Digestive system functions

Food storage, reduction, absorption, elimination

Basic digestion development

- Tract from invagination of blastopore (remember gastrulation?).
- Other derivatives of endoderm: pancreas, liver, thyroid, trachea, lungs, ear canal

Feeding modes

- Ram feeding
- Suction feeding
- Chewing

Teeth

- Earliest teeth in pharynx, oral teeth evolved with jaws (Gnathostomata)
- Some have lost them (turtles, frogs, birds).
Tooth anatomy

- Bonelike dentine covered with harder enamel layer

Tooth development

- Dentine and enamel development are similar to bony scales

Tooth attachment to jaw

- Deeper vs. superficial attachments
- Attached by ligament, cement

Tooth replacement

- Polyphyodont - In most vertebrates, tooth germs are retained. Teeth develop throughout life and replace old teeth
- Most mammals are diphyodont.
Homodont teeth - vs. Heterodont teeth -

Dentine and enamel - mammals

- Relative wear

Rooted vs. rootless teeth - mammals

- Rooted - When tooth is mature, root canal closes
- Rootless - canal remains open

Mammal teeth

- Incisors, canines, premolars, molars
- Occlusion and limited replacement imp’t
Teeth quadrants

Per quadrant:
- 3 incisors – cutting, cropping
- 1 canine – piercing, killing
- 4 premolars - variable
- 3 molars

Incisors
- Front edge is enamel in rodents, teeth rootless
- Grooming comb, tusks

Canines
- Killing blow in carnivores
- Social displays, male-male combat
- Tusks

Primative placental dentary plan

Narwhal
Elephant
Premolars and molars
“Cheek teeth” - crushing, grinding, piercing
- Premolars - deciduous
- Molars - arise once

- **Bunodont** molars - crowns are rounded, covered with enamel – low-crowned (primates, pigs)

- **High-crowned teeth of herbivores** - rootless

- **Carnassials**
  - Molar or premolar – occlude to act as scissors to shear meat
Oral glands

• Found in tetrapods, except most birds.
  – Moisten tongue and bolus
  – Amylase is produced by some mammals and amphibians

Oral gland modification

• Duvernoy’s gland - venom gland
Mammal mastication

Jaw musculature

Jaw articulation and mechanics for herbivores vs. carnivores