

## Chordate Diversity Worksheet. Due at the end of lab.

Name \_\_\_\_\_ GSI & Sect # \_\_\_\_\_ Station # \_\_\_\_\_

This worksheet forms part of the basis for the questions that will appear on the lab exam. In addition you should know information provided by your GSI. Enjoy, but do not torment, the live animals. Think about the big picture and focus on how these animals survive and reproduce in their natural environments. You do not need to proceed in numerical order through the stations, although they are organized so that you can do so. Mammals and bird questions are towards the end of the worksheet, and are located in 2097 VSLB. **You should look at the marine tank in both rooms (2095 & 2097 VLSB) as it will form the basis of station 30 on your lab exam.**

**Urochordates (tunicate) -- make a drawing (on the left).**

**Cephalochordates (Lancelet) -- make a drawing (on the right).**

**FISHES (jawless fish: Myxini and Petromyzontida Jawed fishes: Chondrichthyes, Actinopterygii, Sarcopterygii [fishes are the non-tetrapod forms of Sarcopterygii])** The study of fishes is known as ichthyology.

### STATION ONE: FISH DIVERSITY

1A. Which of the extant groups of fish possess jaws?

1B. What are two major difference between the sharks (Chondrichthyes) and the other jawed fishes (Actinopterygii and the non-tetrapod forms of Sarcopterygii)?

Skeletal difference =

Modification of the gastrointestinal tract =

### STATION TWO: SKELETAL SYSTEM

2. How do the vertebrae of terrestrial tetrapods differ from the vertebrae of fish? Look carefully at the interaction of one vertebra with the adjacent vertebra!

STATION THREE: FISH JAWS

3. How do the teeth of Chondrichthyes (SHARKS) differ from those of a ray-finned fish?

Name a vertebrate group that lacks a jaw.

STATION FOUR: LOCOMOTION

4A. What is a homocercal tail?

4B. Give one characteristic of the shark that provides buoyancy.

4C. How is the swim bladder of a teleost an advantage over the system of buoyancy in a shark?

STATION FIVE: SOME FISH ODDITIES

5. Which of the fish stories pictured seems the oddest to you?

STATION SIX: PHOTOGRAPHIC IMAGES ON THE COMPUTER.

**AMPHIBIA AND REPTILIA (The study of amphibians and reptiles (usually excluding the birds is known as herpetology.)**

STATION ONE: AMPHIBIAN SKIN

1A. Why is the skin of amphibians (and probably most of the earliest tetrapods) moist?

1B. Why do you think the capacity to produce toxins has evolved in salamanders and frogs?

STATION TWO: AMPHIBIAN SKELETON

2A. Look over the bullfrog skeleton. Note the **ilium**. Would you think that proportionately longer or proportionately shorter ilia would be associated with frogs that hop and jump rather than walk?

2B. Note the mudpuppy skeleton (a type of salamander). In what ways do its limbs differ from the frog legs?

STATION THREE: REPTILIAN DIVERSITY

3A. Read the selections on lizards and snakes. List two major differences between the two suborders (lizards and snakes):

i.

ii.

3B. Read the article on the composition of a turtle “shell”. What is the shell made of?

3C. Read the article on the composition of the armor of a crocodile. What is the armor of a crocodile derived from?

STATION FOUR: SNAKES (Group SERPENTES)

4A. The ribs of snakes are not connected ventrally. What advantage might this give to snakes?

4B. What are two functions of snake venom?

i.

ii.

STATION FIVE: BODY MORPHOLOGY AND HABITAT

5A. Can you guess the habitat of the snakes shown here?

i. Green tree python (photograph only)

ii. Emerald tree boa (photograph only)

iii. Rosy boa

iv. Ball python

5B. Which of these snakes are most closely related? Does this agree with the obvious convergence in form and coloration of several of the snakes?

STATION SIX: RELATIONSHIPS AMONG REPTILES

6A. What features of Archaeopteryx are surprisingly like those of living birds? (A plaster cast of Archaeopteryx can be found in the display case south of the Bioscience Library.)

What features are typical ancestral reptilian features?

STATION SEVEN: PHOTOGRAPHIC IMAGES ON THE COMPUTER.

**AVES (within the group Reptilia. The study of birds is known as ornithology.)**

STATION 1: THERMOREGULATION

1. Why do birds FLUFF their feathers on very cool mornings?

STATION TWO: ADAPTATIONS FOR FLIGHT

2. What does the pigeon skeleton tell you about the bird's adaptations for flight? (WRITE SOMETHING MORE THAN "IT HAS WINGS") -- Note that reduced teeth, jaws, and skull are probably not flight adaptations, but more properly are considered feeding specializations! This is a false story that has been perpetuated in biology texts for decades.

i.

ii.

iii.

STATION THREE: WINGS AND FLIGHT

3. Don't memorize wing types. Relate the shape to the mode of flight.

Compare and contrast the wing structure of birds and bats.

How do the broad short wings of hawks relate to the habitat of hawks? (in relation to flying)

STATION FOUR: FEET

4. How does the coot foot work?

STATION FIVE: BILLS

5. Which birds shown in the display use their bills as sieves? Which use them as probes? Which use them as nut-crackers?

STATION SIX: NESTS

6. Which partner (male or female) builds the bird nest?

STATION SEVEN: PHOTOGRAPHIC IMAGES ON THE COMPUTER.

**MAMMALIA (The study of mammals is known as mammalogy).**

STATION ONE: WHAT IS A MAMMAL?

1A. Name four anatomical-physiological features that characterize mammals:

i

ii

iii

iv

1B. Are all female mammals able to lactate?

1C. What are some functions of mammalian hair?

i.

ii.

iii.

1D. List one function of scent in mammals.

STATION TWO: AQUATIC ADAPTATIONS IN MAMMALS

2. The blue whale, at about 150 tons adult mass, is the largest animal ever to have lived on the planet. The blue whale is a filter feeder which uses baleen to “filter” out food. What is baleen made of (hint: it’s the same material as your hair and fingernails...)?

STATION THREE: PRIMATES

3. List a few features that are common to the primates.

STATION FOUR: FEEDING IN MAMMALS

4. Look at the teeth in the skulls of a carnivore and of a herbivore. What do you notice about the differences between the number, types and locations of teeth?

STATION FIVE: CHIROPTERA (BATS)

5A. Bats have diverged into numerous feeding types. There are fruit-eating bats, nectar-feeding bats, insect-eaters, frog-eaters, blood-suckers, fish-eaters. Which bats are most likely to have a highly developed aptitude for echolocation? Which might be expected to have a highly developed sense of smell?

5B. How does an echolocating bat distinguish a fluttering leaf from a flying insect?

5C. Contrary to popular opinion, bats are very beneficial. Name three ways that bats benefit the environment, and thus, humans. (Think about what you see in the pictures).

i.

ii

iii

STATION SIX: PHOTOGRAPHIC IMAGES ON THE COMPUTER.

Please look at the images and see if you can find members of each group given below. No, you don't need to memorize these groups or be able to recognize them. Just appreciate the diversity.

MARSUPIALS {1}, PRIMATES {6-9}, EDENTATES (armadillos & anteaters, [not shown]) {10-11}

RODENTS {12-18}, LAGOMORPHS (rabbits) {19-20}, CARNIVORES (cats, dogs, raccoons, bears) {21-33}

CETACEANS (whales) {34}, ELEPHANTS {35-36}, HYRAXES {37}

PERISSODACTYLS (zebras, horses & rhinos [not shown]) {38}

ARTIODACTYLS (cows & antelopes) {39-48}