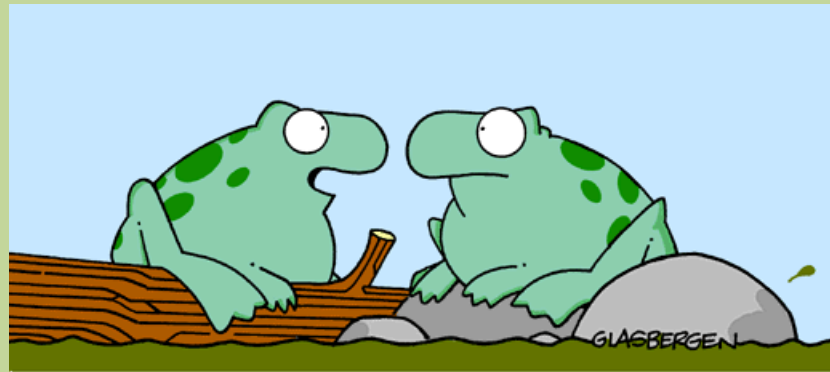


General Biology II

Lab Practical 2 Presentation



“Looks aren’t everything. It’s what’s inside you that really matters. A biology teacher told me that.”

Kingdom Animalia

Phylum Porifera



Phylum Porifera – Sponges

Poriferans Have

Asymmetry

Begin as larvae

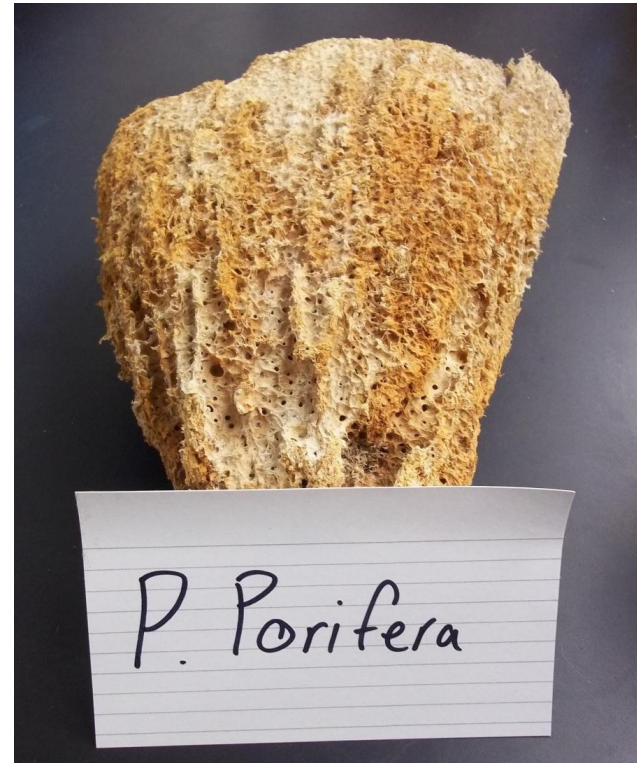
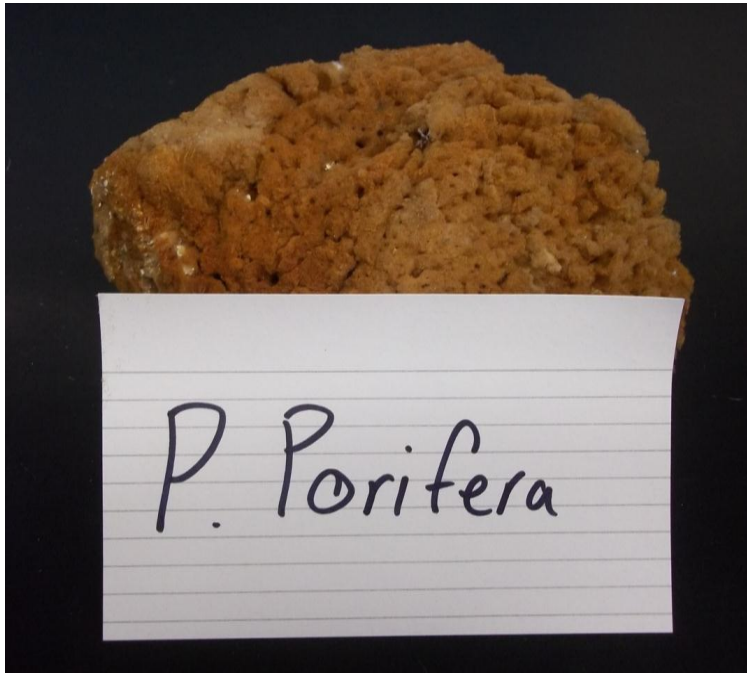
Below tissue level of organization

Collar Cells – bring in nutrients

Amoebocytes – distribute nutrients, make spicules

Spicules – calcium carbonate or silica spikes in the extracellular matrix

Phylum Porifera



Phylum Porifera

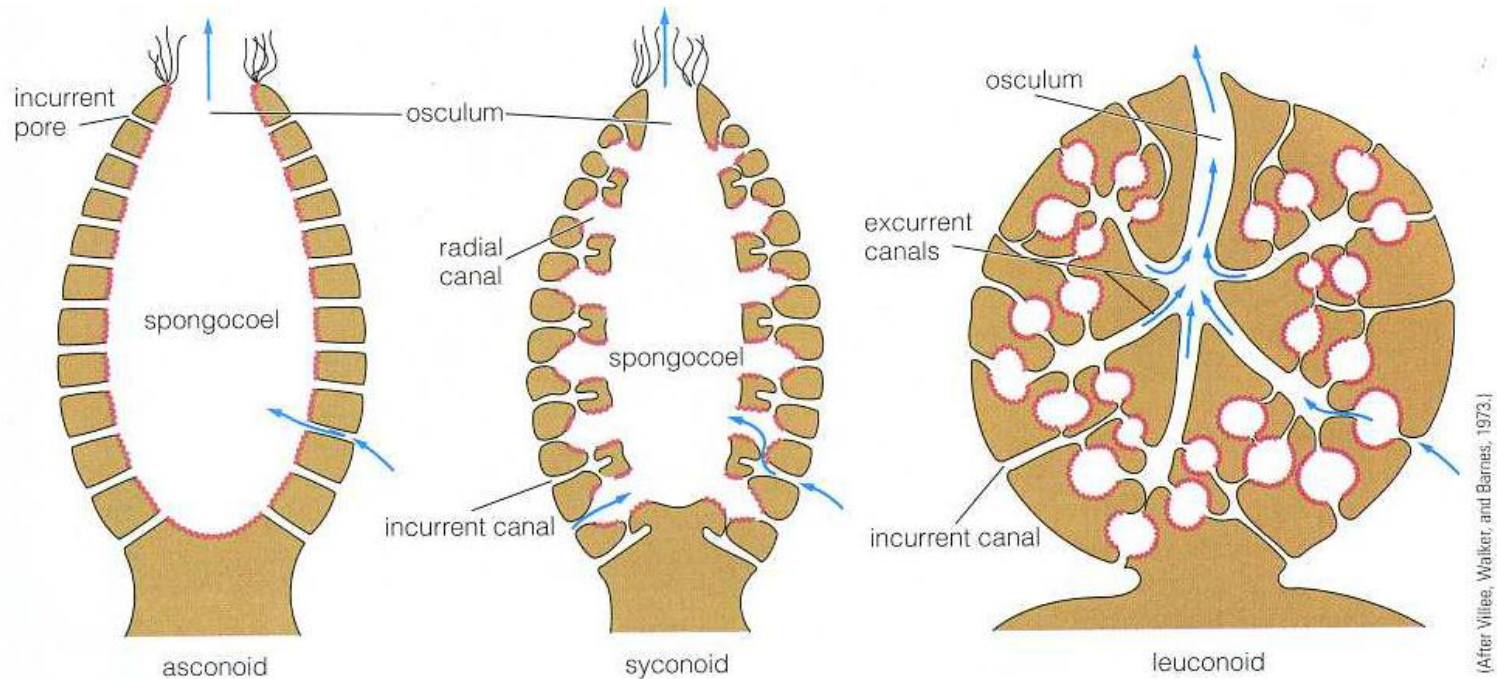
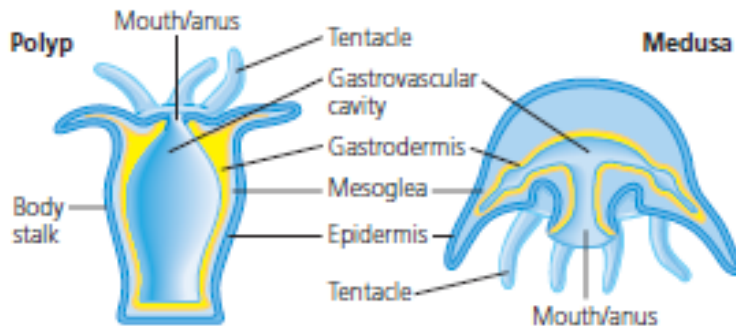


Figure 26-4 Three body plans of sponges. The blue arrows indicate the direction of water flow. Pink areas are lined by collar cells.

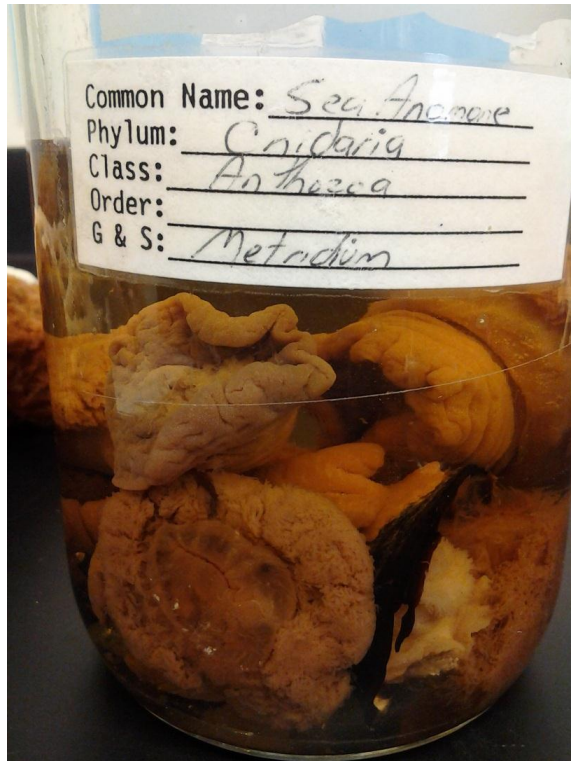
Phylum Cnidaria



▲ **Figure 33.5 Polyp and medusa forms of cnidarians.** The body wall of a cnidarian has two layers of cells: an outer layer of epidermis (darker blue; derived from ectoderm) and an inner layer of gastrodermis (yellow; derived from endoderm). Digestion begins in the gastrovascular cavity and is completed inside food vacuoles in the gastrodermal cells. Flagella on the gastrodermal cells keep the contents of the gastrovascular cavity agitated and help distribute nutrients. Sandwiched between the epidermis and gastrodermis is a gelatinous layer, the mesoglea.

Cnidarians have
Radial Symmetry
Begin as Polyps, Adults are medusa
Some have only a polyp or a medusa stage
Ectoderm and Endoderm tissue
Mesoglea
Incomplete Digestive System
No coelom
Cnidocytes – stinging cells

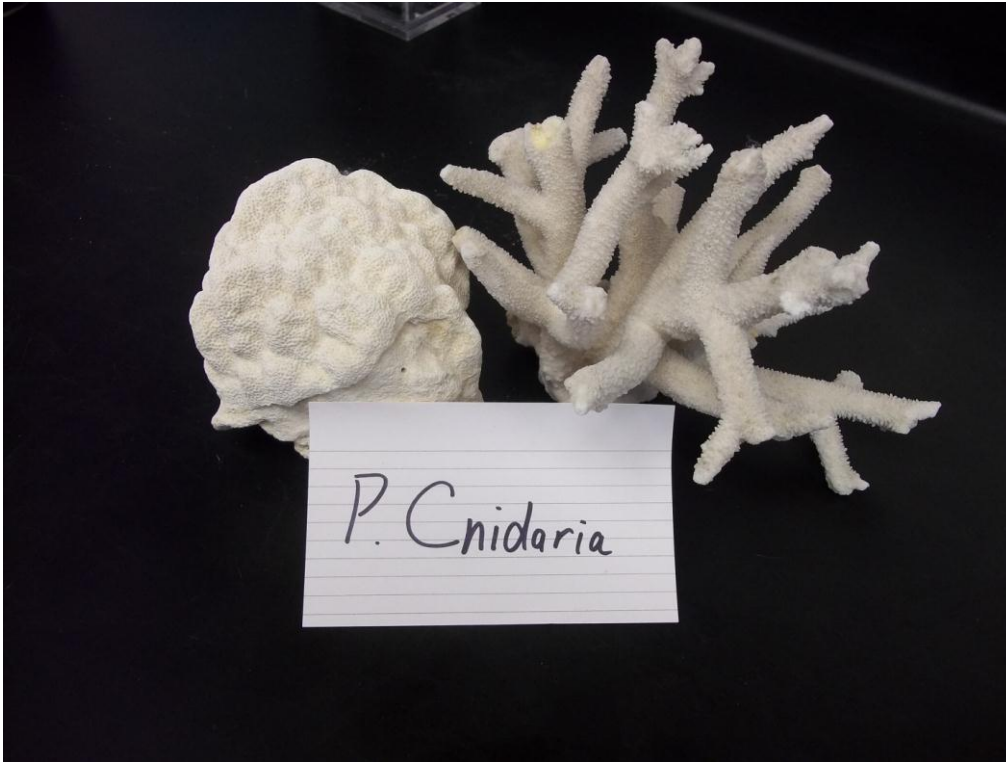
Phylum Cnidaria



Sea Anemone – Class Anthozoa

Anthozoans only have a polyp stage

Phylum Cnidaria



Class Anthozoa

- Corals are in the phylum Cnidaria, class Anthozoa

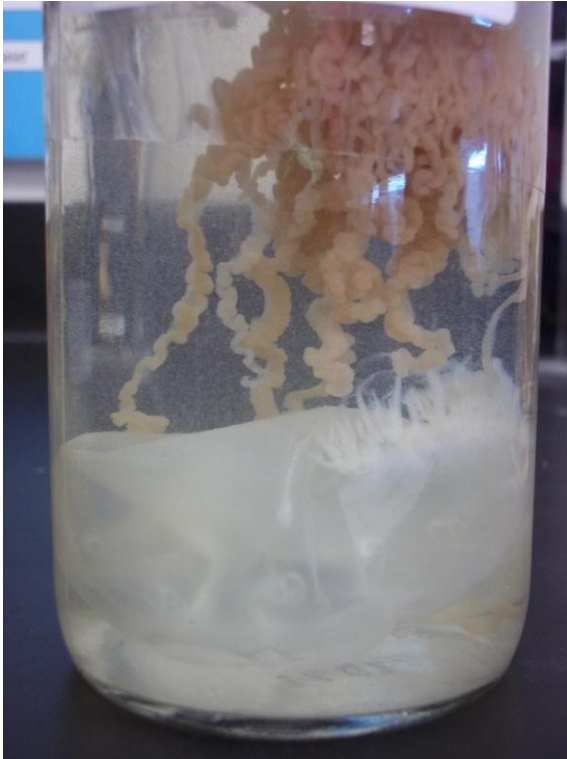
Phylum Cnidaria



Hydrocoral – Class Hydrozoa

Hydrozoans have both a polyp and a medusa stage, and live as colonial polyps.

Phylum Cnidaria



Man of War – Class Hydrozoa

The man of war jellyfish is an example of the medusa stage of cnidarians

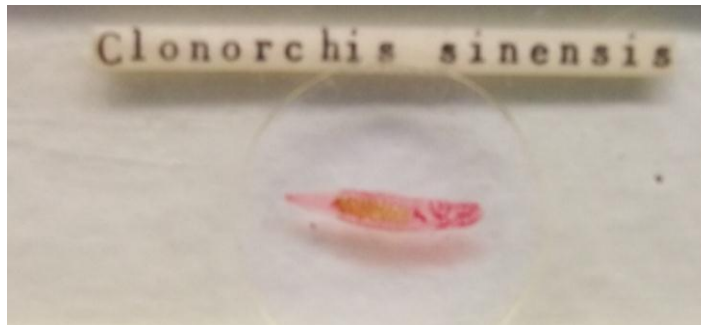
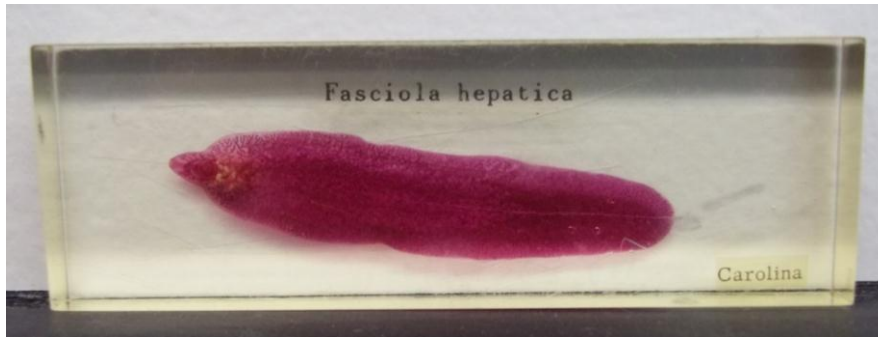
Phylum Cnidaria



Cassiopeia – Class Scyphozoa

Scyphozoans have only a medusa stage or a very reduced polyp stage.

Phylum Platyhelminthes



Phylum Platyhelminthes

consists of flatworms,
tapeworms and flukes

They have

Bilateral Symmetry

Eye Spots with ganglia and

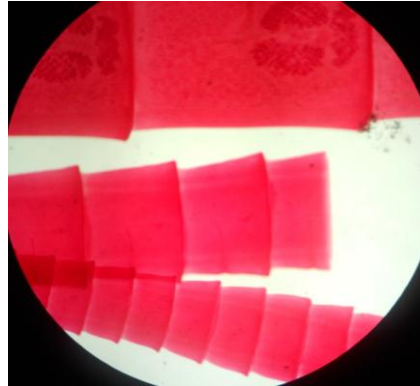
two ventral nerve cords

Incomplete digestive system

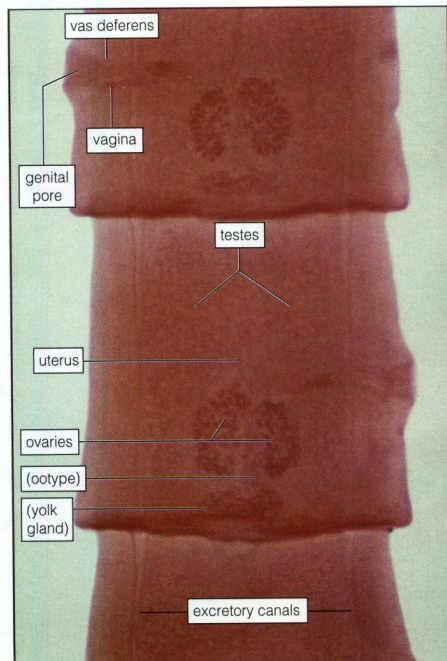
No segments

No coelom

Phylum Platyhelminthes



Tapeworms



a

Figure 27-9 Tapeworm mature proglottids (*Taenia pisiformis*).

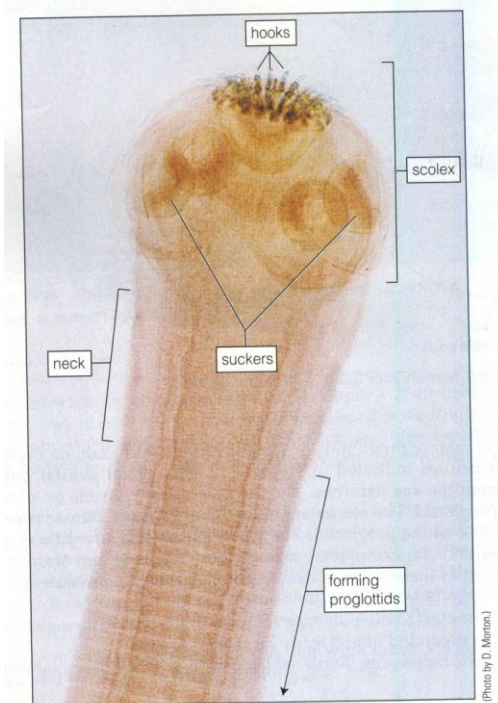
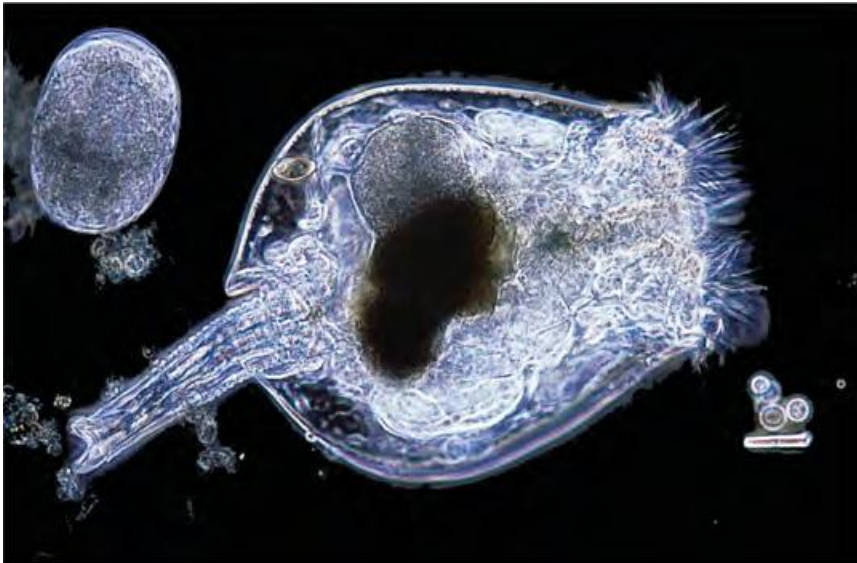


Figure 27-8 Tapeworm scolex (*Taenia pisiformis*), w.m. (40 \times).

Phylum Rotifera



Phylum Rotifera consists of microscopic organisms with some complex organ systems, despite their tiny size

Rotifers have

Bilateral Symmetry

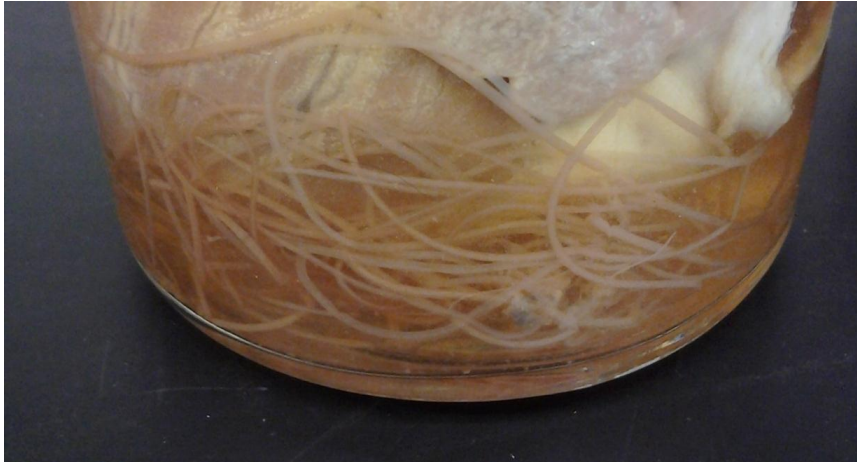
Complete Digestive System

Distinctive crown of cilia that draws water into the mouth

Pseudocoelom

Ability to undergo parthenogenesis

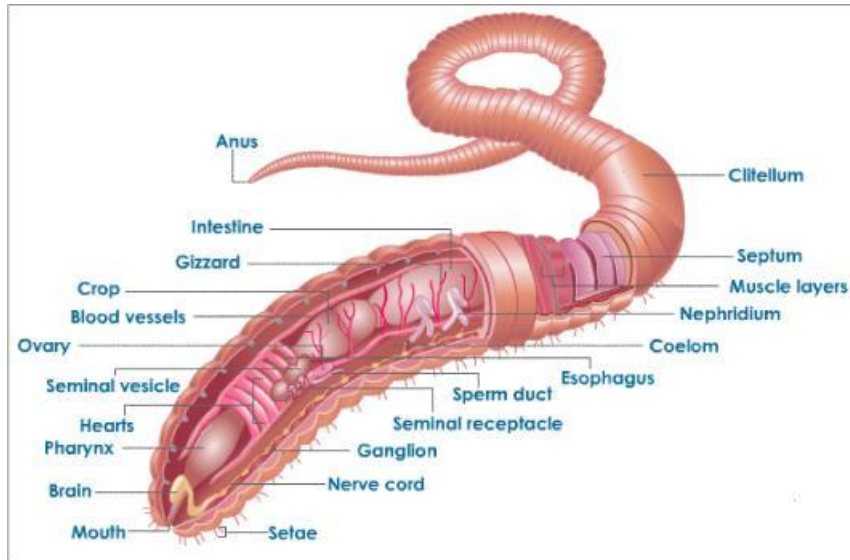
Phylum Nematoda



Phylum Nematoda –
Roundworms

Nematodes Have
Non-segmented body
Cuticle covering (form of
exoskeleton)
First complete “tube within
a tube” body scheme
Pseudocoelomates
Lateral Nerve Cords

Phylum Annelida



Phylum Annelida – Segmented worms – Earthworms, Leeches

Annelids Have

Segmented body

Complete Digestive tract

True coelom

Closed circulatory system

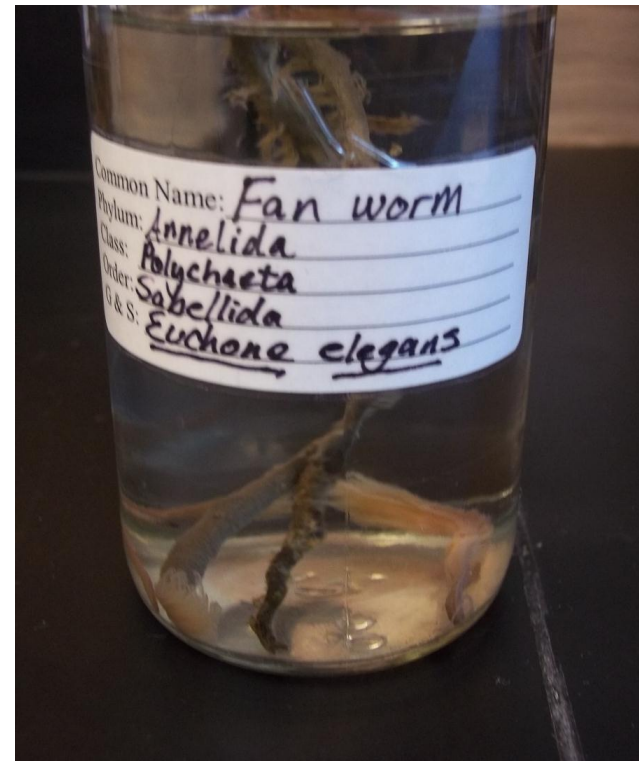
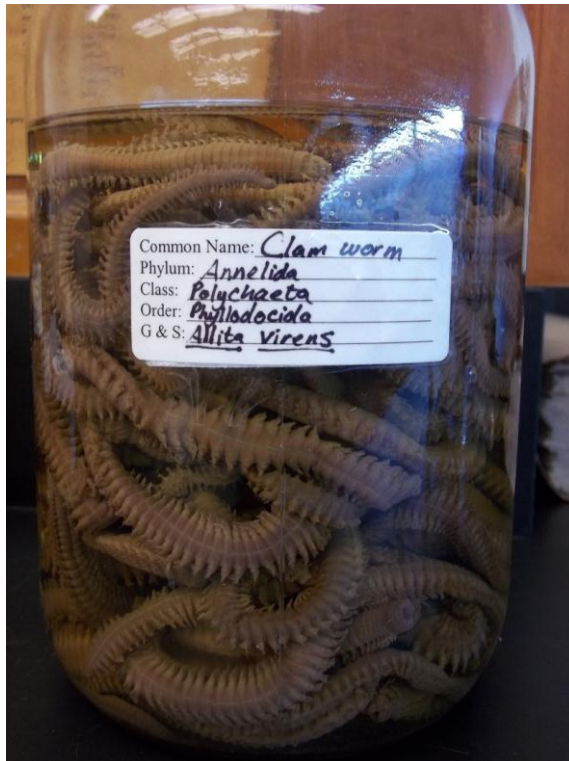
Gas Exchange through skin (earthworms)

Gills (marine worms)

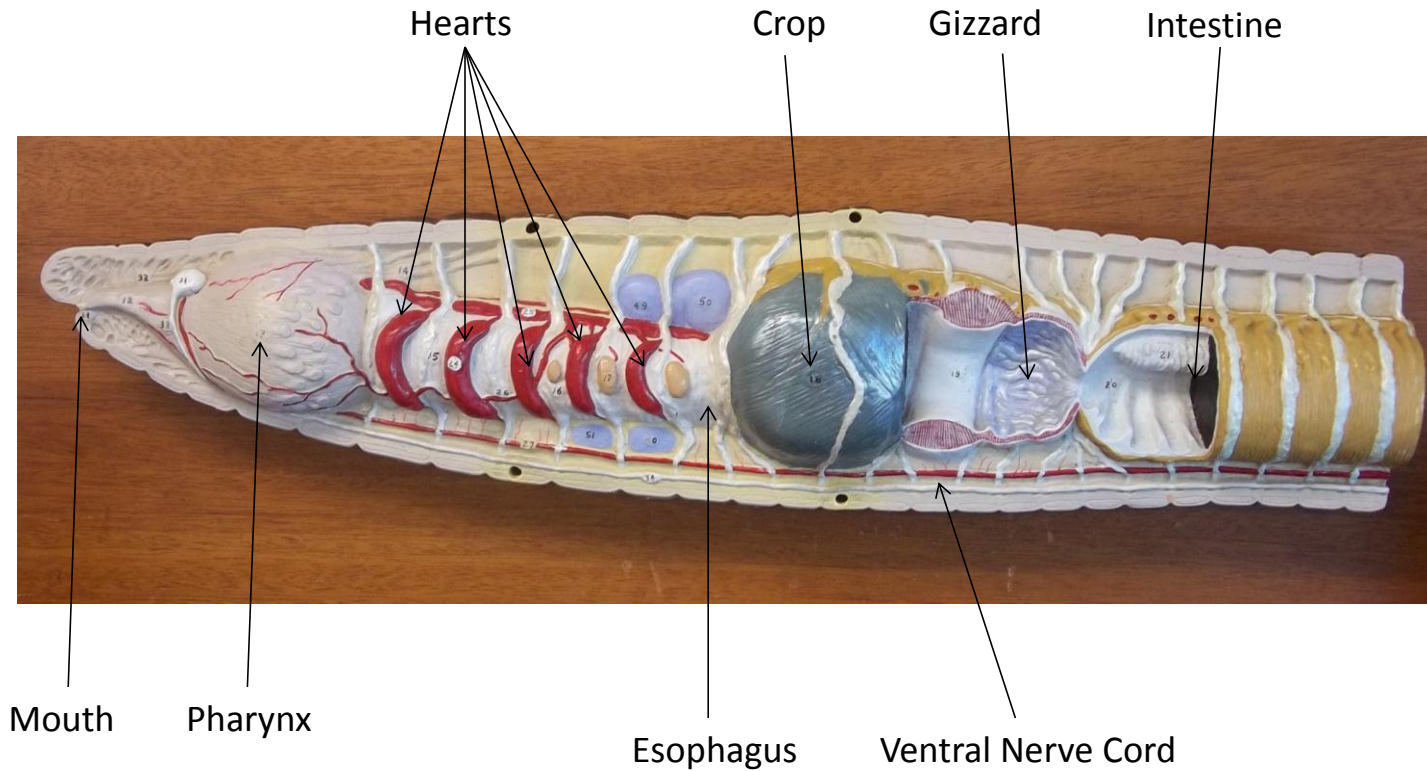
Pair of metanephridia in each segment

Both male and female reproductive organs

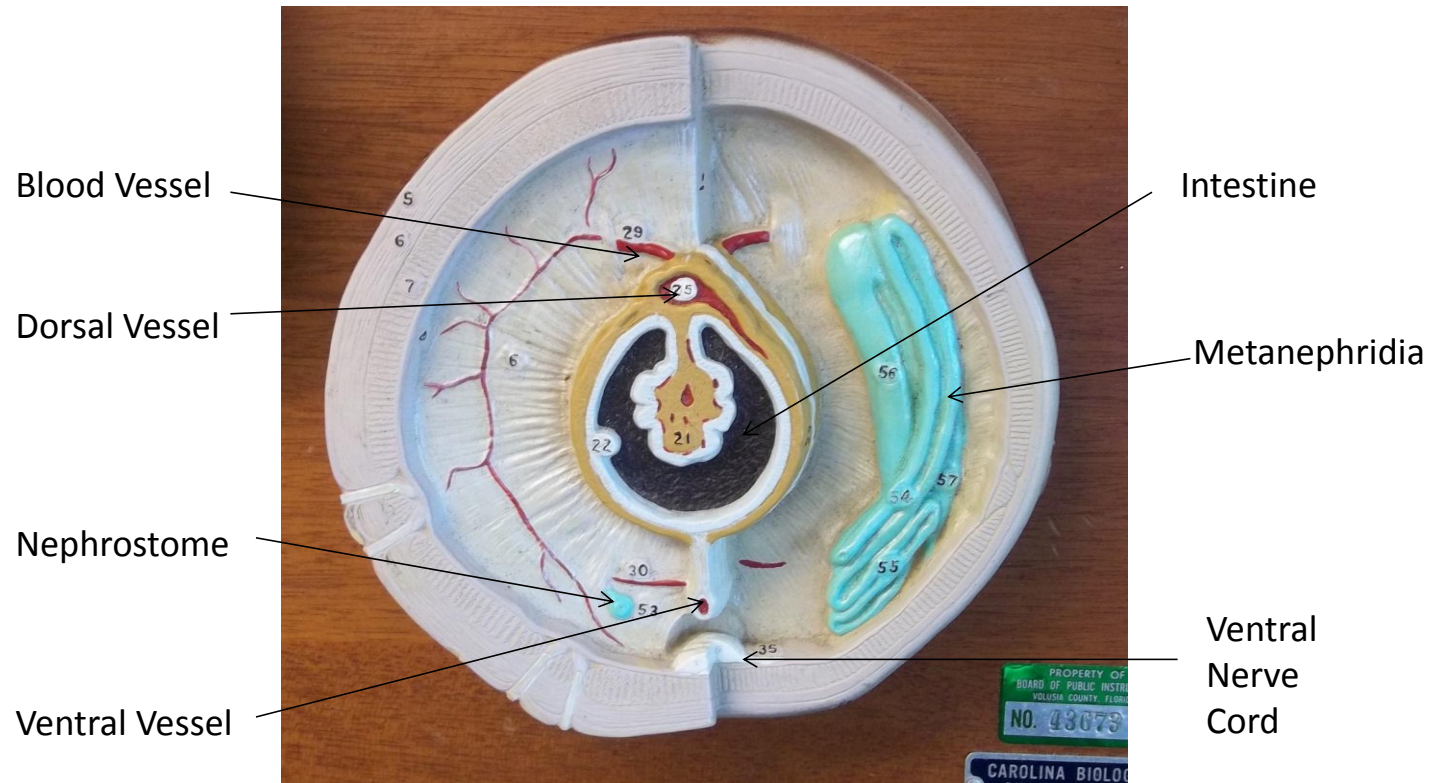
Phylum Annelida



Phylum Annelida - Model



Phylum Annelida - Model



Phylum Annelida - Model



How many “hearts” does
an earthworm have?

5 PAIRS

Mouth

Aortic Arches

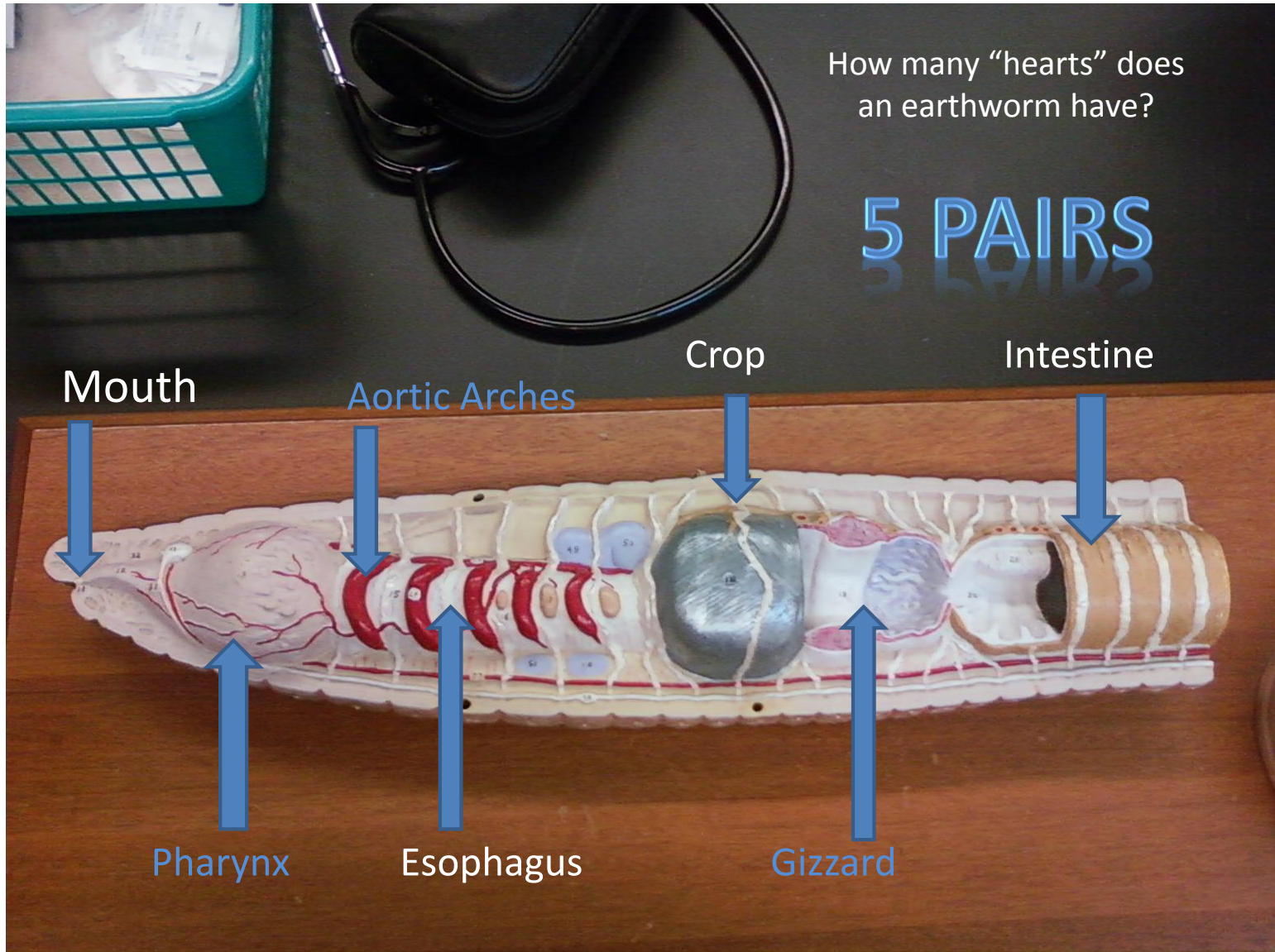
Crop

Intestine

Pharynx

Esophagus

Gizzard



Phylum Mollusca



Phylum Mollusca

includes animals like
clams, octopi, snails, and
mussels

Molluscs Have

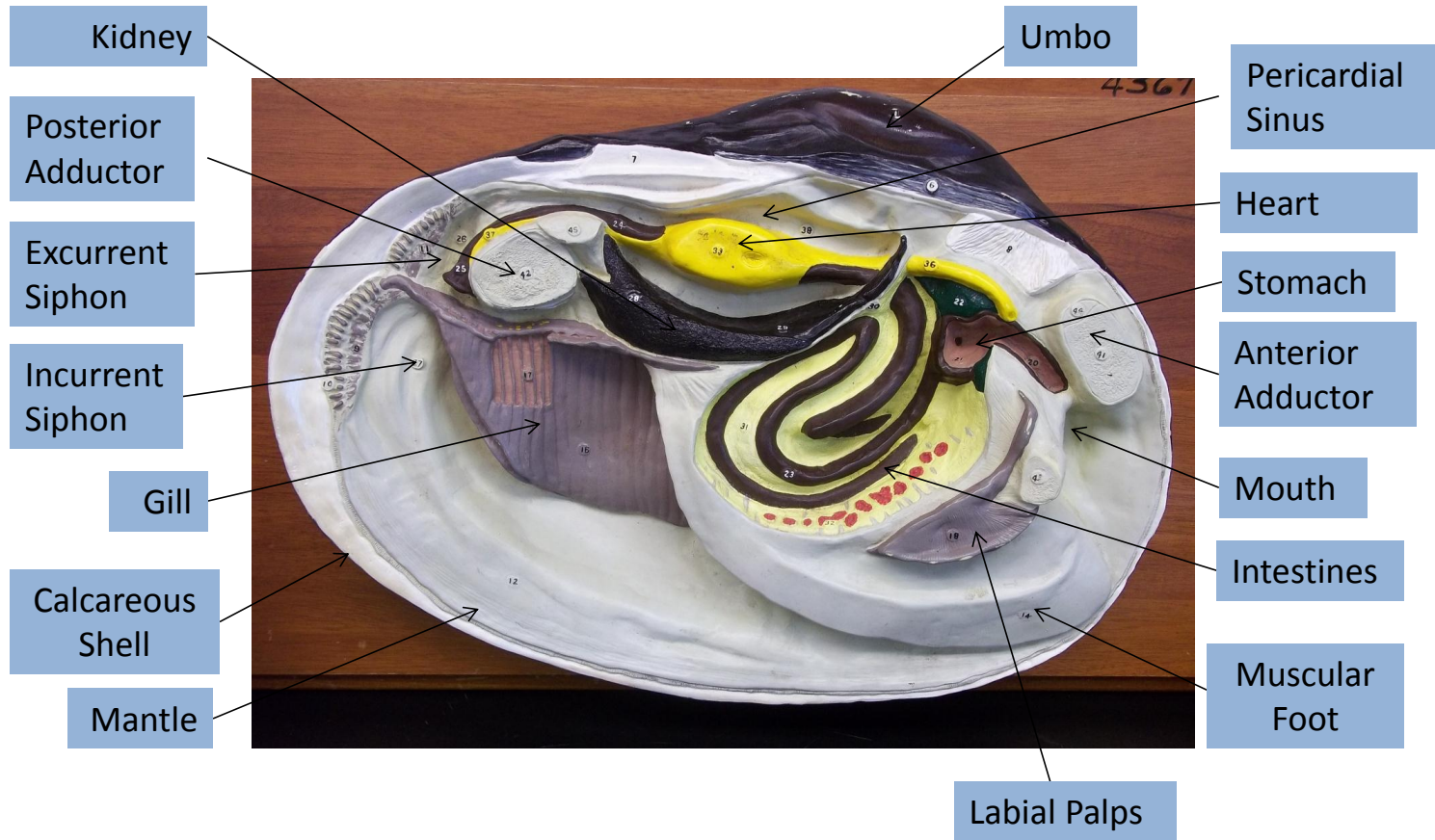
Bilateral Symmetry
Complete digestive
system

True Coelom

Most have open, but
some have closed
circulatory systems
(squid/octopi)

Calcereous Shells
secreted by mantle
Muscular foot
Visceral Mass

Phylum Mollusca – Class Bivalvia



Phylum Mollusca



Class Bivalvia – Clams, Oysters, etc

Bivalves Have

Calcareous Shells secreted by the mantle, covers visceral mass

Muscular foot for movement

Complete digestive system

Open circulatory system

Phylum Mollusca



Class Gastropoda – Snails, Slugs

Gastropods Have

Single spiraled shell, or no shell in slugs

Complete Digestive System

Undergo torsion in embryonic development

Distinct head with eyes

Have Radula

Have gills

Phylum Mollusca



Class Cephalopodia – Squids, Octopi, Chambered Nautiluses

Cephalopods Have
Closed Circulatory System
Well Developed Brains
Internalized or nonexistent shell (nautiluses are the only cephalopods with a shell)

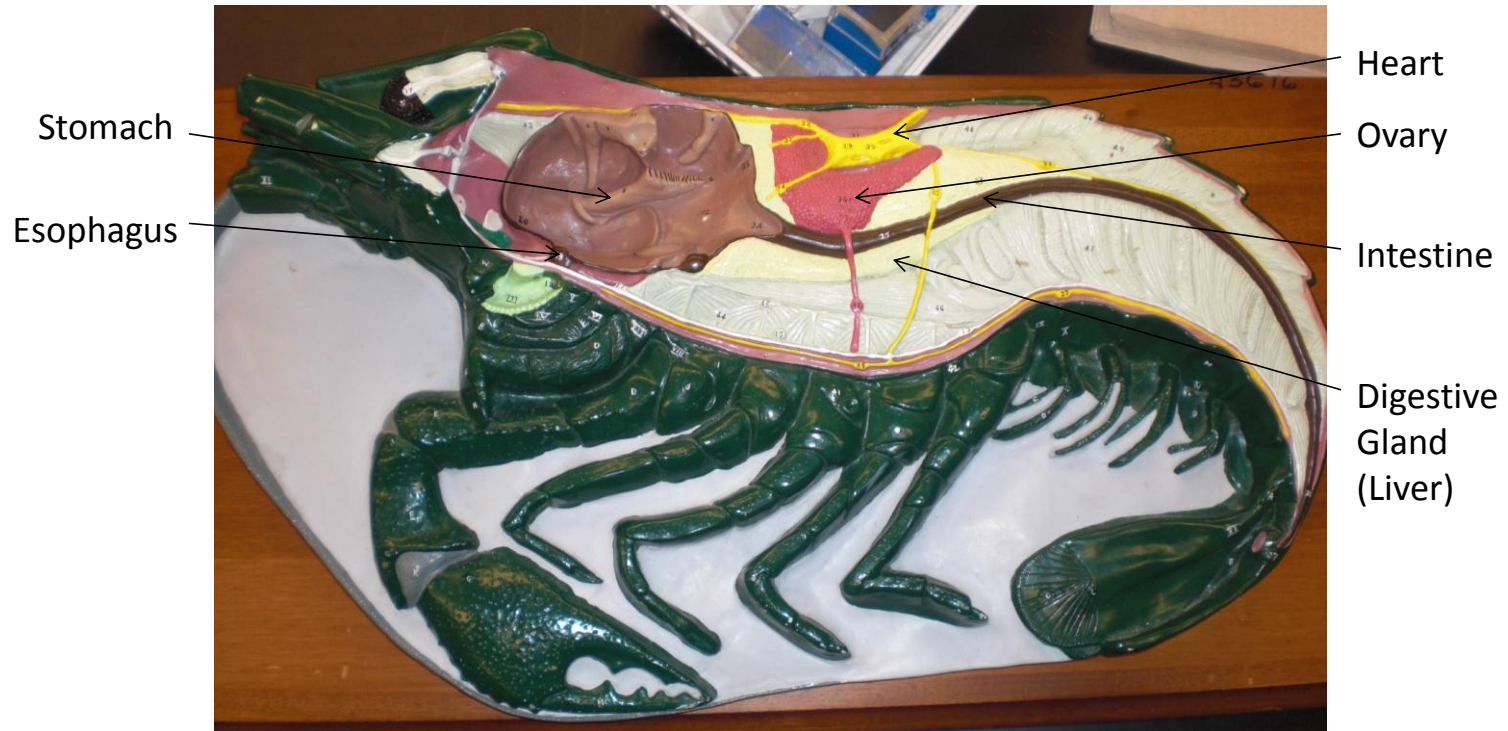
Phylum Arthropoda



Phylum Arthropoda –
Insects, Arachnids, and
Crustaceans

Arthropods have
Exoskeleton made of chitin
Open circulatory system
Bilateral Symmetry
Complete Digestive Tract
Ventral nerve cords
Segmented Bodies
Jointed legs

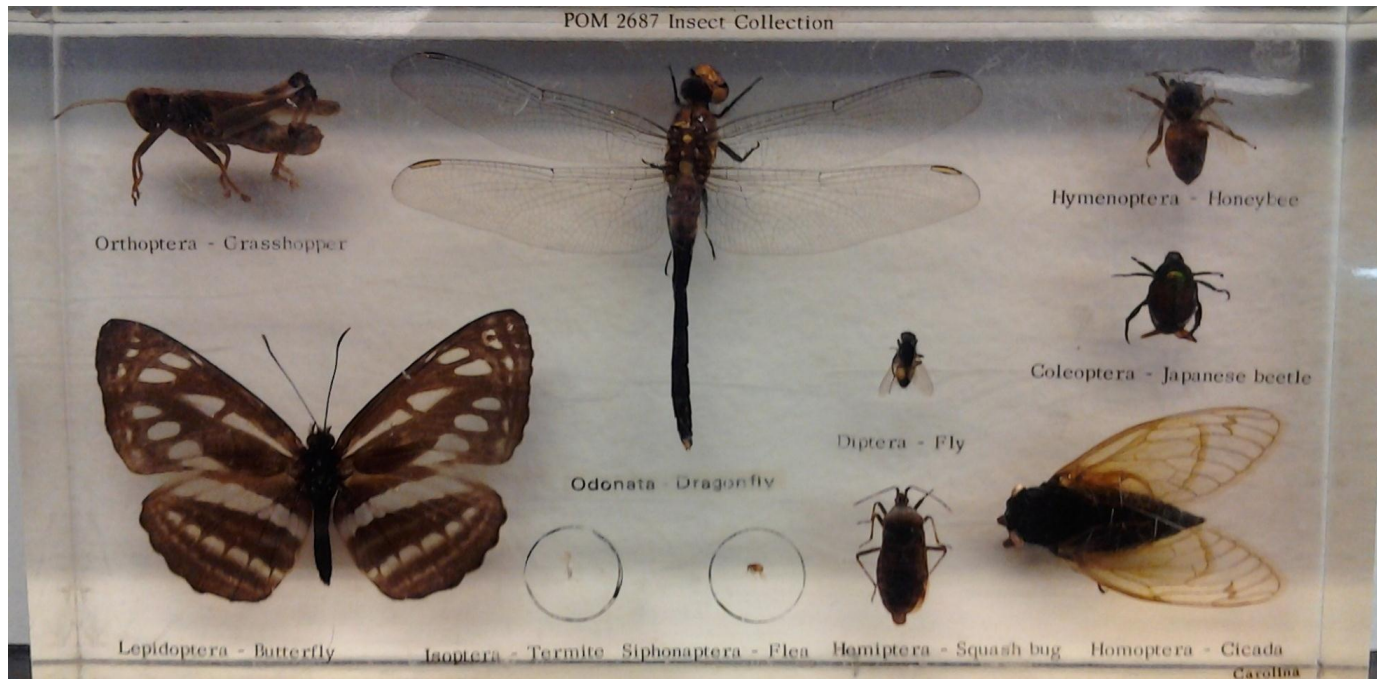
Phylum Arthropoda



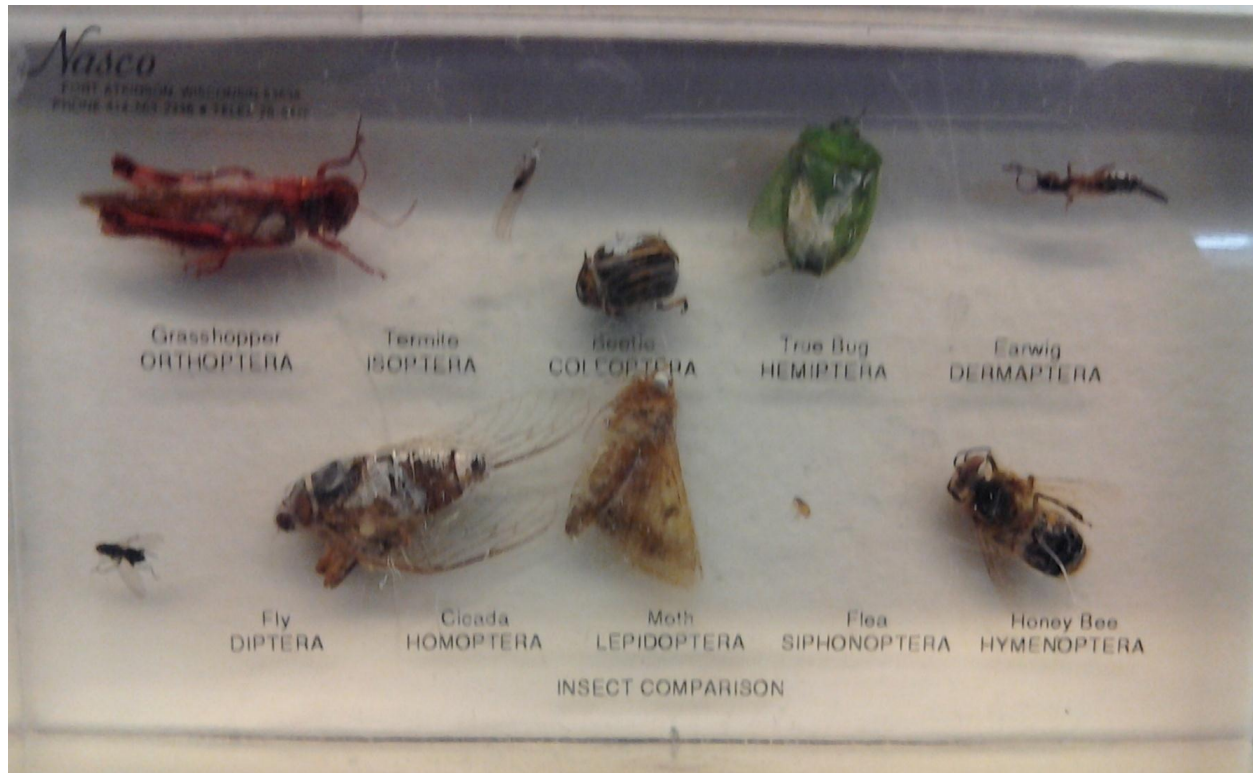
Phylum Arthropoda



Phylum Arthropoda



Phylum Arthropoda



Phylum Arthropoda



Phylum Echinodermata



Phylum Echinodermata – Sea stars, sea urchins, sea cucumbers

Echinoderms Have

Bilateral symmetry as larvae, radial symmetry as adults

Endoskeleton of calcium carbonate

Closed circulatory system

Water vascular system

Tube feet

Madreporite (entry/exit to water vascular system)

Phylum Echinodermata



Phylum Echinodermata



Phylum Chordata



Phylum Chordata – All chordates, including tunicates, lancelets, hagfish, lamprey, sharks, fish, amphibians, reptiles, and mammals

Everything after this slide is in Phylum Chordata

All Chordates Have

Bilateral symmetry

Closed circulatory system

Complete digestive tract

True Coelom

A hollow dorsal nerve cord

A notochord

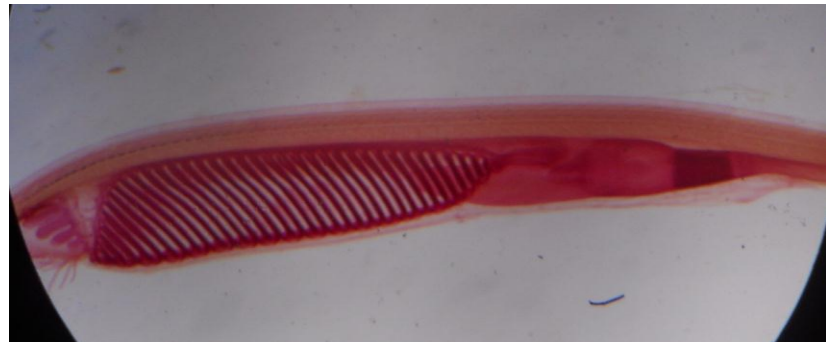
Pharyngeal gill slits

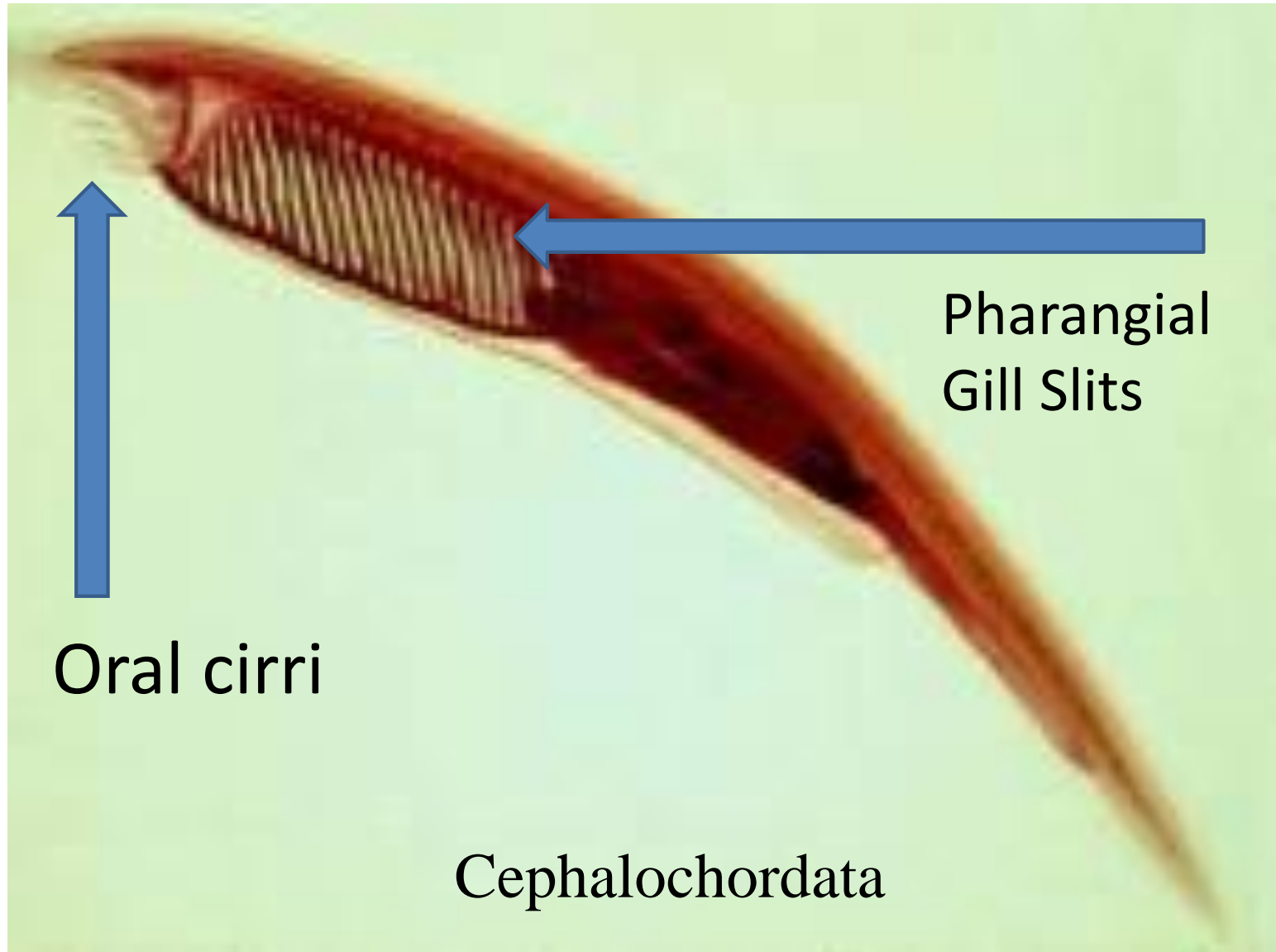
Post anal tail

Sub-Phylum Cephalochordata



Sub-phylum Cephalochordata – Lancelets
First Chordates





Sub-Phylum Urochordata



Sub-Phylum Urochordata – Sea Squirt Tunicates

Lose post-anal tail and notochord in adulthood



Sub-Phylum Vertebrata

- Myxini (Craniate not Vertebrate)
- Petromyzontida
- Chondrichthyes
- Osteichthyes
 - Actinopterygii
 - Actinista
 - Dipnoi
- Amphibia
- Reptilia
 - Aves
- Mammalia
- All VERTEBRATES have a backbone, in addition to all the characteristics of chordates.

Class Myxini



Class Myxini – Hagfish

Hagfish have

Cephalization, but no backbone

Are not true vertebrates

Craniates

Class Petromyzontida



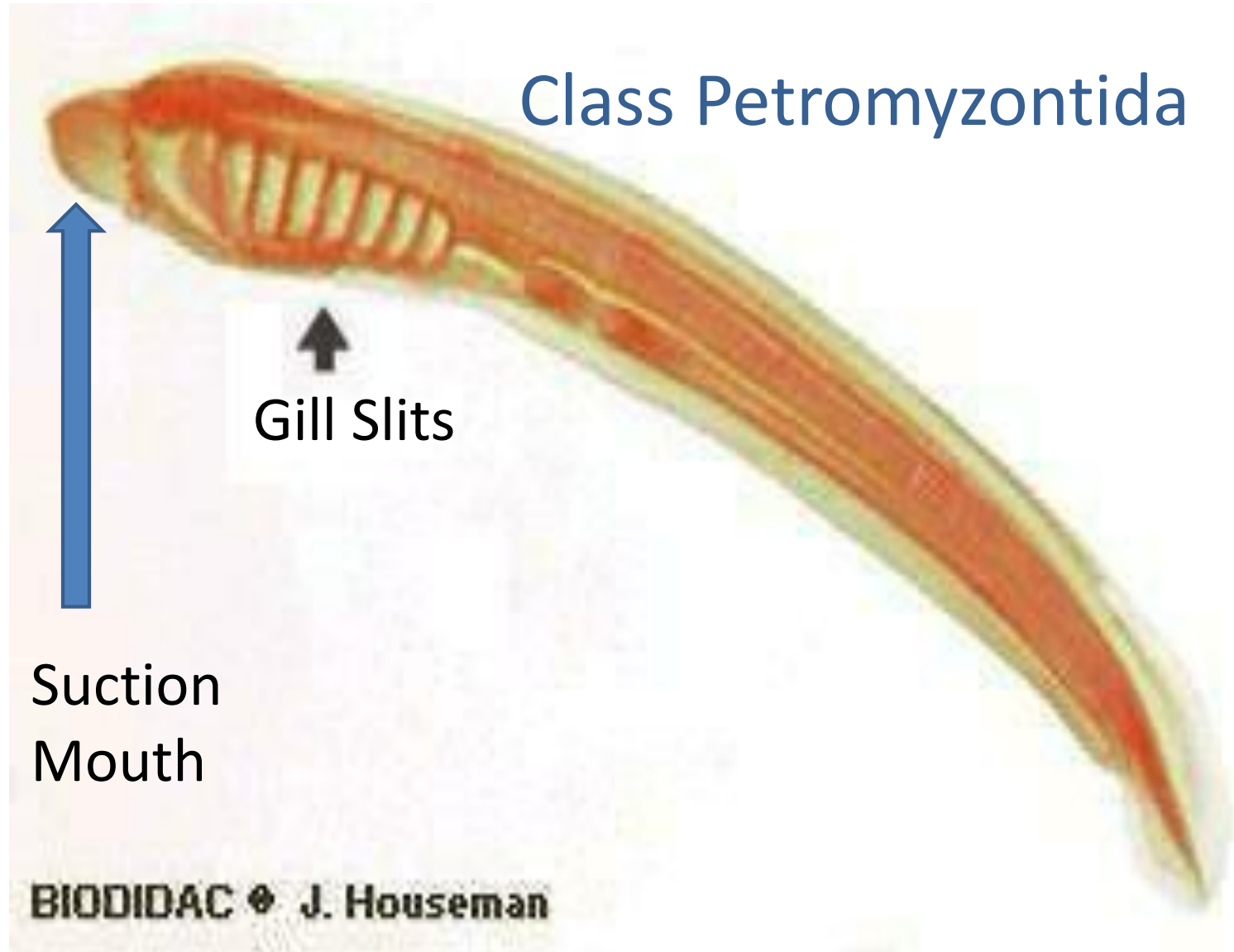
Class Petromyzontida – Lampreys

Lampreys Have
Teeth

True Backbone, no jaw



Class Petromyzontida



Class Chondrichthyes



Class Chondrichthyes – Sharks, skates and rays

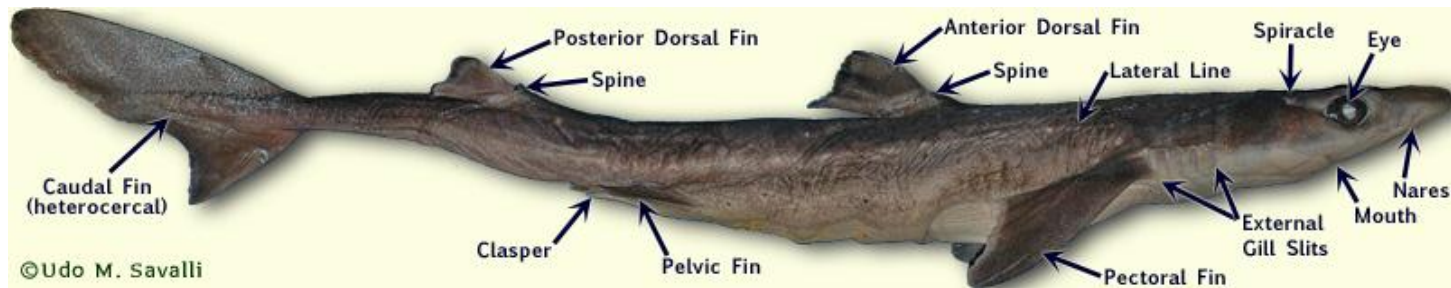
Chondrichthyans Have

Living Skeleton made entirely of cartilage

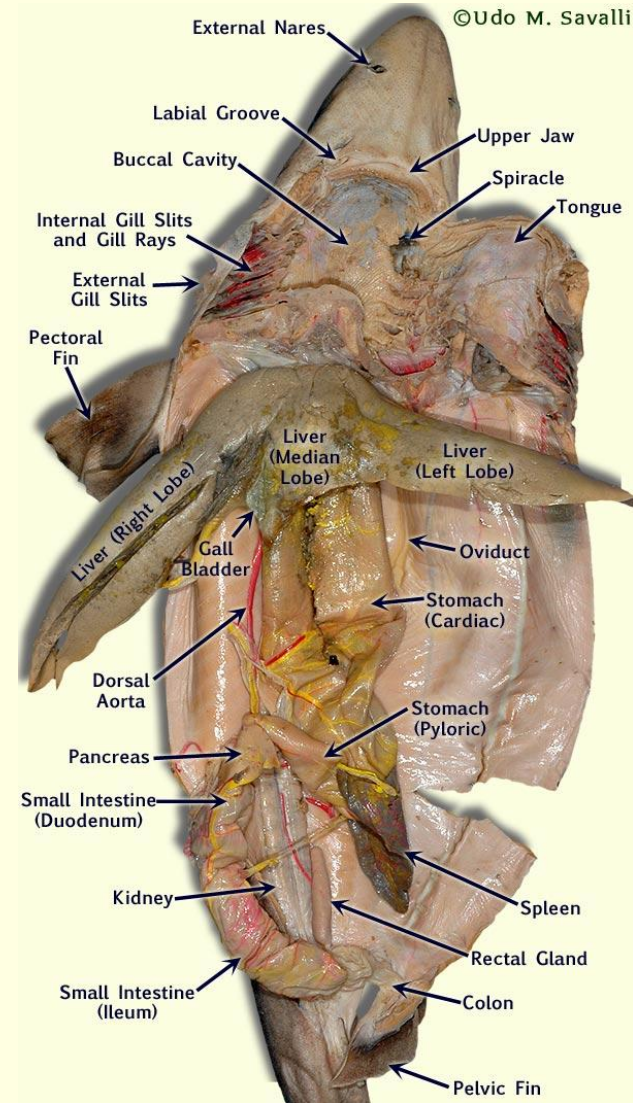
Ancient chondrichthyans had
bone skeletons

Fins for swimming

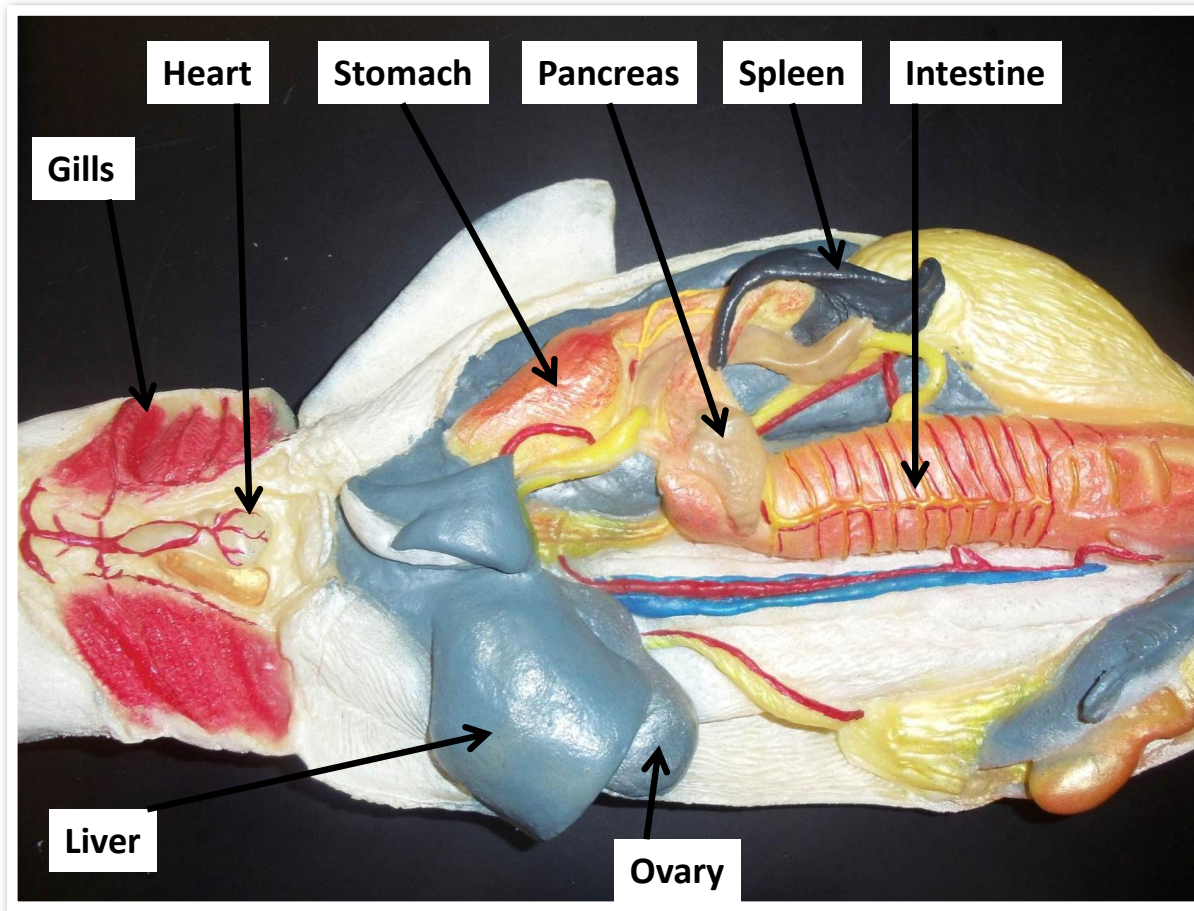
Spiny Dogfish Shark



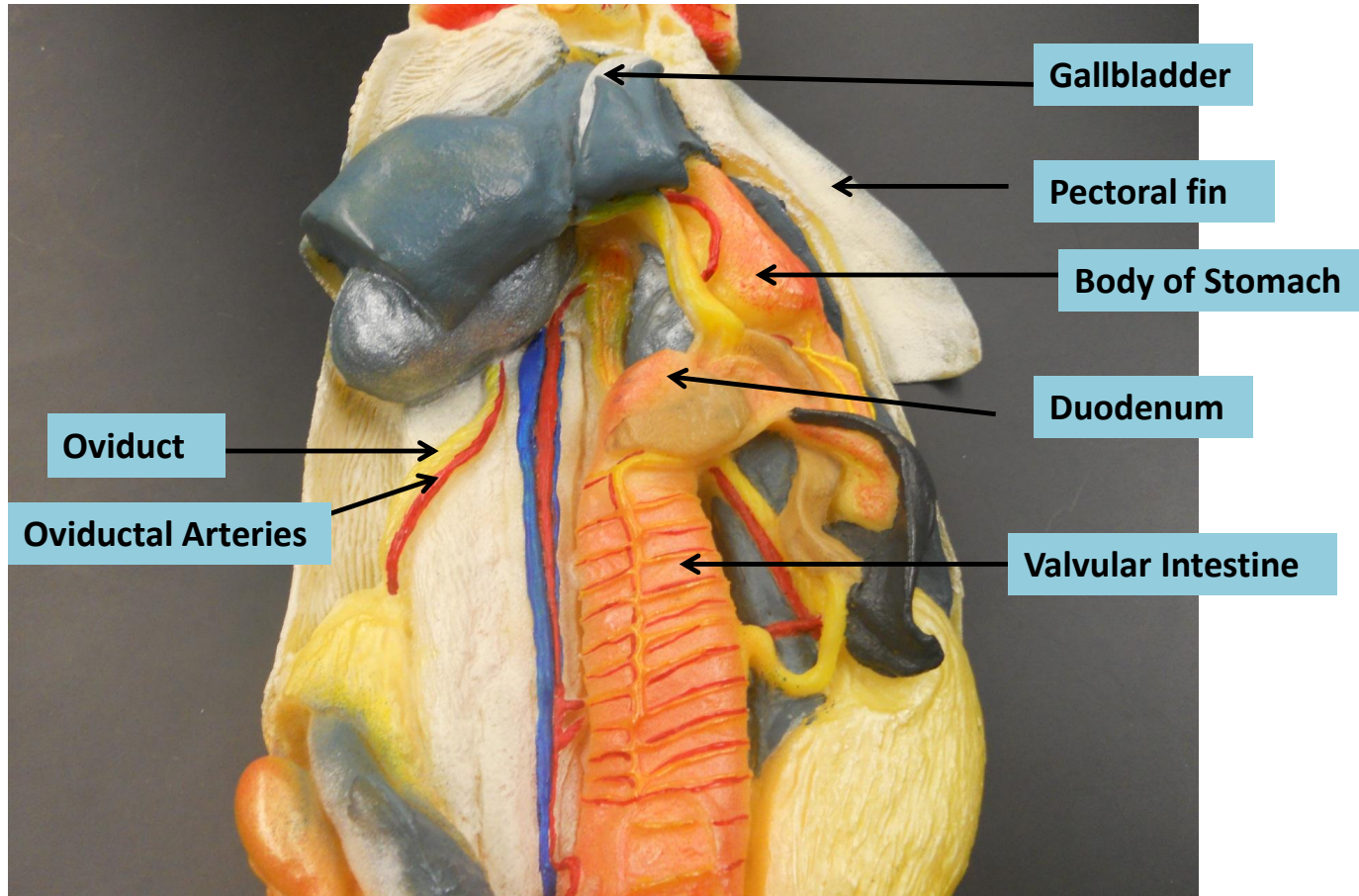
Spiny Dogfish Shark



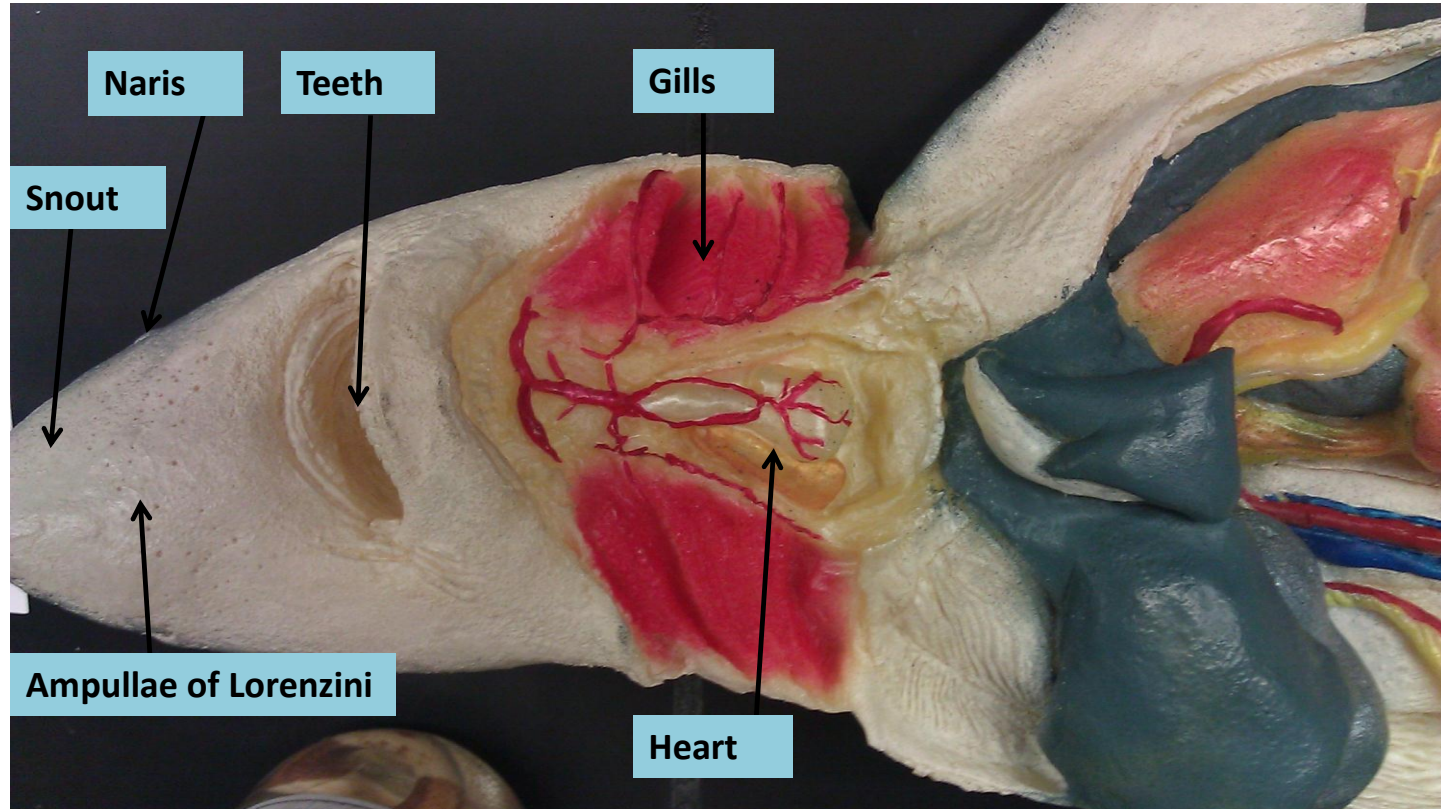
Spiny Dogfish Shark



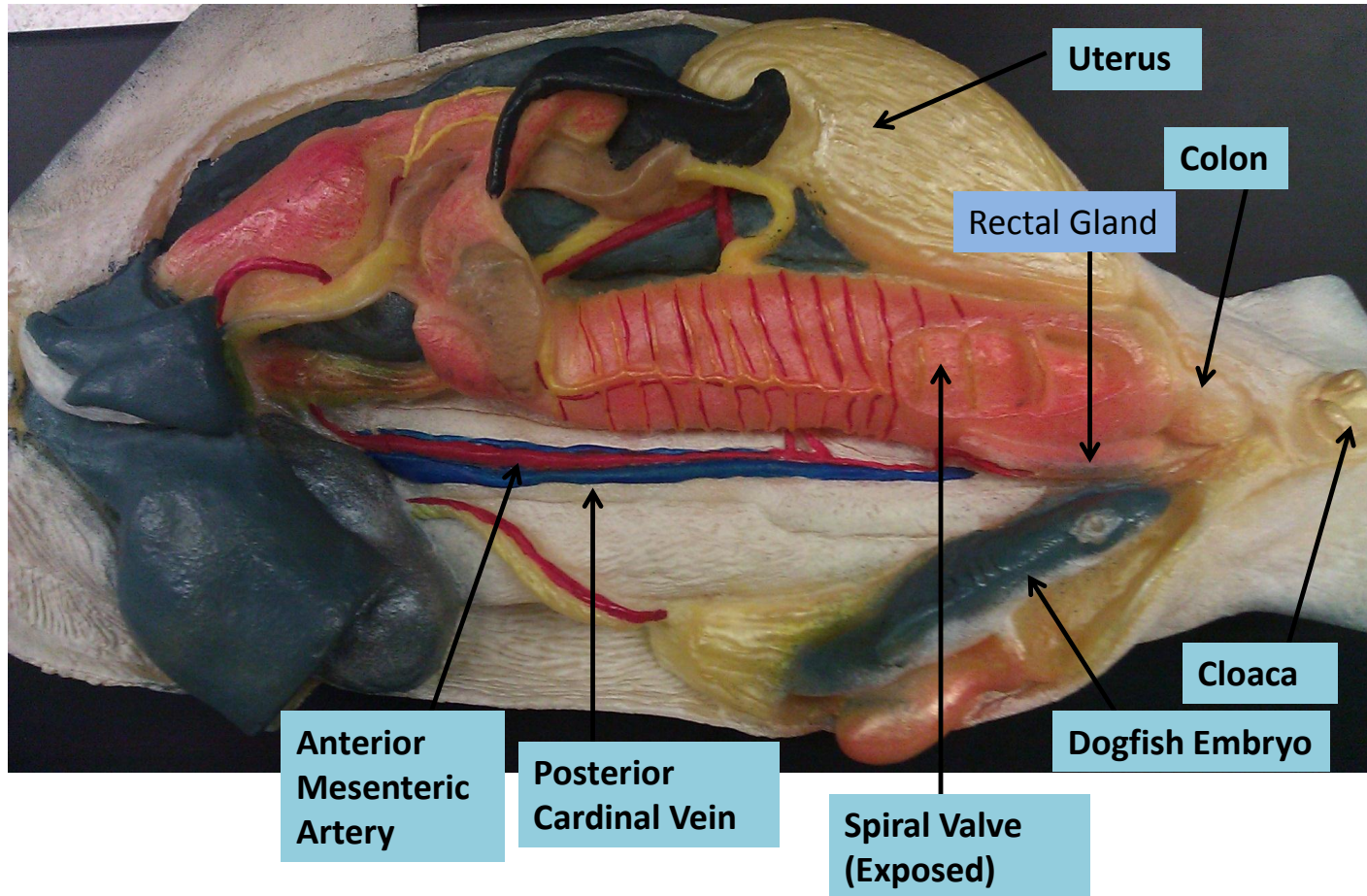
Spiny Dogfish Shark



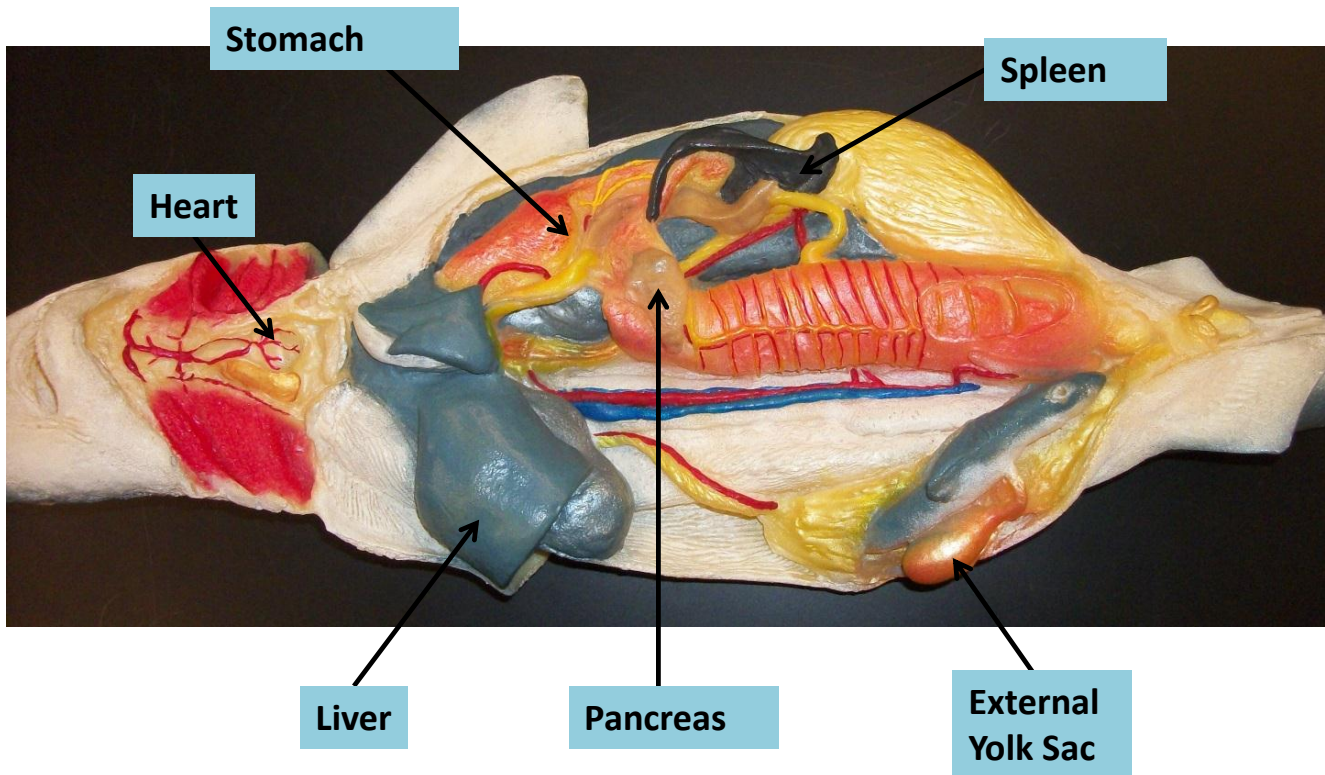
Spiny Dogfish Shark



Spiny Dogfish Shark



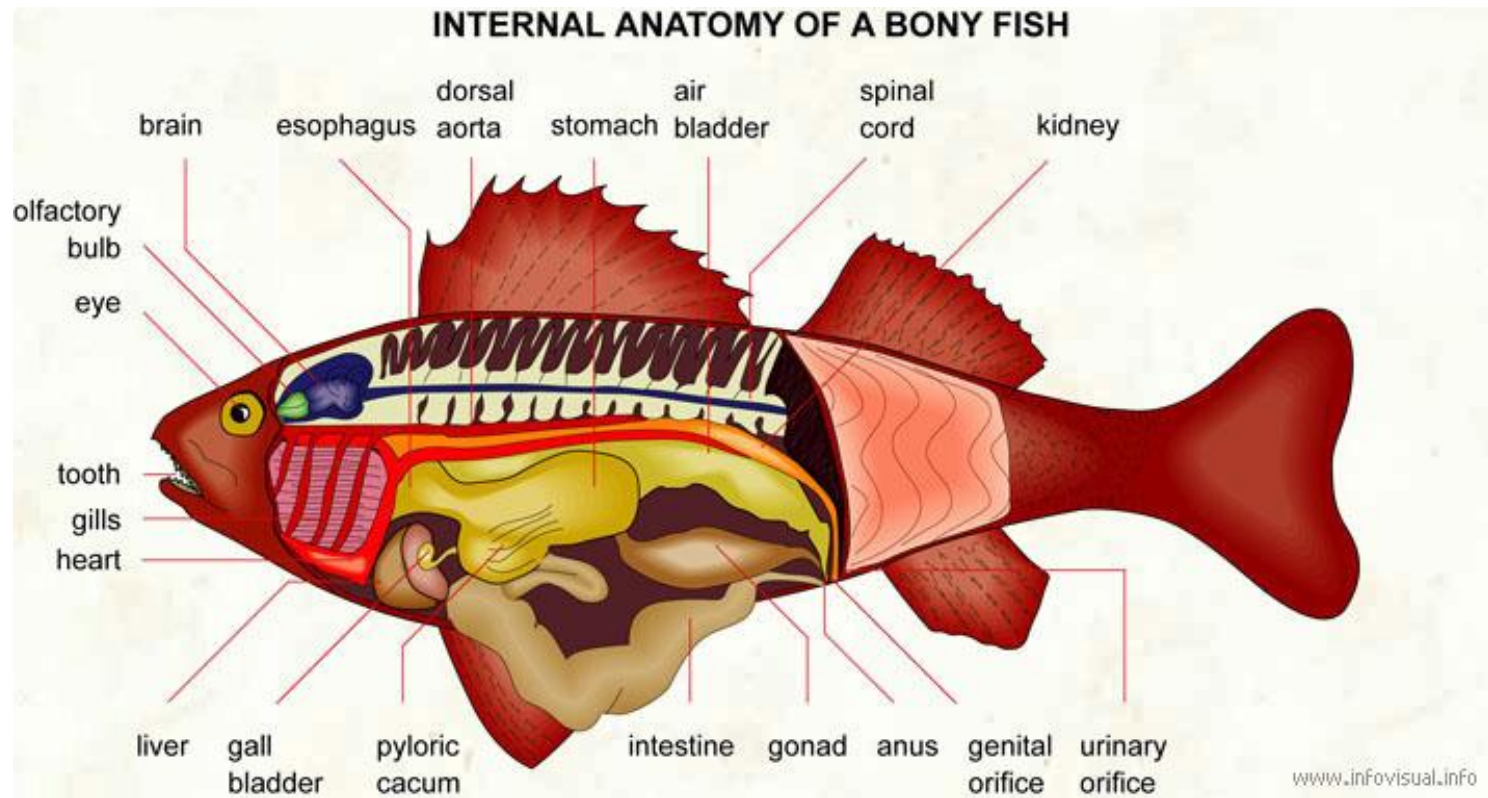
Spiny Dogfish Shark

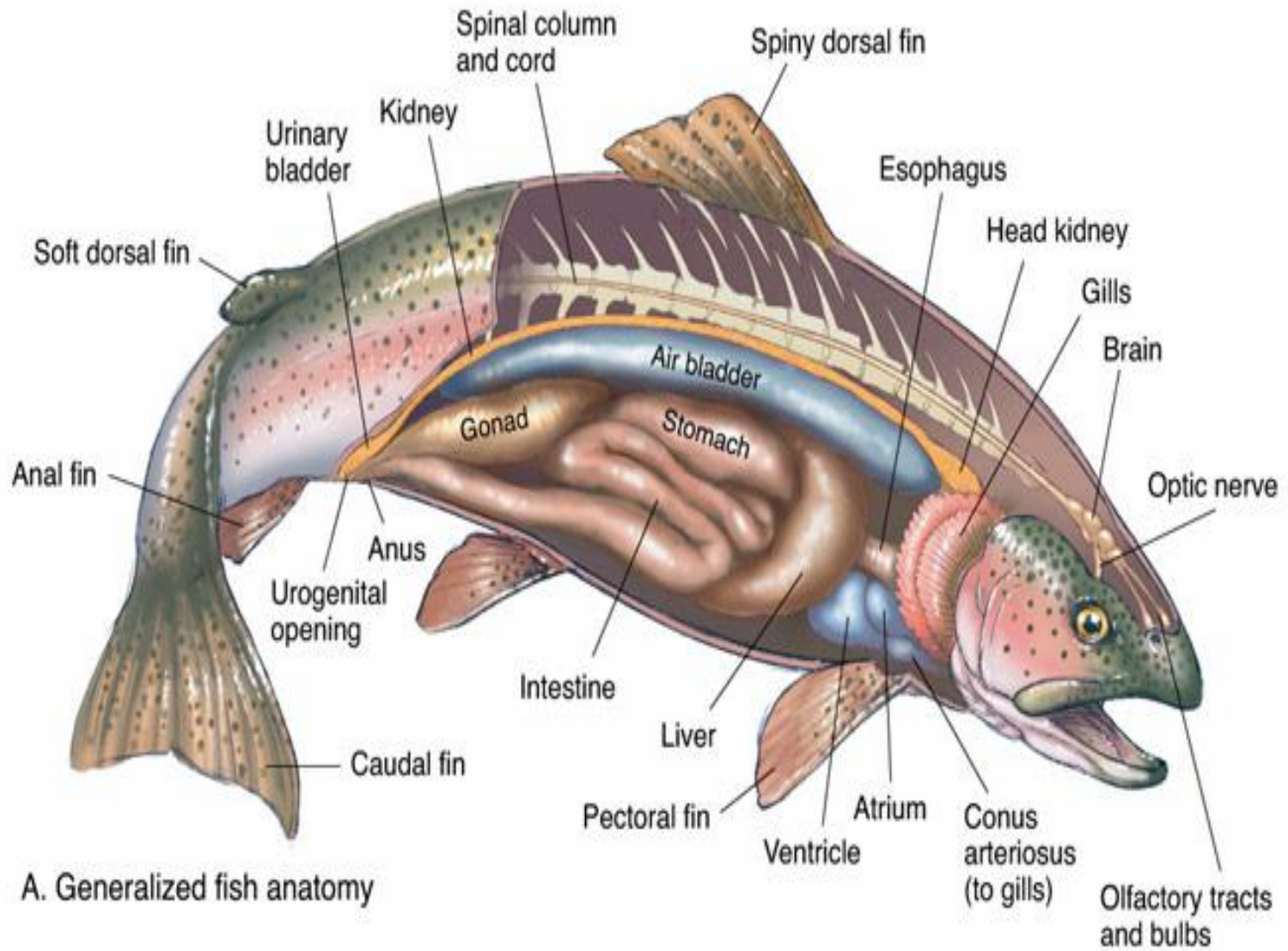


Superclass Osteichthyes

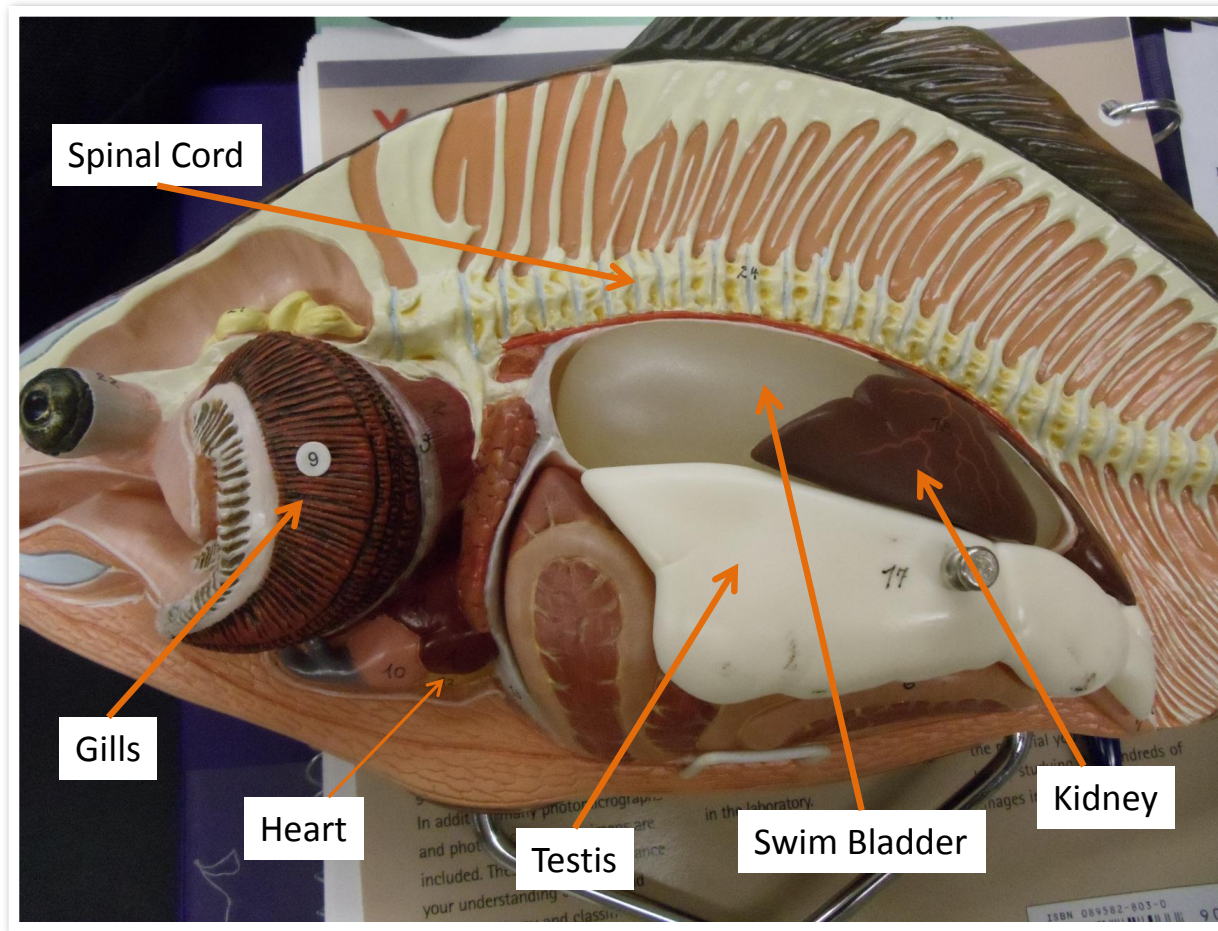
- Comprised of 3 classes
 - Actinopterygii : Rayfin fish
 - Actinista : Lobefin fish
 - Dipnoi : Lung fish
- All Osteichthyans have a bony, living skeleton
- Have Scales
- Are cold-blooded

Superclass Osteichtyes

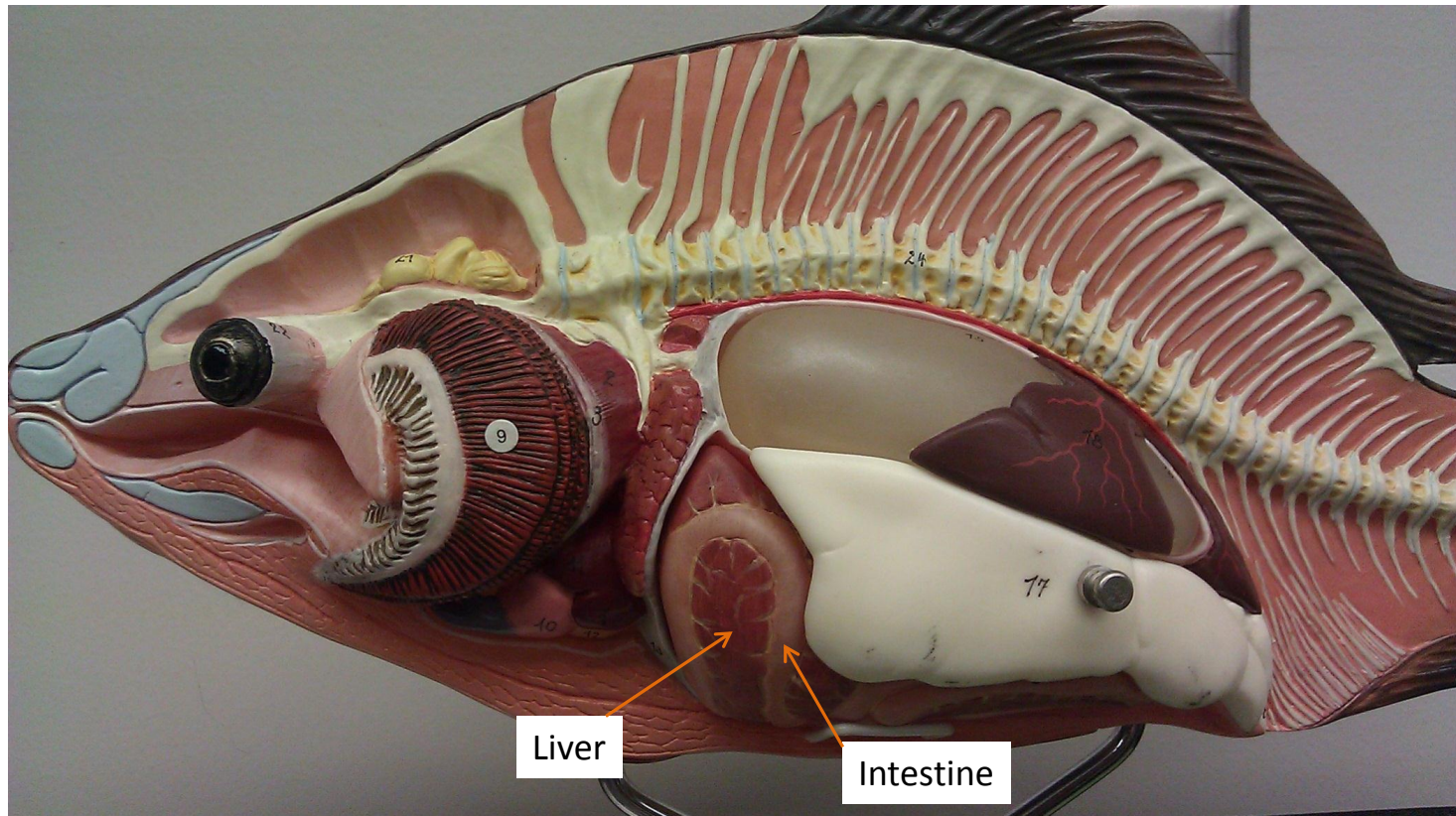




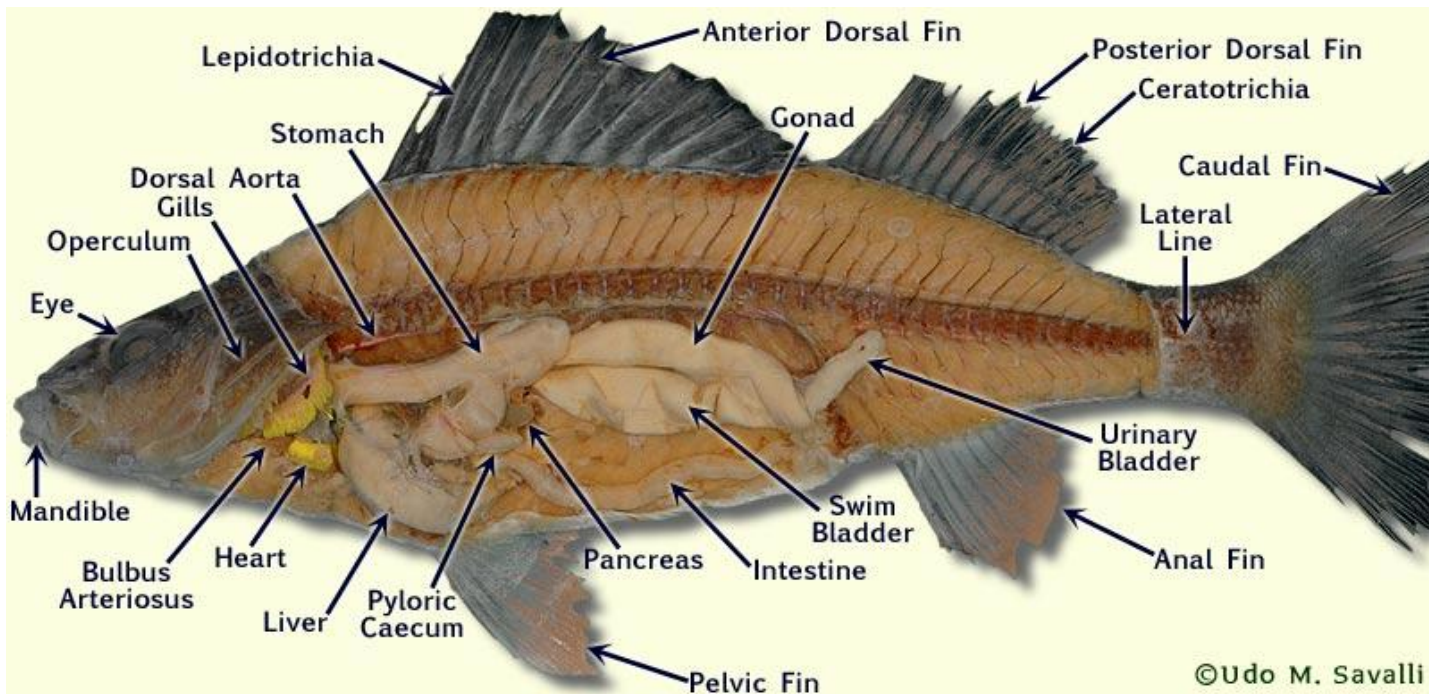
Carp – Class Actinopterygii



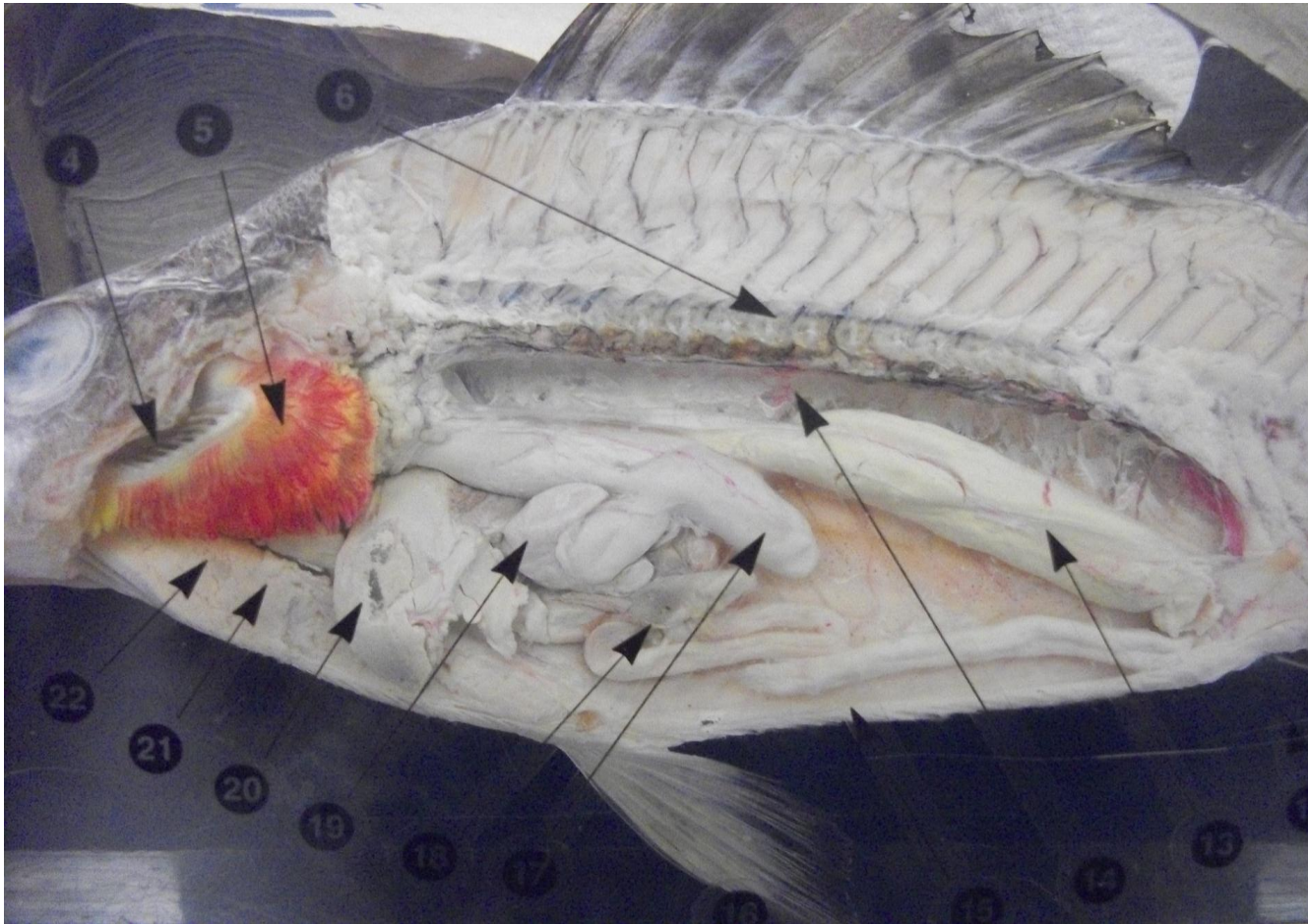
Carp – Class Actinopterygii



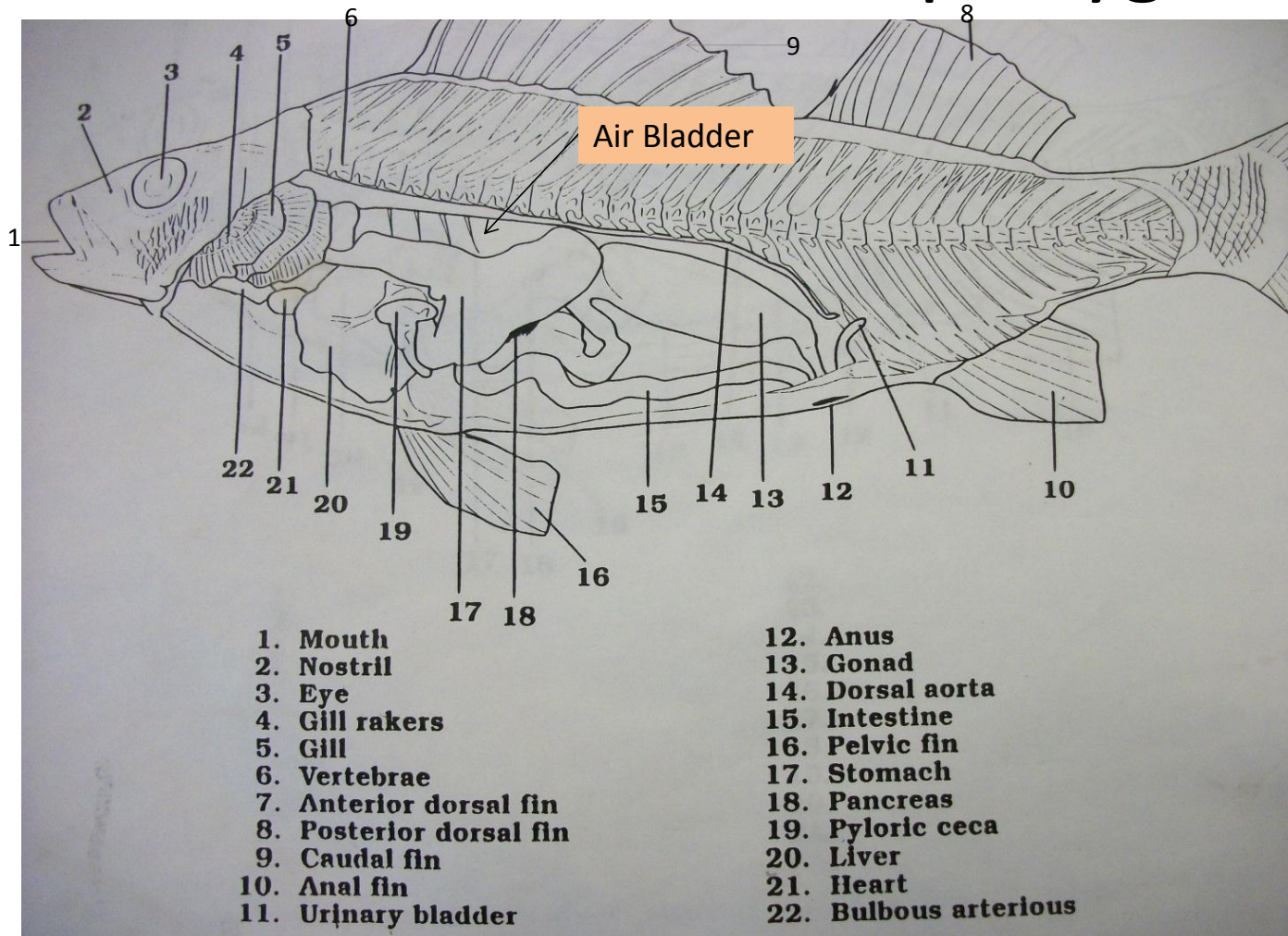
Yellow Perch - Actinopterygii



Yellow Perch - Actinopterygii



Yellow Perch - Actinopterygii

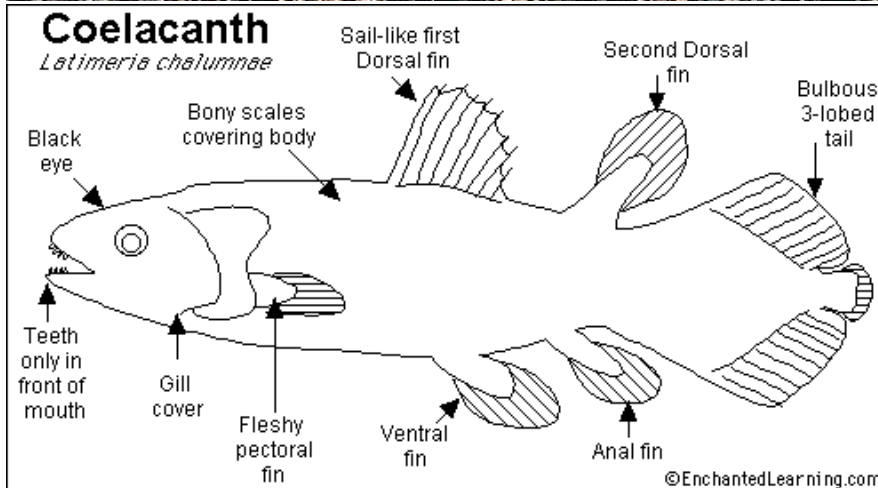


Class Actinista



Class Actinista – Lobe finned fish
Only remaining genus is Latimeria (coelacanths)

Have
Muscular bony fins
Vestigial lung



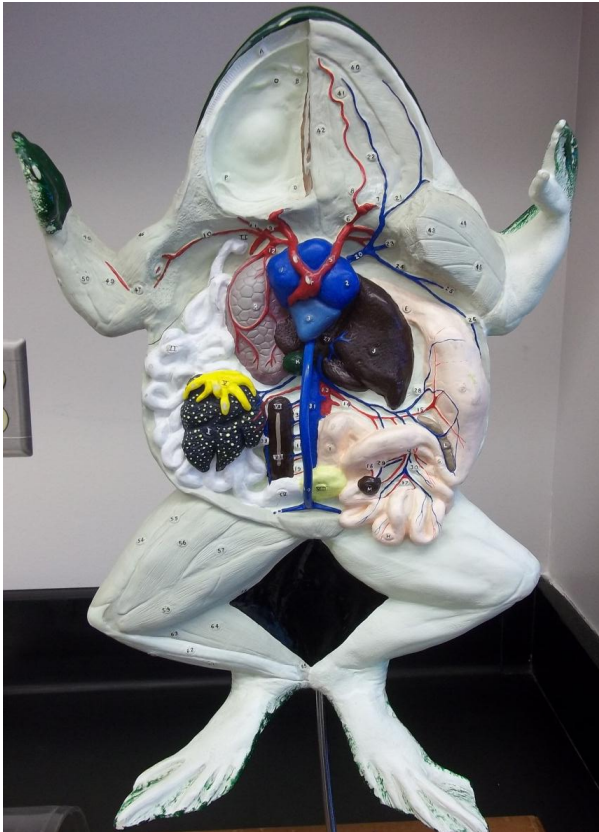
Class Dipnoi



Class Dipnoi – Lungfish

Lungfish Have
Functional Lungs
Modified fins

Class Amphibia



Class Amphibia - Frogs, Salamanders, Newts

Amphibians Have

Legs

Lungs – in adult

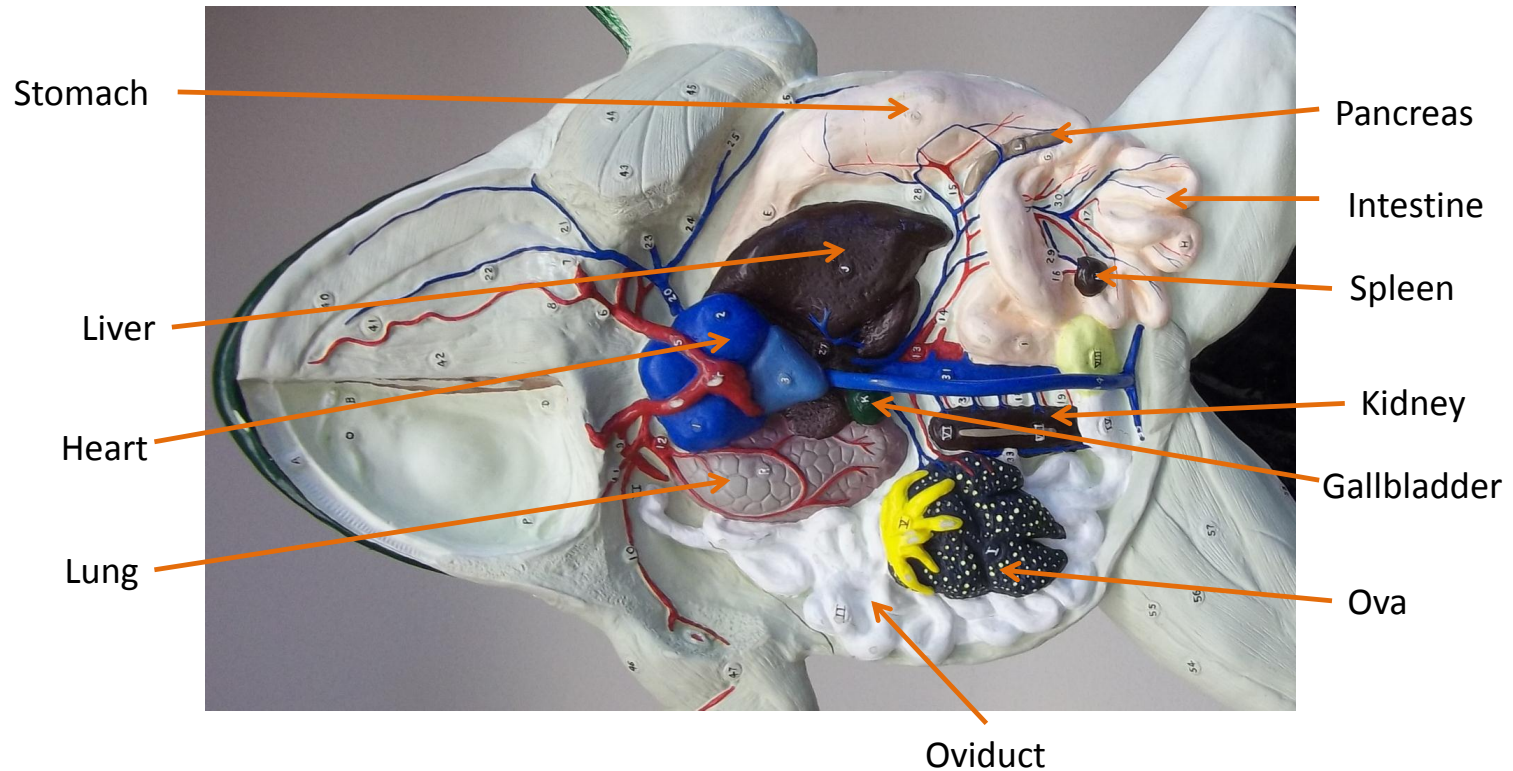
Gills – in tadpole

Breathe through skin

3 Chambered heart

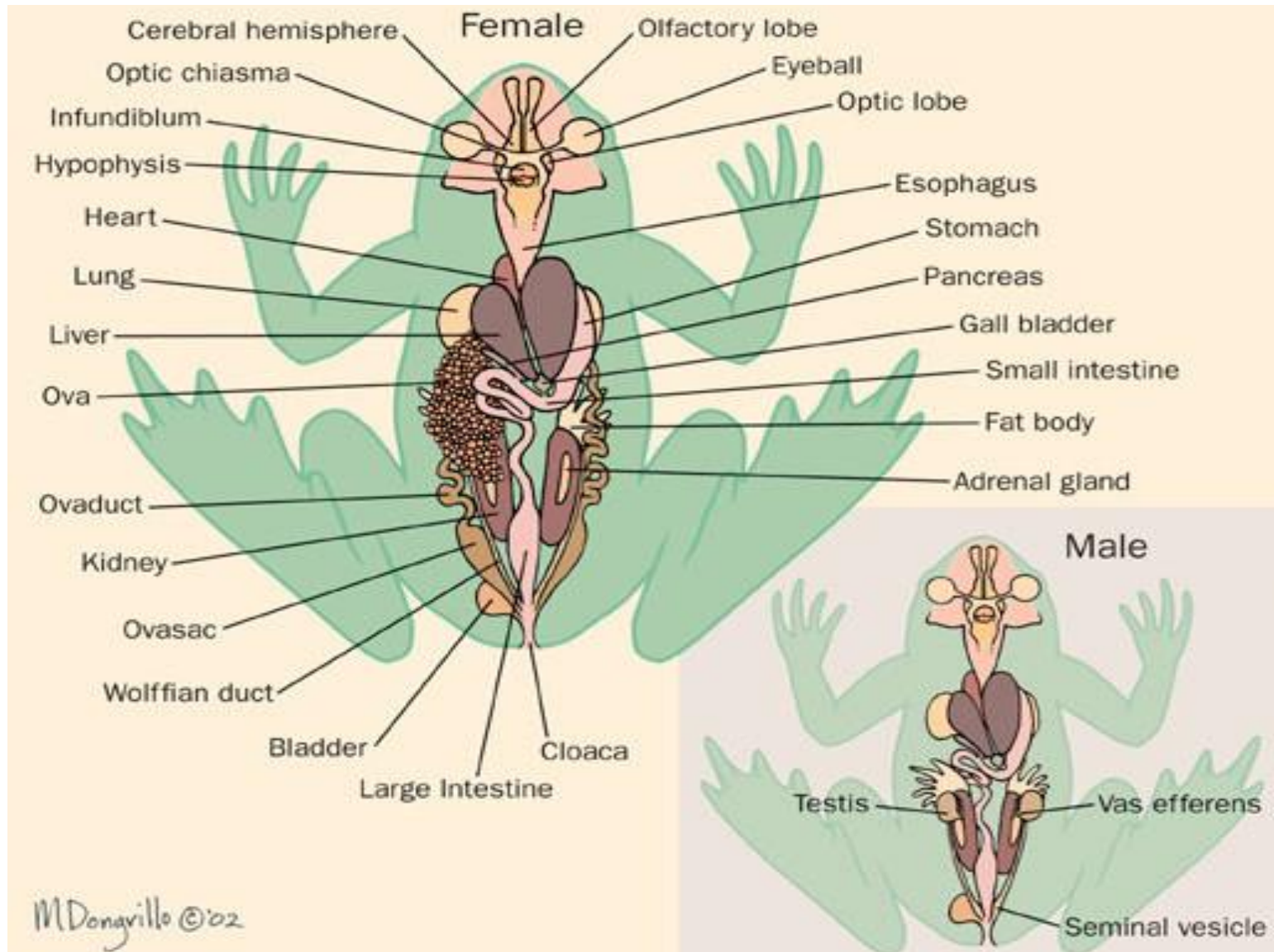
Cold-Blooded

Class Amphibia



Class Amphibia





Class Reptilia



Class Reptilia – Snakes, lizards, turtles, birds, dinosaurs (extinct)

Reptiles have

Scales

3 chambered heart with partial septum (complete in crocodilians and birds)

Cold-blooded (except for birds)

Class Reptilia



Sub-Class Aves



Sub-Class Aves – Birds, are part of reptilia, but are distinct from other reptiles

Birds Have

Feathers (modified scales)

4 Chambered Heart

Warm Blooded

Hollow Bones

Class Mammalia



Class Mammalia - Canines, Primates, Humans, Rhinos, etc.

Mammals Have

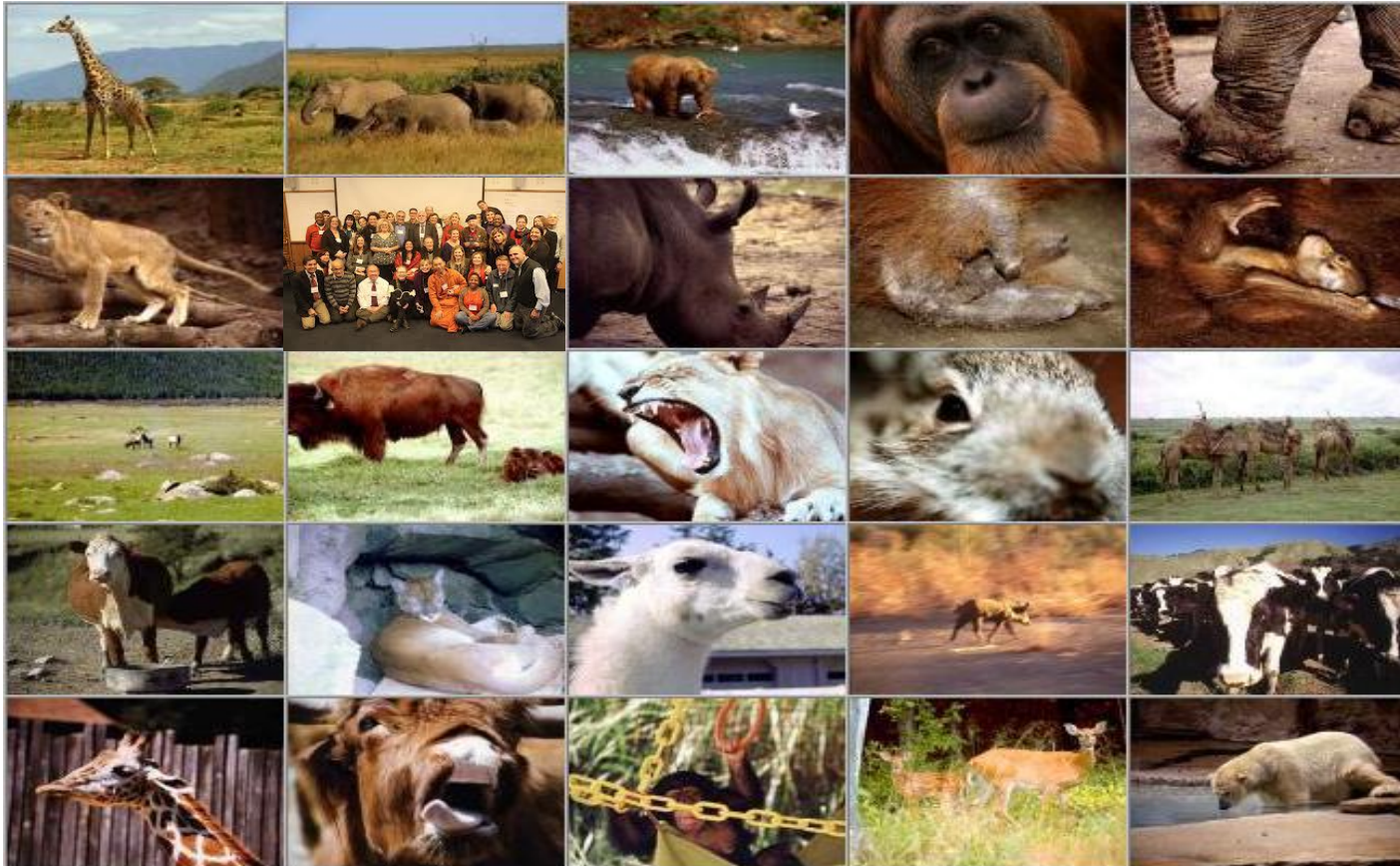
Hair

4 chambered heart

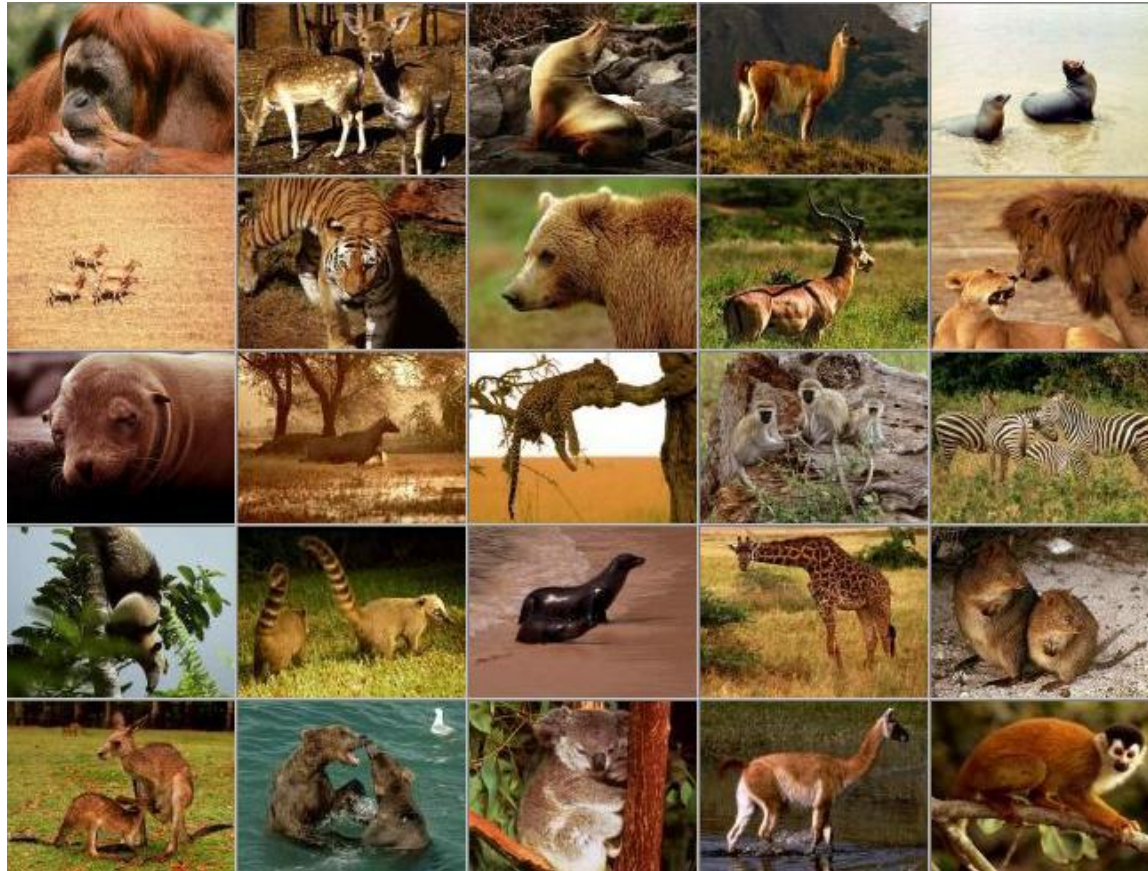
Milk

Warm-Blooded

Class Mammalia



Class Mammalia



Class Mammalia



Aardvark



Aardwolf



African Buffalo



African Elephant



African Wild Cat



Baboon



Bat-eared Fox



Black-backed Jackal



Black Rhinoceros



Blesbok



Blue Wildebeest



Brown Hyena



Bushbaby



Bushbuck



Bushpig



Cape Clawless Otter



Cape Hare



Cape Fox



Cape Fur Seal



Caracal



Cheetah



Civet



Common Dolphin



Common Duiker



Dassie



Dik-dik



Eland



Gemsbok



Giraffe



Ground Squirrel

Class Mammalia



Grey Rhebok



Grysbok



Hippopotamus



Hedgehog



Honey Badger



Impala



Klipspringer



Kudu



Leopard



Lion



Nyala



Oribi



Panqolin



Porcupine



Red Hartebeest



Reedbuck



Roan Antelope



Sable Antelope



Serval



Side-striped Jackal



Slender Mongoose



Southern Right Whale



Spotted Genet



Spotted Hyena



Springbok



Springhare



Steenbok



Suricate Family



Tsessebe



Vervet Monkey



Warthog



Waterbuck



White Rhinoceros



White-tailed Mongoose

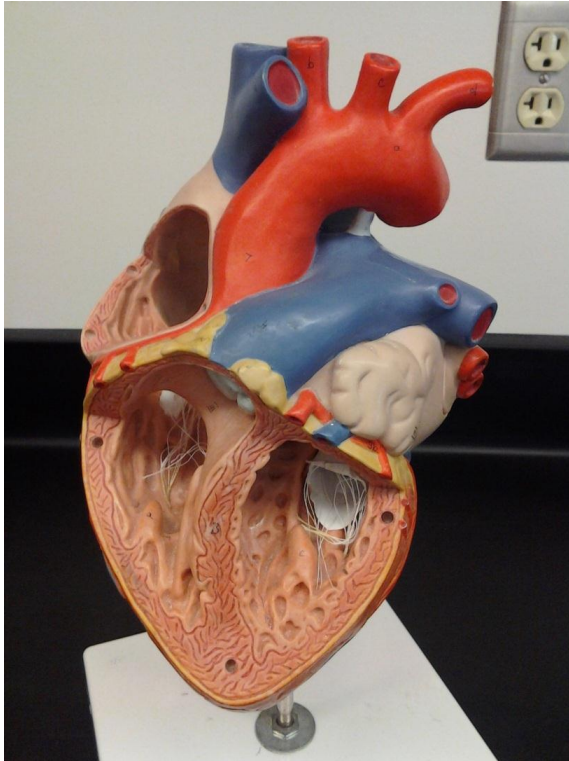


Wild Dog



Zebra

Circulation – The Heart



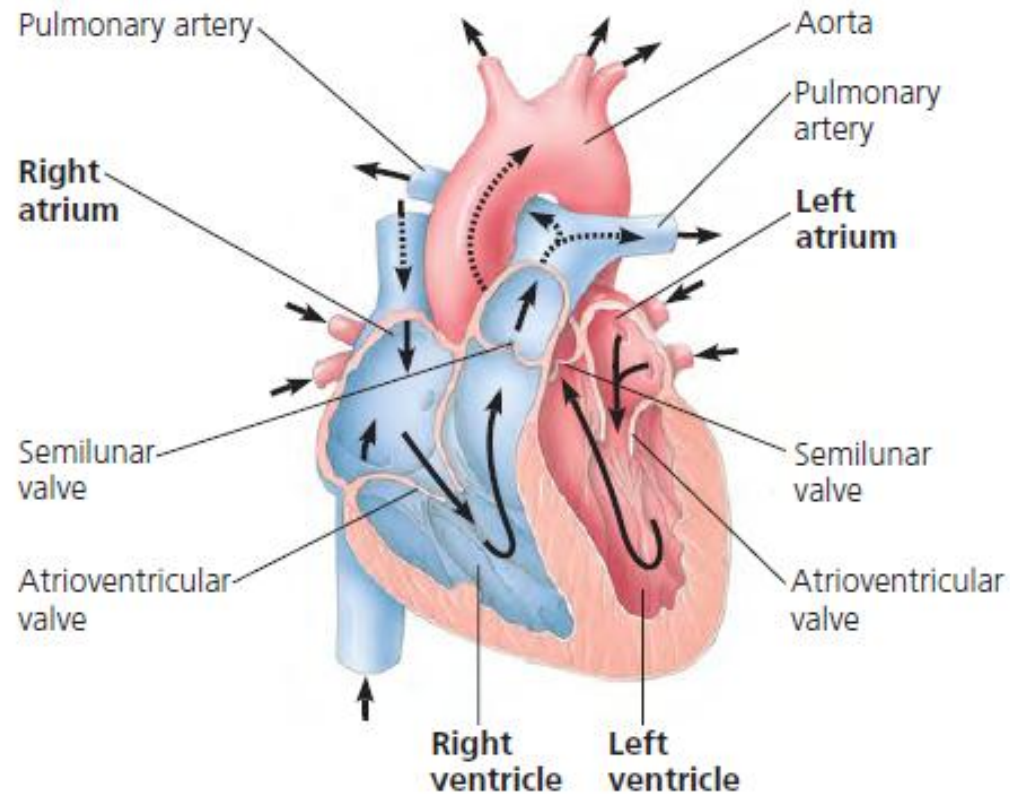
The Mammalian Heart

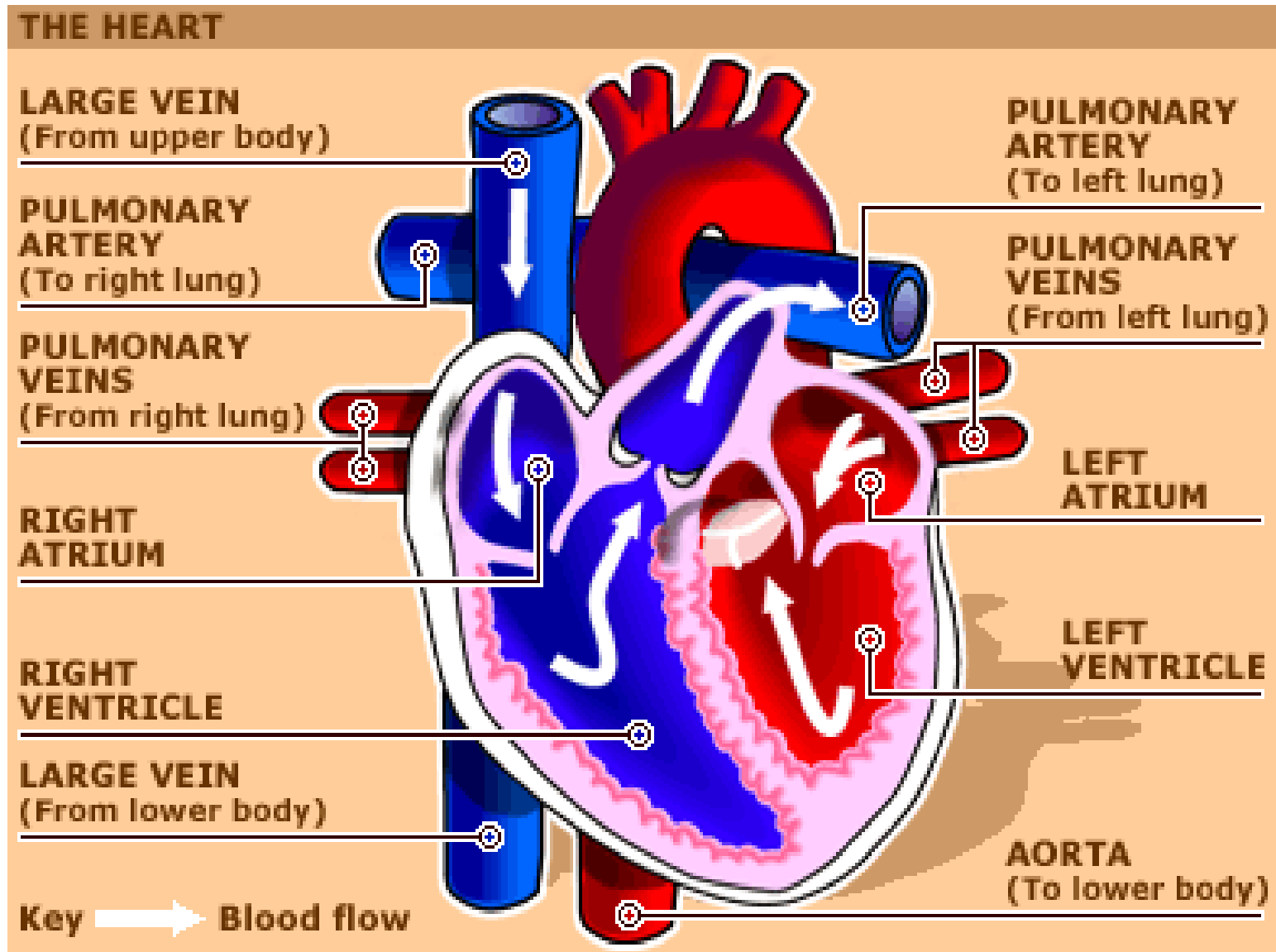
4 Chambers – Right and left Atrium and right and left ventricles

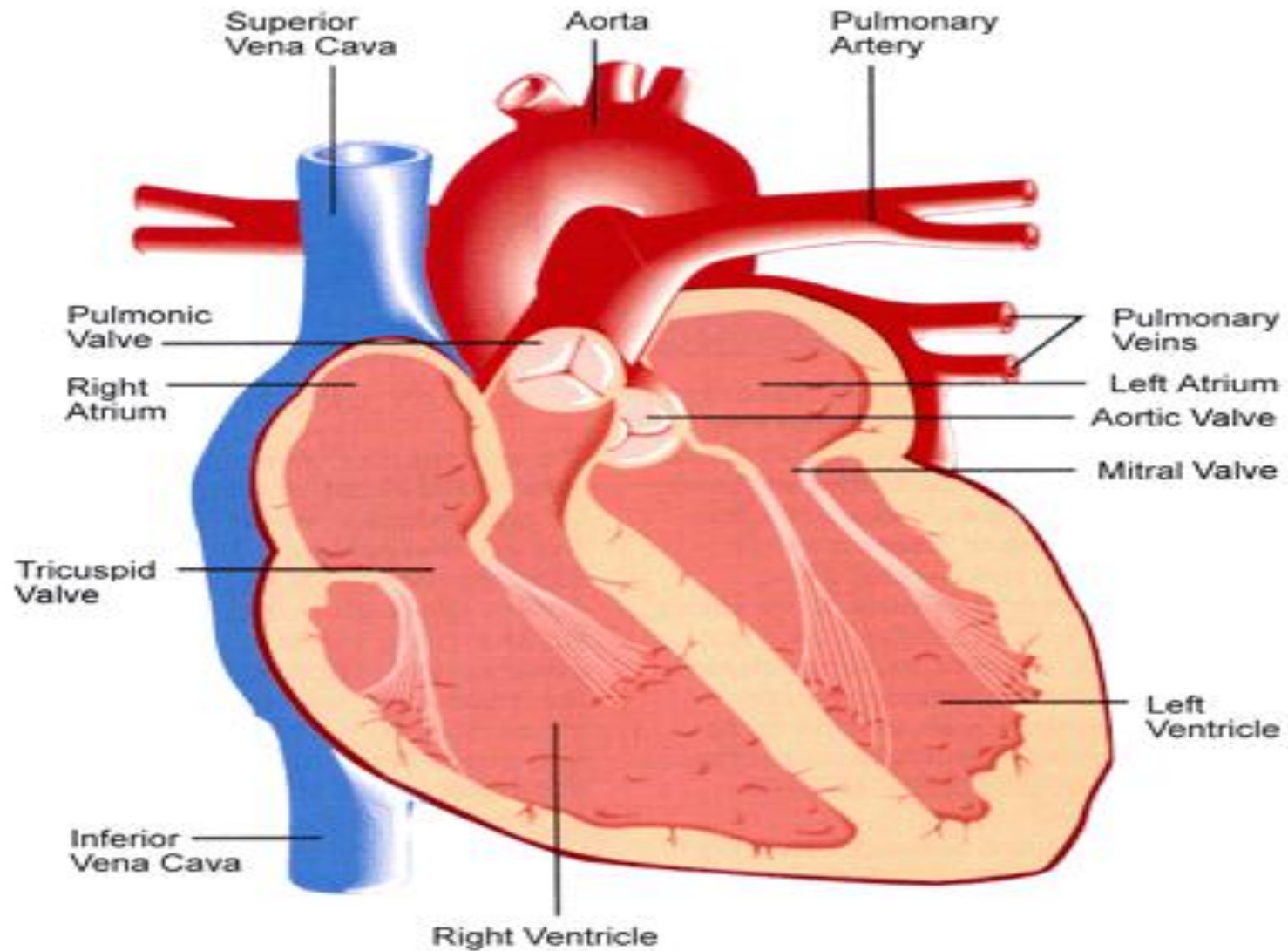
2 Atrioventricular Valves – Tricuspid and Bicuspid

Two Semilunar Valves – Aortic and Pulmonary

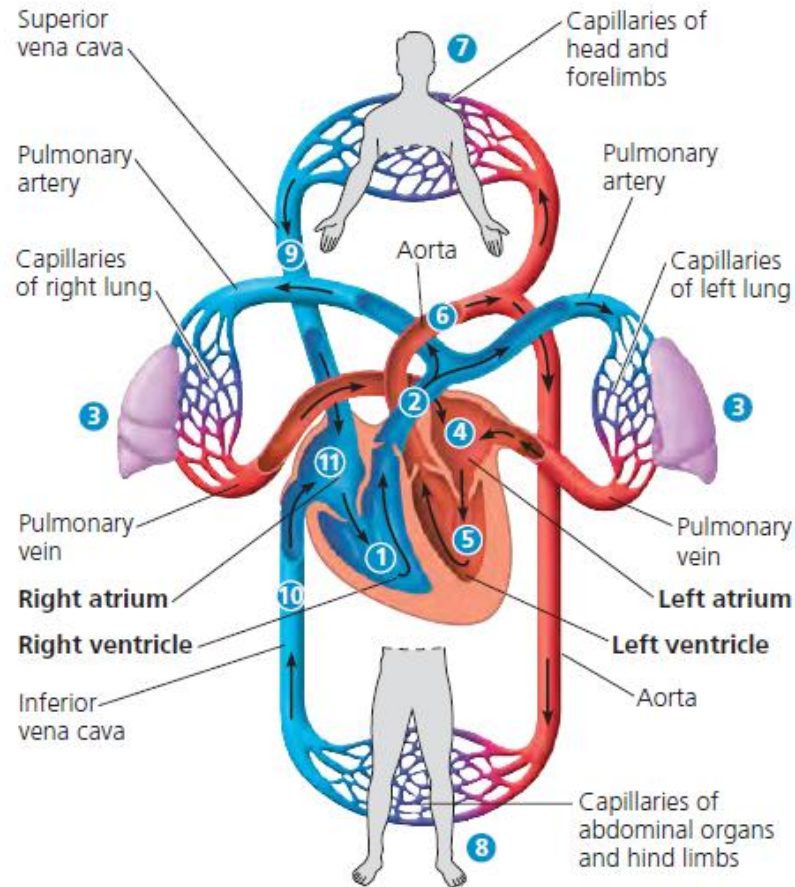
Circulation





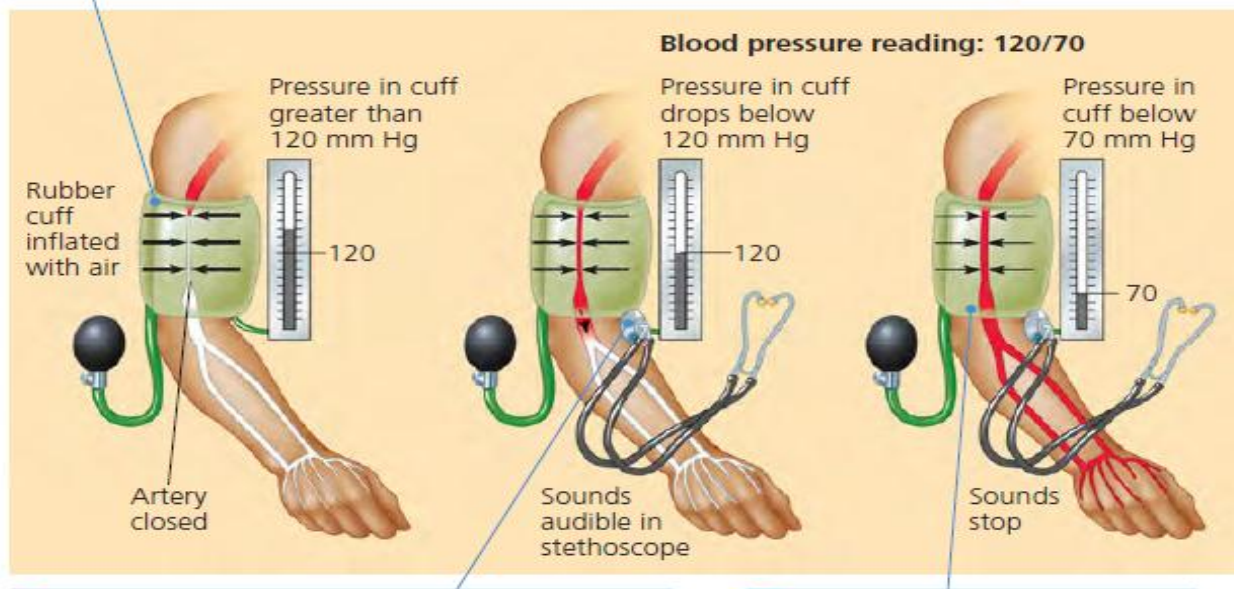


Circulation



Blood Pressure

① A sphygmomanometer, an inflatable cuff attached to a pressure gauge, measures blood pressure in an artery. The cuff is inflated until the pressure closes the artery, so that no blood flows past the cuff. When this occurs, the pressure exerted by the cuff exceeds the pressure in the artery.



② The cuff is allowed to deflate gradually. When the pressure exerted by the cuff falls just below that in the artery, blood pulses into the forearm, generating sounds that can be heard with the stethoscope. The pressure measured at this point is the systolic pressure.

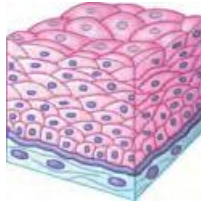
③ The cuff is allowed to deflate further, just until the blood flows freely through the artery and the sounds below the cuff disappear. The pressure at this point is the diastolic pressure.

Tissue Types

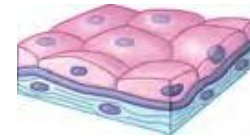
- Epithelial Tissue
 - Covers the outside of the body and lines organs and body cavities
 - Squamous, Cuboidal, Columnar
 - Simple, Stratified, Pseudostratified
- Connective Tissue
 - Sparse population of cells scattered through extracellular matrix
 - Bone, Blood, Cartilage, Fibrous, Loose, Adipose,
- Muscle Tissue
 - Contracts
 - Skeletal, Smooth, Cardiac
- Nervous Tissue
 - Receive, process and transfer information
 - Neurons, Glia

Epithelial Tissue

Stratified Squamous – multilayered, regenerates rapidly, found in harsh environments in/on the body



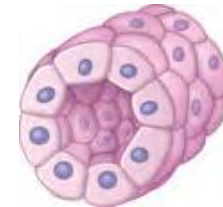
Simple Squamous – single layer of flat cells, found in capillaries



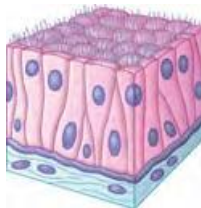
Simple Columnar – single layer of tall column-like cells, found in intestines



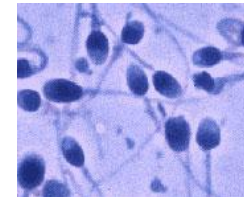
Simple Cuboidal – single layer of cube-shaped cells, found in kidneys and glands



Pseudostratified Columnar – squished and abnormally shaped columnar cells, usually ciliated, found in upper respiratory tract

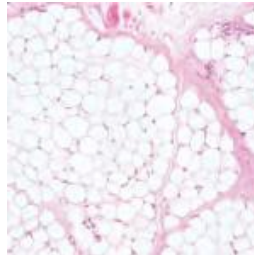


Reproductive Cells – sperm and egg cells are haploid gametes

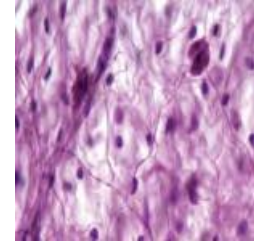


Connective Tissue

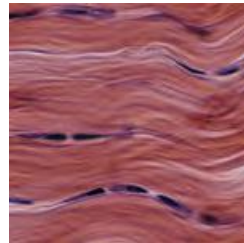
Adipose— Cells contain a large fat droplet, used for energy storage



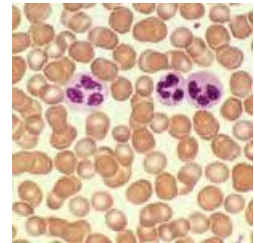
Loose/Areolar - binds epithelia and organs in place, has loosely connected fibers



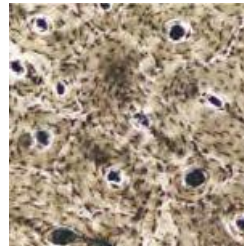
Fibrous – dense with collagenous fibers, found in tendons and ligaments



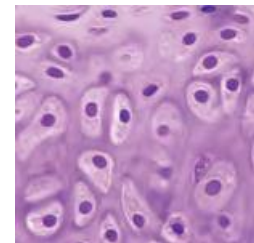
Blood – made up of plasma, erythrocytes, leukocytes and platelets, carries nutrients and wastes



Bone – Osteocytes, osteoblasts, and osteoclasts suspended in an extracellular matrix of hard calcium

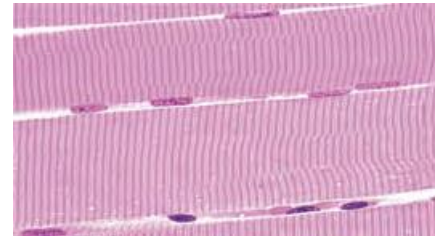


Cartilage – chondrocytes secrete a rubbery matrix of collagen and chondroitin sulfate, found in joints

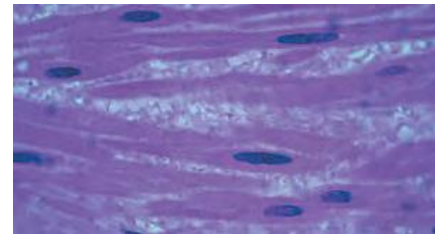


Muscle Tissue

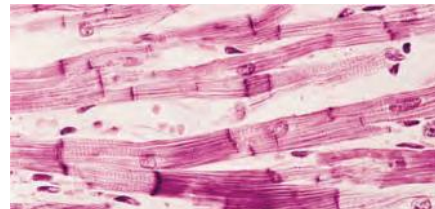
Skeletal Muscle – Bundles of long, un-branched, striated cells, responsible for voluntary movement, made up of sarcomeres



Smooth Muscle – non-striated and spindle shaped, responsible for involuntary activity of things like the stomach and constriction/dilation of arteries



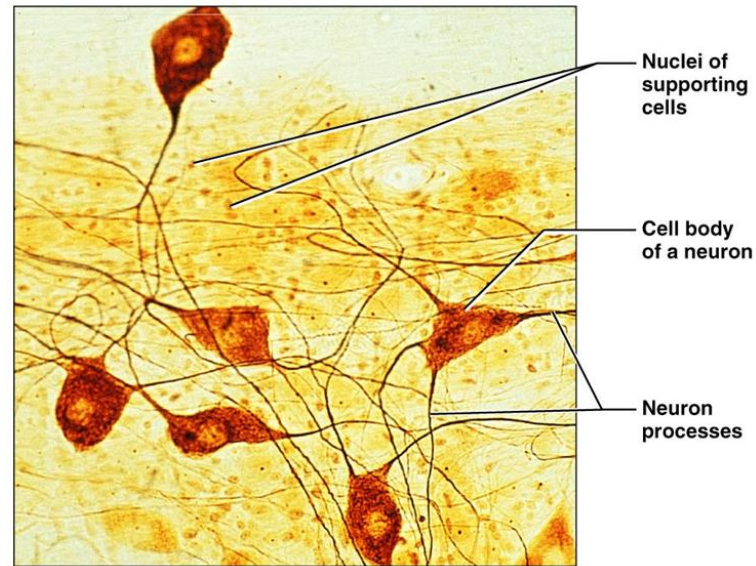
Cardiac Muscle – branched and striated, has intercalated disks to help transfer of electrical signals, found only in the heart, responsible for contraction of the walls of the heart



Nervous Tissue

Neurons – Receive and transmit signal throughout the body via the nervous system. Have dendrites for receiving impulses from other nerve cells and axons for sending out impulses to other cells

Glia – cells that support, nourish, and insulate the neurons



Photomicrograph: Neurons (100x)



DAYTONA STATE COLLEGE

Questions



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<http://www.daytonastate.edu/asc/ascsiencehandouts.html>