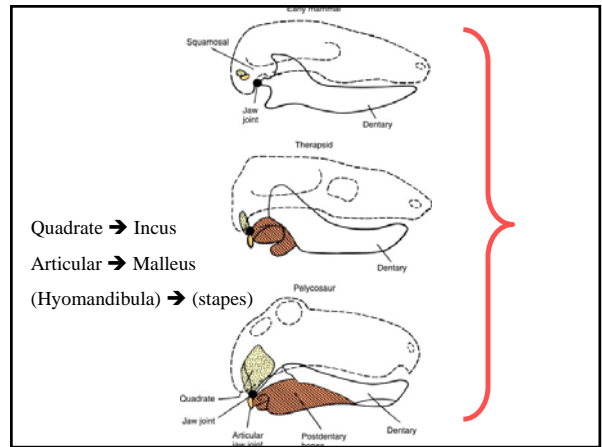
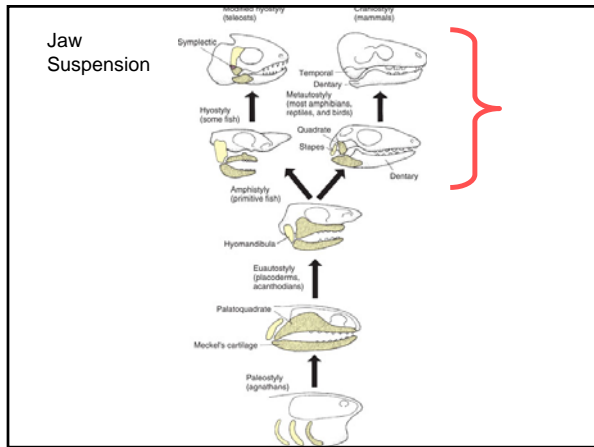
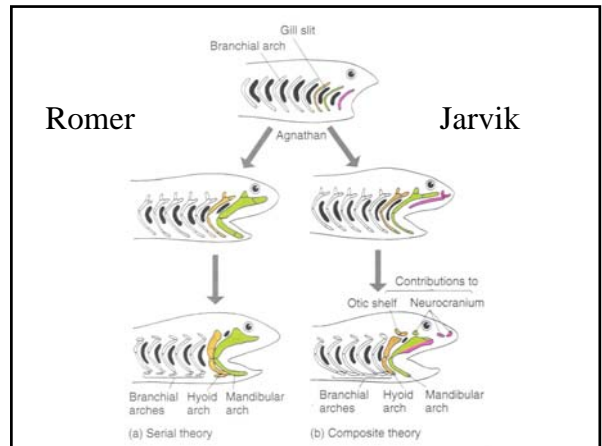
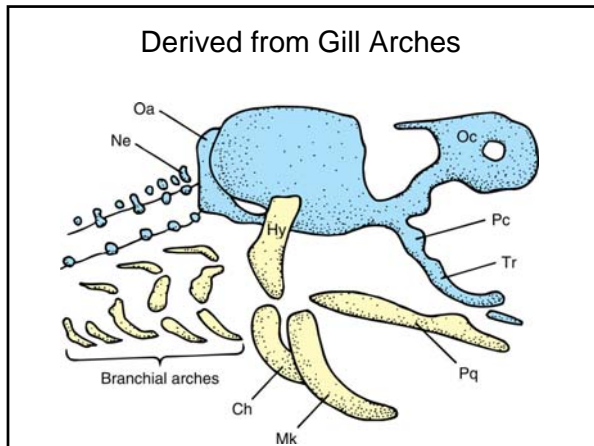


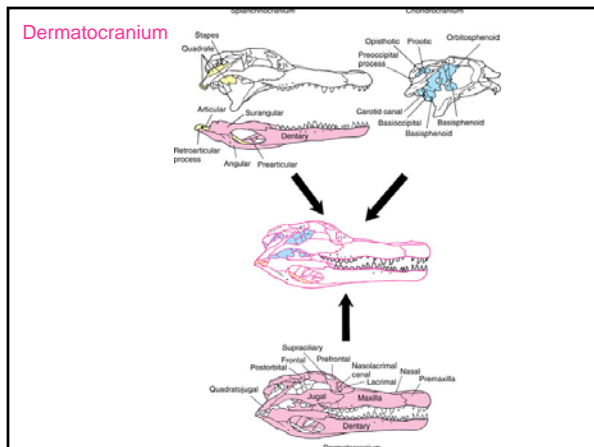
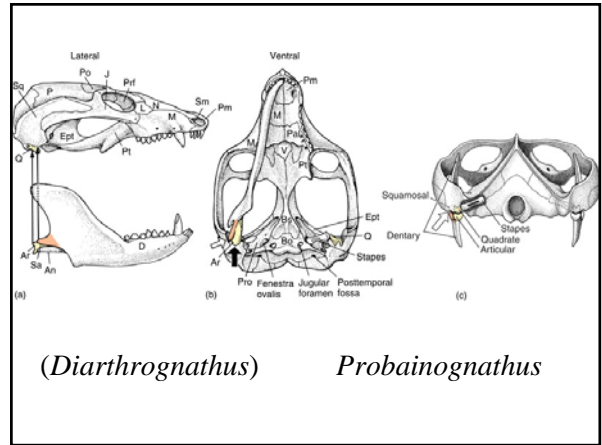
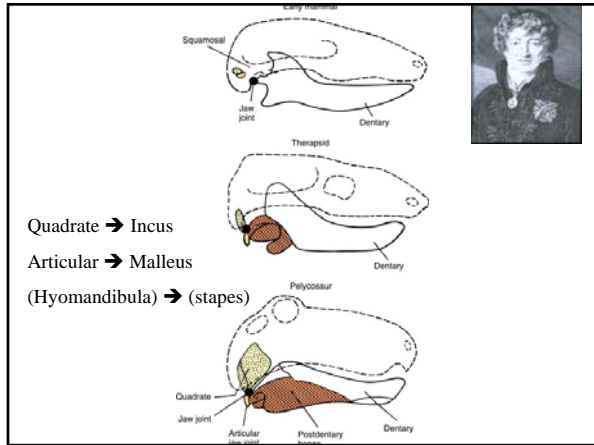
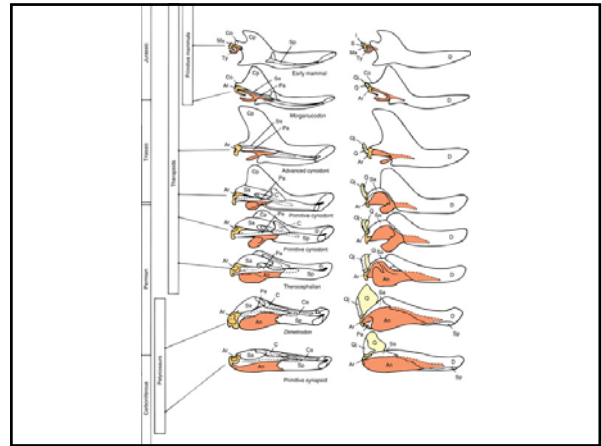
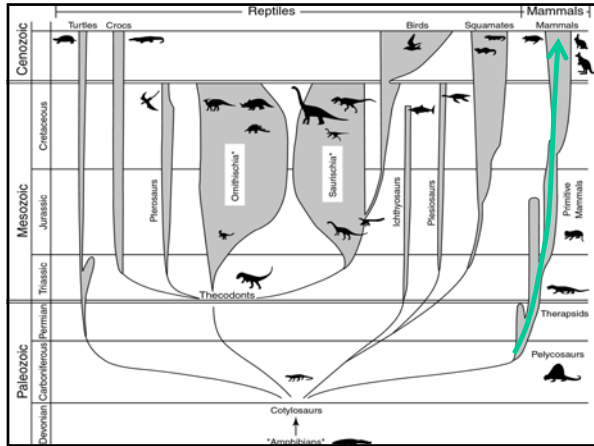
## SPLANCHNOCRANIUM

➔ JAWS

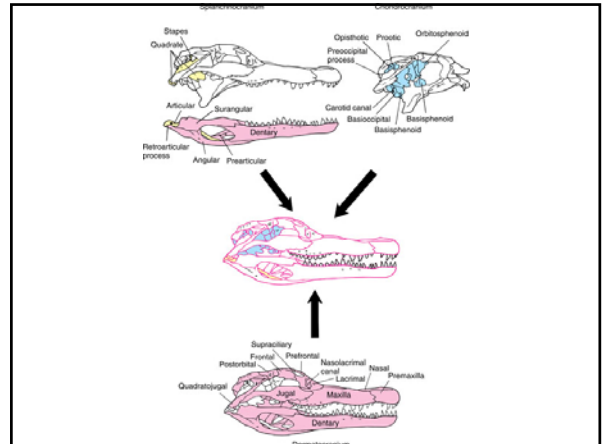
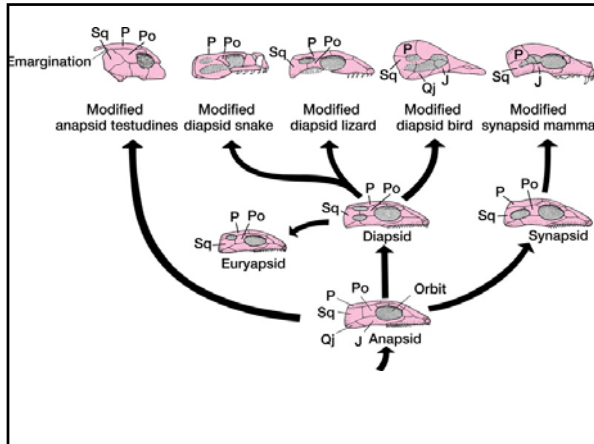
### General Functions

- 1) Prey Traps
- 2) Crushing



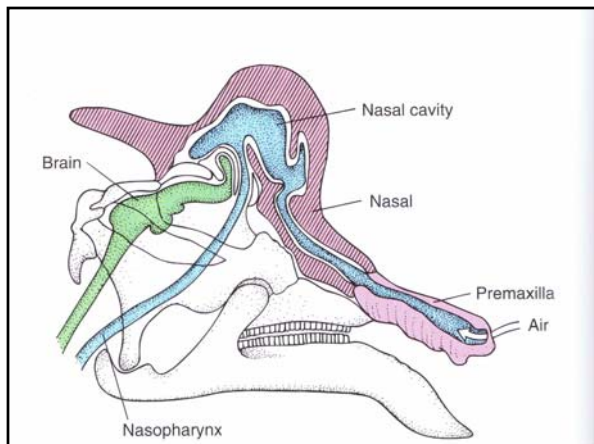


**Dermatocranium**  
 Derived from dermal Armor  
 Function  
 protect the brain



**FUNCTION**

1) Secondary



**FUNCTION**

1) Secondary

2) Primary

respiration

feeding

prey traps

swallowing

# Water vs. Land

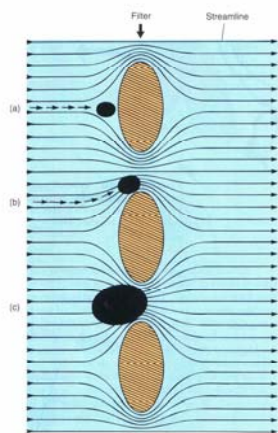
# FUNCTION

(feeding)

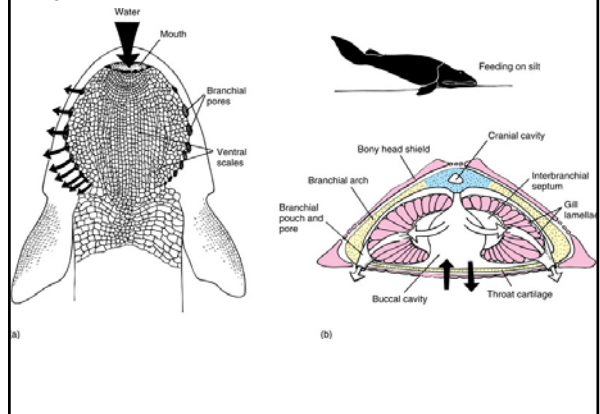
Aquatic

## Suspension Feeders

(cilia-mucus)



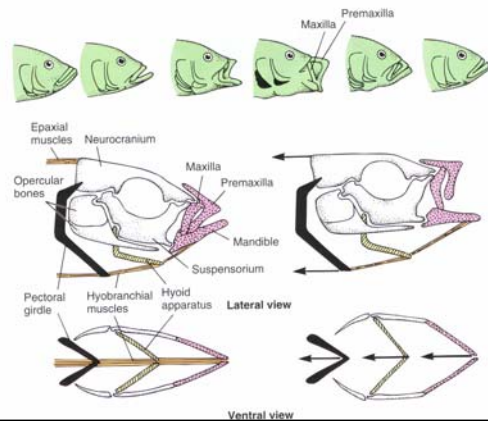
## Agnathans



## Suction Feeders

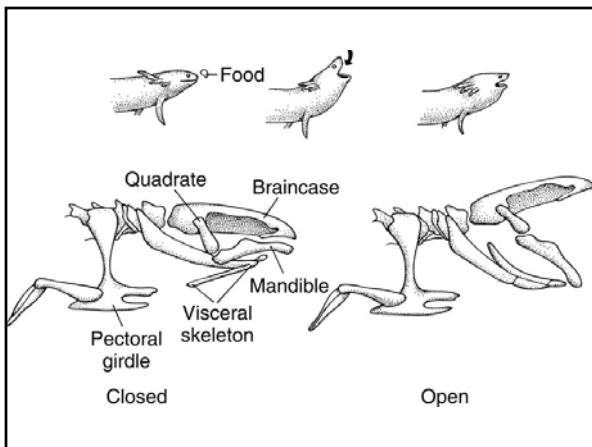
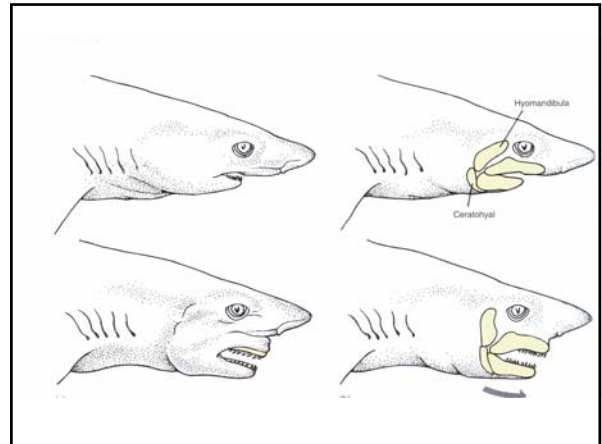
(gape 'n suck; inertial)

aquatic



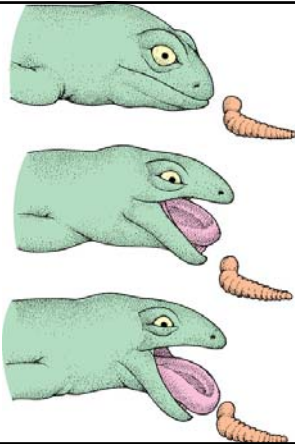
Bass

Hog sucker



**FUNCTION**  
(feeding)  
Air

Tongue



Salamander



Salamander



Salamander



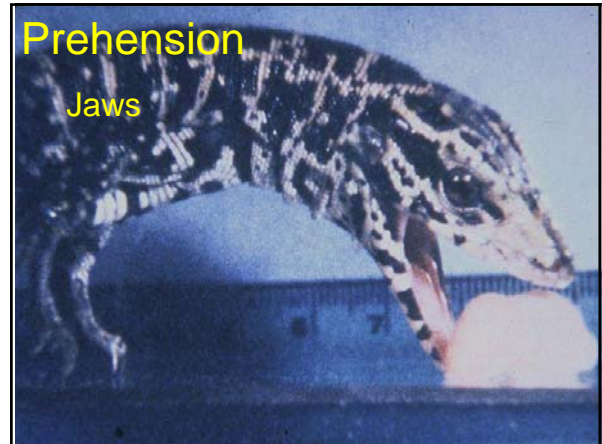
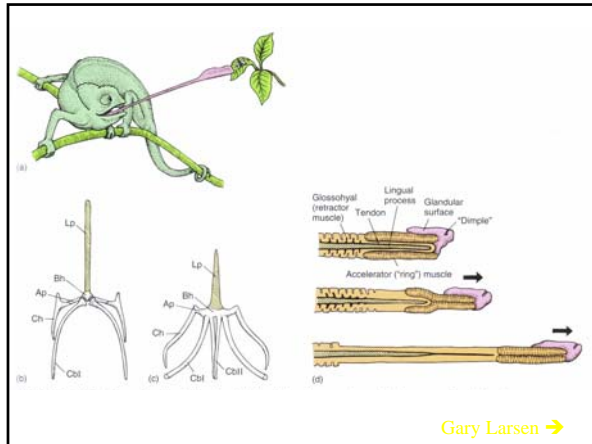
Lizard



Tongue







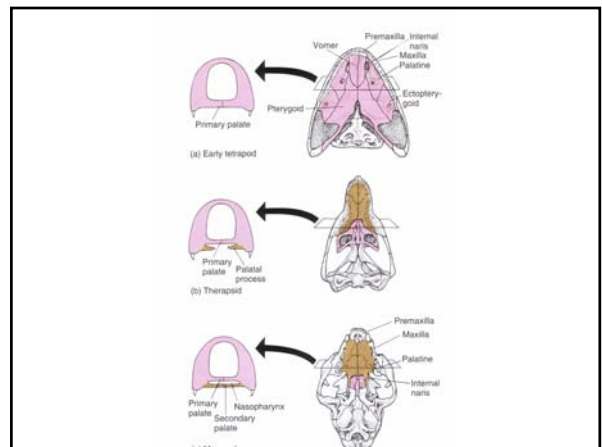
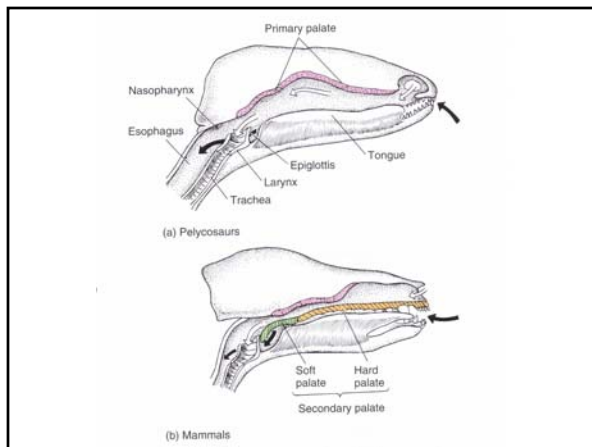
**FUNCTION**

Swallowing

- suspension
- whole (gizzard)
- mastication

Swallowing

Mastication



# Swallowing Mastication

precise occlusion  
specialized teeth  
diphyodont  
(polyphyodont)

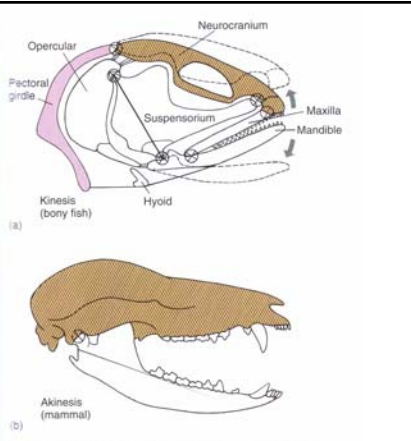
akinetic

# CRANIAL KINESIS

## Cranial kinesis

### Kinetic

### Akinetic

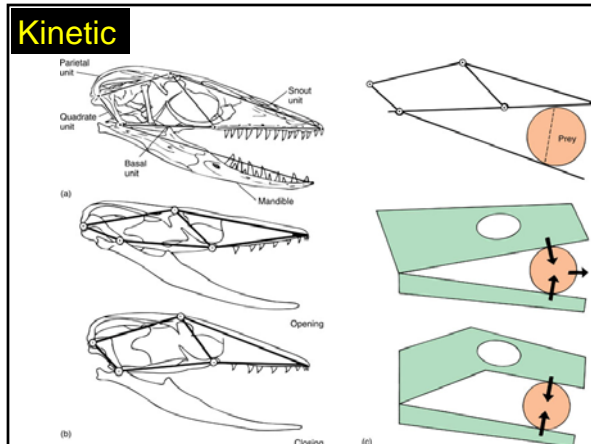


# CRANIAL KINESIS

Rapid change in size and configuration of buccal cavity.

Tooth position

## Kinetic



## Kinetic

