

Slide 1. 1A. Slide of a shark. To what **class** does this animal belong? (1 pt)

- a. Myxini
- b. Osteichthyes
- c. Cephalaspidomorphi
- d. Vertebrata
- e. Chondrichthyes**

1B. How does this animal differ from the Osteichthyes? (2 pts)

- a. this animal possesses a jaw
- b. this animal feeds exclusively on other animals
- c. this animal lives among the rocks in the intertidal zone
- d. this animal has a cartilaginous skeleton**
- e. this animal is a suspension feeder

Slide 2. 2A. Slide labeled as follows: A—sea star; B—sea anemone. What is absent in these two animals, obviously indicating that they are not cephalized? (2 pts)

- a. radial symmetry
- b. a head**
- c. a mouth
- d. an anus
- e. a nervous system

2B. Animal B is a sessile organism while animal A is not. Within this context what does animal A do that animal B does not? (2 pts)

- a. have a higher surface area to volume ratio
- b. it digs better in the sand
- c. live in the intertidal zone
- d. feed on other organisms
- e. move around**

Slide 3. 3. slide of a prairie dog. To what phylum does this animal belong? (1 pt)

Chordata

No question 3B.

4. What is a monoecious organism? (1 pt)

An organism where both sexes are present in a single individual

Quiz continued on other side.

5A. How can you tell if a skull belongs to a carnivore rather than an herbivore? (1 pt)

Some possible answers: There would be nothing but sharp teeth in the carnivore skull. The herbivore skull possesses the diastema and has grinding teeth.

5B. How might a suspension feeder be a strict carnivore? (2 pts)

They would reject any particle of food that they did not want to eat (for example algae that may have been inadvertently captured).

6. Why would a respiratory system have a high surface area to volume ration? (2 pts)
To maximize the amount of space oxygen can enter into the animal

7. Use the following taxa to answer question 6: lizard, turtle, frog, bird. (6 pts total)

Draw a phylogenetic reconstruction (a cladogram) indicating the following:

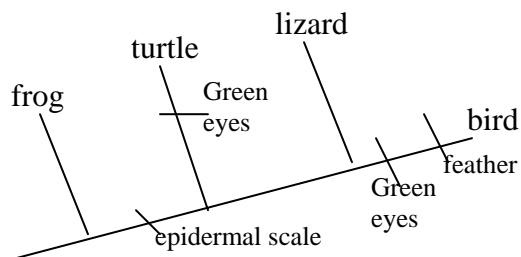
A) Using the frog as the outgroup, draw a tree placing all of these taxa on a tree and placing the outgroup in the correct position (you decide how the other taxa occur on the tree). (1 pt)

B) Place the trait “epidermal scale” on the same tree showing that it is a homologous trait among the reptiles. (1 pt)

C) Place the trait “feathers” showing that it is unique to the birds. (1 pt)

D) Place the trait “green eyes” on the tree showing that it evolved independently in at least two taxa. (1 pt)

Example



E) What is the sister group to the bird on the tree you created? (1 pt)

F) Briefly explain the purpose of the outgroup. (1 pt)

Quiz 2 Fall 2006

Name_____key_____

Lab Section _____

Slide 1. 1A. Slide of a shark. To what **subphylum** does this animal belong?

- a. Chordata
- b. Osteichthyes
- c. Cephalaspidomorphi
- d. Vertebrata**
- e. Chondrichthyes

1B. The teeth in the above animal are homologous to their scales. How do we know this?

- a. teeth and scales are functionally similar
- b. teeth and scales are derived from the same tissue layer**
- c. teeth and scales are found in their most recent common ancestor
- d. teeth and scales are easily visible in the adult animal
- e. that's what they tell us

Slide 2. 2. Slide labeled as follows: A—sea star; B—sea anemone. Animal A and B are similar in many ways (e.g., both have radial symmetry). However, you will learn that animal A is quite different in that it has a complete gut whereas animal B has an incomplete gut. What structure would then be present in animal A but absent in animal B?

- a. an oral/aboral axis of symmetry
- b. a distinct head
- c. a centralized nervous system
- d. an anus**
- e. suspension feeding structures

No Question 2B.

Slide 3. 3A. slide of a prairie dog. To what **class** does this animal belong?

Mammalia

3B. This group of animals is a sister lineage to the lizards, snakes, and birds. What distinguishes this animal from the Reptilia?

- a. this animal possesses a skeleton made of bone (calcium)
- b. this animal possesses two occipital condyles**
- c. this animal is a tetrapod
- d. this animal possesses dermally derived scales
- e. this animal is not cephalized

Quiz continued on other side.

4A. What is an omnivore?

an organism that eats both plants and animal

4B. In a sketch, draw an aquatic organism that would feed on suspended particles of food.

Sketch of something with tentacles or a catch net sticking up in the water

5. What might be an advantage for an organism to be monoecious?

Variations on: Don't have to find a mate of the opposite sex in order to reproduce.

6. Use the following taxa to answer question 6: kangaroo, lizard, platypus, bat. (6 pts total)

Draw a phylogenetic reconstruction (a cladogram) indicating the following:

A) Using the lizard as the outgroup, draw a tree placing all of these taxa on a tree and placing the outgroup in the correct position (you decide how the other taxa occur on the tree). (1 pt)

B) Place the trait "hair" on the same tree showing that it is a homologous trait among the mammals. (1 pt)

C) Place the trait "wings" showing that it is unique to the bat. (1 pt)

D) Place the trait "brown fur" on the tree showing that it evolved independently in at least two taxa. (1 pt)

E) What is the sister group to the bat on the tree you created? (1 pt)

F) Briefly explain the purpose of the outgroup. (1 pt)

7. What might be a disadvantage to having a body shape with a high surface area to volume ratio? **Lose water quickly, lose heat easily**

Quiz 2 Fall 2006

Name _____ **key** _____

Lab Section _____

1A. Slide of a shark. To what **phylum** does this animal belong?

- a. **Chordata**
- b. Chondrichthyes
- c. Cephalaspidomorphi
- d. Vertebrata
- e. Osteichthyes

1B. The fusiform body apparent in this animal is also found in the some mammals, such as the whales. When considering this animal and the whales, this trait is in fact a homoplasy. How might you recognize that it is a homoplasy?

- a. **they do not share a recent ancestor with this trait**
- b. the body forms do not share the same function
- c. they live in the same environment
- d. the body forms do no provide an advantage
- e. this trait is limited to only the fishes

2A. Slide labeled as follows: A—sea star; B—sea anemone Animal B has a higher surface area than that found in animal A. What would be a disadvantage to having a higher surface area in an intertidal area?

- a. **greater probability of desiccating**
- b. greater ability to retain heat
- c. less likelihood of oxygen uptake
- d. lower probability of being able to feed
- e. increased likelihood of becoming dislodged

2B. One of these animals is a suspension feeder. Which one would you suspect to be the suspension feeder and why?

B—has tentacles that face upward in the water column

3A. slide of a prairie dog. To what **subphylum** does this animal belong?

Vertebrata

3B. This animal is an herbivore. What about this animal's jaw morphology would tell you that it is an herbivore?

- a. the front teeth do not tear food very well
- b. **a diastema is present**
- c. sharp grinding molars are present
- d. caninines are present
- e. molars are present

Quiz continued on other side.

4. What is a dioecious organism?

An organism where male and female reproductive structures are found in different individuals.

5. Intuitively one might predict a suspension feeder, such as a barnacle or sea anemone, would be an omnivore. Why might one make this prediction?

Omnivorous suspension feeders would just grab any particle of food floating or swimming by.

6. In order for the Reptilia to be considered monophyletic, they must include the birds. List one piece of evidence indicating that birds are truly a subgroup of the reptiles.

Possibilities: one occipital condyle, epidermal scales, amniotic egg (probably won't list this), fossils with bird and reptile features, claws on forelimbs of immature hoatzin.

7. Use the following taxa to answer question 6: trout, lamprey, bass, blue gill. (6 pts total)

Draw a phylogenetic reconstruction (a cladogram) indicating the following:

A) Using the lamprey as the outgroup, draw a tree placing all of these taxa on the tree and placing the outgroup in the correct position (you decide how the other taxa occur on the tree). (1 pt)

B) Place the trait "jaw" on the same tree showing that it is a homologous trait among the bony fishes. (1 pt)

C) Place the trait "posterior fin" on the tree showing that it is unique to the trout. (1 pt)

D) Place the trait "spotted gill cover" on the tree showing that it evolved independently in at least two taxa. (1 pt)

E) What is the sister group to the bass on the tree you created? (1 pt)

F) Briefly explain the purpose of the outgroup. (1 pt)