

## Animals 5

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- send answer to iClicker Question 20A now.
- Starfish II
- Chordates
  - in general
  - phylogeny
  - trout
- iClicker Question 20B

Due in lab **next** week:

⇒ Animal Diversity Pre-lab (Lab manual page 103 & on-line)

⇒ Plant Diversity Lab report

Don't forget the Phylogenetic Collection Lab

Exam 2: Monday (info in Animals 3 handout)

- Last names A - G in McCormack Cafe
- Last names H - Z here (1 bonus point for going to correct place!)

Final Exam Wednesday May 19 11:30 - 2:30

# Starfish



Starfish, continued

motion = tube-feet & water-vascular system (also does circulation)

respiration: tube-feet used as gills

reproduction: asexual - can re-grow arms & sometimes disc

sexual ♀, ♂ spawn: seasonal conditions trigger mass release of eggs: sperm into  $H_2O \rightarrow$  fertilization

life cycle: zygote  $\rightarrow$  swimming embryo  $\xrightarrow{\text{metamorphosis}}$  juvenile starfish  $\xrightarrow{\text{grows}}$  adult

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Chordates - bilateral symmetry & 4 distinguishing characteristics:

notched tail, notched tail, rod, notched tail, notched tail, notched tail, notched tail, notched tail

① notochord - cartilage<sup>rod</sup> running along dorsal side (NOT a backbone)

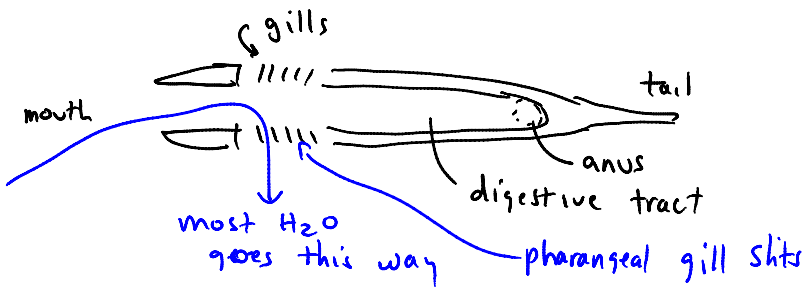
- major groups {
- urochordata - notochord only in larva
  - cephalochordata - notochord only
  - vertebrata = notochord + "backbone" around ②

② single dorsal nerve cord

③ post-anal tail = anus not at tip of tail

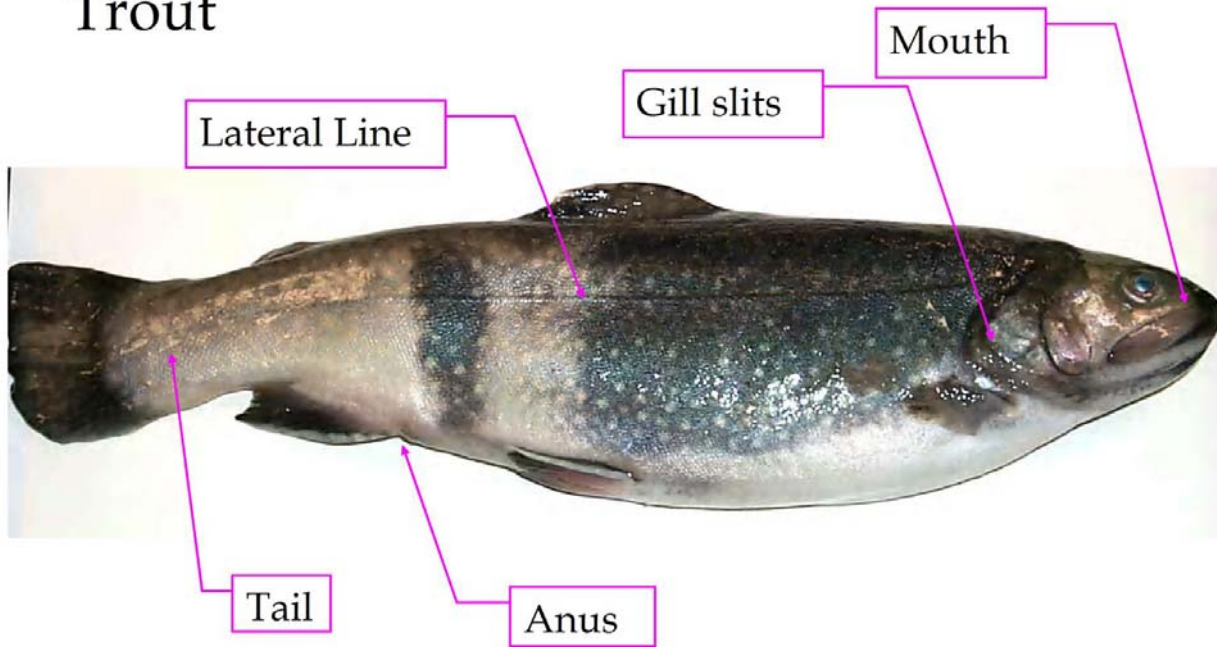
④ pharyngeal gill slits ("breathe thru mouth")

ex. in fish dorsal view looking down @ inside



\* closed in land-dwelling chordates

# Trout



## Bio 112 Handout for Animals 5

This handout contains:

- Today's iClicker Questions
- Handout for today's lecture

### iClicker Question #20A - before lecture

Which of the following are true?

- (A) All chordates have a backbone made of bone and cartilage.
- (B) All chordates have a dorsal nerve cord.
- (C) All chordates have a backbone made of bone and/or cartilage.
- (D) More than one of the above.
- (E) None of the above.

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### iClicker Question #20B - after lecture

Which of the following animals eats (ingests food) and breathes (takes in air or water for respiration) through their mouth?

- (A) trout
- (B) squid
- (C) caterpillar
- (D) planarian
- (E) more than one of the above

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#### **Beaming in your answers**

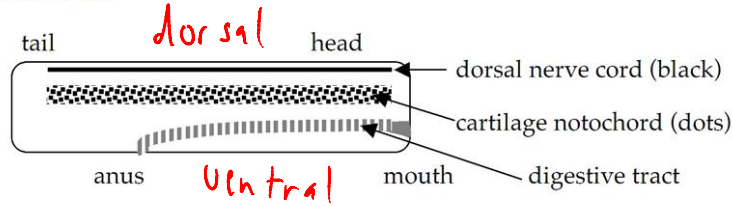
1. Figure out your answer and select the appropriate letter (A-E).
2. Turn on your iClicker by pressing the "ON/OFF" button; the blue "POWER" light should come on. If the red "LOW BATTERY" light comes on, you should replace your batteries soon.
3. Transmit your answer as follows:
  - a. Press the button corresponding to the answer you've selected (A thru E).
  - b. The "STATUS" light will flash green to indicate that your answer has been received. If the "STATUS" light flashed red, your answer was not received; you should re-send it until you get a green "STATUS" light.

# Notochord, backbone, etc.

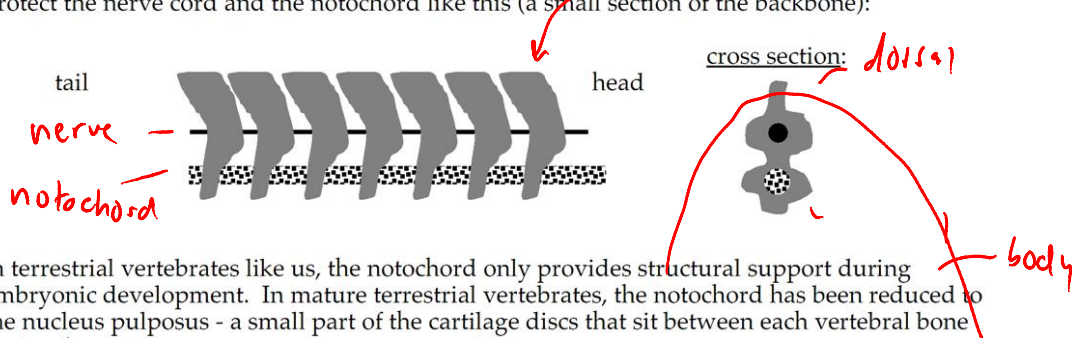
These terms can be confusing as these structures are highly modified in advanced vertebrates like us.

There are two parts of the primitive chordate (for example, a cephalocordate) to keep track of:

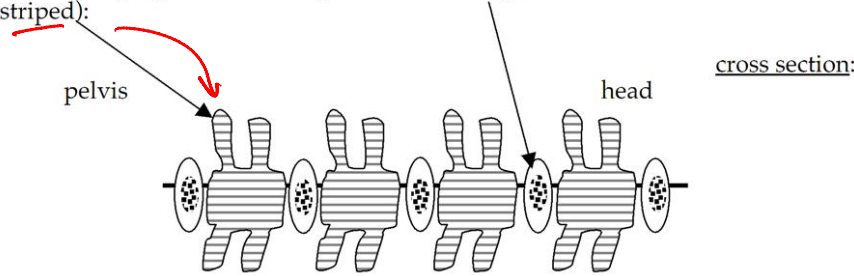
- the nerve cord
- the notochord



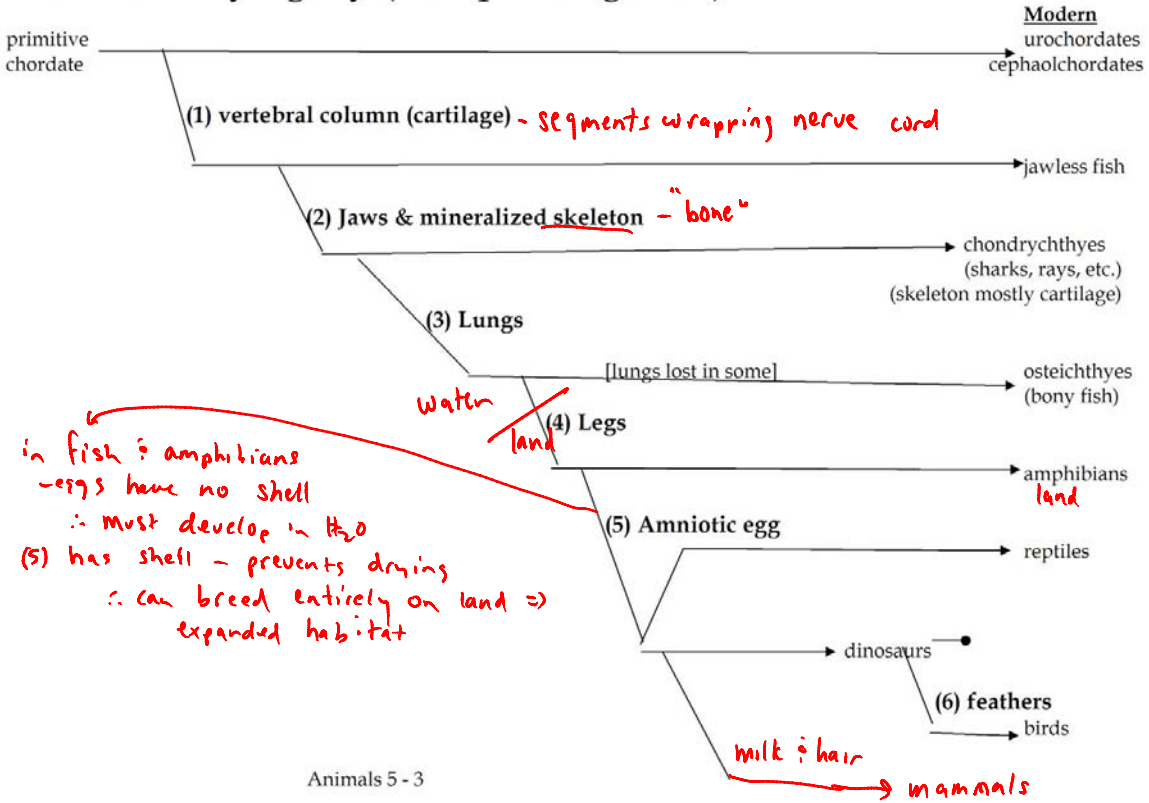
In more advanced chordates, like a shark, cartilage 'vertebrae' (gray) begin to wrap and protect the nerve cord and the notochord like this (a small section of the backbone):



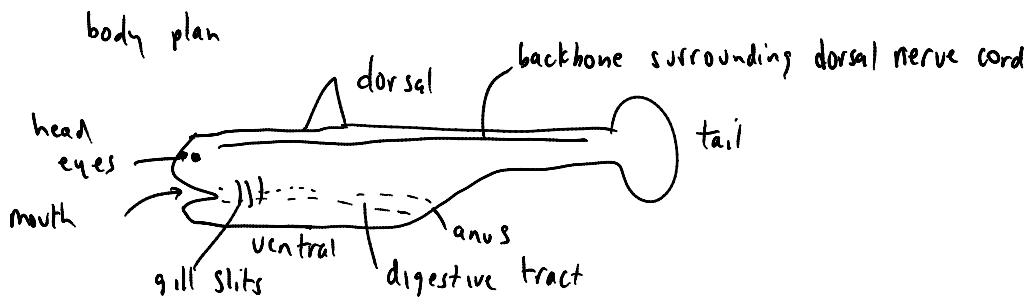
In terrestrial vertebrates like us, the notochord only provides structural support during embryonic development. In mature terrestrial vertebrates, the notochord has been reduced to the nucleus pulposus - a small part of the cartilage discs that sit between each vertebral bone (striped):



# Chordate Phylogeny (Campbell fig. 34.2)



Trout: phylum chordata deuterostome habitat: fresh H<sub>2</sub>O  
 - class osteichthyes (bony fish - have bones)



Structure: bone skeleton + hydrostatic

nervous: complex with eyes & brain

eats - fish, etc

reproduction: - sexual only ♀, ♂ spawning  
 eggs develop outside of ♀