**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**FISH (and chordates) NOTES**:

**What is a chordate?**

* Members of the \_\_\_\_\_\_\_\_\_\_\_ Kingdom and the Phylum \_\_\_\_\_\_\_\_\_\_.
* They have a \_\_\_\_\_\_\_\_\_\_, hollow \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ and a \_\_\_\_\_\_\_\_\_\_.(primitive spinal chord)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pouches (become gills)
* \_\_\_\_\_ -- extends beyond the anus

Most chordates are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(Subphylum Vertebrata)

Chordates that are NOT vertebrates: \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_.

**Chordate Anatomy**



**What is a vertebrate?**

* Animals with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or vertebral column

( \_\_\_\_\_\_\_\_\_\_\_\_\_\_)

* Have a spinal cord ----dorsal, hollow nerve cord
* Front end of spinal cord develops a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Vertebrate Classes**

* Jawless Fish ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Cartliage Fish ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Bony Fish ex. \_\_\_\_\_\_\_\_\_\_ , \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Amphibians ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Reptiles ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Birds ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Mammals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**What are Fish?**

* Anything with \_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_...
* 1st Fish were \_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ ----“Age of Fishes” 

**Form & Function**

**Circulation**:



Fish have a \_\_\_\_\_\_ chambered heart ----- blood is passed over the \_\_\_\_\_\_\_\_ where it picks up \_\_\_\_\_\_\_\_\_\_\_\_.

**Respiration:**

* Water passes over \_\_\_\_\_\_\_, oxygen is added
* Some fish have gill covers called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Some fish have special organs to serve as \_\_\_\_\_\_\_\_\_\_\_\_ (Lungfish)

**Excretion:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: maintaining water balance
* Salt water fish tend to \_\_\_\_\_\_\_\_\_ water
* Fresh water fish tend to \_\_\_\_\_\_\_\_\_ water
* This is why you can’t put a salt water fish in a fresh water tank.
* The Salmon can do both.

**The Nervous System:**

Response

* \_\_\_\_\_\_\_\_\_\_\_\_---thinking, voluntary activities.
* \_\_\_\_\_\_\_\_\_\_\_\_---Coordination.
* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ --functions of internal organs.
* \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ -- senses vibrations.

**Other Fish Adaptations:**

Fish fins help \_\_\_\_\_\_\_\_\_\_\_\_\_ the fish and \_\_\_\_\_\_\_\_\_\_\_ it forward.

\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ ---- maintains \_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( like a balloon)

**LABEL the Fins:**



**Reproduction:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-- fish lay eggs that are fertilized externally
* Some fish bear \_\_\_\_\_\_\_ young
* Oviparous (\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_)
* Ovoviviparous ( \_\_\_\_\_\_\_ \_\_\_\_\_ \_\_ \_\_\_\_\_\_)
* Viviparous (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Ex. Humans, cats, some fish)