

Herpetology – RAHS Invitational Science Olympiad Tournament

December 2nd, 2017

Team number: _____ Team Name: _____

Participant Names: _____

Score: _____ Rank: _____

Instructions: Answer any questions that follow for 15 organisms in Class Reptilia. For each organism, there will be a set of questions to answer below. Each organism will be on the screen for 2.5 minutes. Questions and identifications are each worth one point, unless expressed otherwise by placing points in parentheses following the question.

Organism #1: Common name: _____

Genus: _____

The anal plate on this organism is _____

The sex of this organism can be determined by conducting a probe of the _____

Because species of snakes within this genus can be so different, most herpetologists believed that as soon as they were extensively studied, their scientific names would change. Indeed, this has become the case. Specifically, what techniques/data is currently being collected to better classify and relate these species of organisms?

Organism #2: Common name: _____

Family: _____

How many large (carapace length up to 1.4 m) species of these organisms are found throughout the world? _____

Most of these species exhibit a pelagic migratory stage until the age of about 12. What type of migratory pattern is 'pelagic'? _____

At what general age does this organism reach reproductive maturity? _____

What is the maximum number of egg clutches a mature female can produce in one season? _____

Organism #3: Common name: _____

Family: _____

The majority of this family resides in trees, while the pictured organism is a ground dweller. What would be an anatomical reason for this organism not dwelling in trees?

List the two reasons this ground-dwelling organism is still classified in the same family with tree frogs. (2 points)

1. _____

2. _____

Some members of this family can aestivate. What does that tell you about the ecology of where some of these organisms reside?

Organism #4: Family: _____

What is the native region of this specimen? _____

These organisms are paedamorphic. What does this mean for the anatomic of this specimen?

In terms of conservation, this specimen is not endangered, but the immediate danger to these creatures is

This family of organisms consists of only 3 species. What anatomical feature can help you distinguish one species from another? _____

Organism #5: Common name: _____

Family and Genus: _____

The tail on this specimen is made of what material? _____

During what process in the life of this specimen does it add an extra button to its tail?

What type of toxin is found within the venom of this specimen? _____

Medical researchers have harnessed the unique combination of targeting and toxicity in this toxin to create a cancer treatment to attack and kill tumor cells. This toxin only works on particular cells that are found in what 2 different locations in the human body? (2 points)

1. _____

2. _____

Slide #6: Which organism on this slide is a frog? (1 or 2): _____

The other organism shown is a toad. Give 5 characteristics (anatomical or behavioral), which helped you to determine which organism is which. (5 points)

1. _____
2. _____
3. _____
4. _____
5. _____

The eggs labeled "A" would be laid by which organism? (1 or 2): _____

The eggs labeled "B" would be laid by which organism? (1 or 2): _____

Tadpoles play an important role in an ecosystem. Besides acting as a food source, what would be another role tadpoles play in an ecosystem?

Slide #7: For each skull pictured, assign each skull structure to its corresponding Family. (3 points)

Skull A. _____

Skull B. _____

Skull C. _____

The family associated with Skull "A" has an almost worldwide distribution. Circle the continent(s) below where these snakes cannot be found.

Asia Australia Africa Europe North America South America

The family associated with Skull "A" is closely related to sea snakes (Hydrophiinae) to the point that they are not always considered to be two separate families. What anatomical feature changes between the family of Skull "A" and Hydrophiinae and where is this feature located on a Hydrophiinae skull?

Explain how the common name of Pit viper was developed. (2 points)

Organism #8: Common name: _____

Family: _____

Genus: _____

In the photograph of Organism #8, is this a male or female and explain how you know.

Explain whether a male or female of Organism #8 initiates the courtship and explain what he/she does to show the courtship has begun.

The green female variety of Organism #8 has adapted a unique ability relating to her reproductive tract that contributes to the survival of this species. What is this unique ability?

Slide #9: If these images are grouped by family, which one does not belong here? _____

To what family does the oddball belong? _____

Give the common name of the organisms pictured that can be readily found in both freshwater and saltwater habitats?

Members of this family exhibit TSD. What does this acronym represent?

As climates continue to change, specifically regions where alligators reside where average temperatures are steadily rising, alligator populations will likely decline. This is because most of the developing eggs incubated at 33 degrees Celsius will be _____ in gender.

Organism #10: Order: _____

Family: _____

What is the defensive strategy of Organism #10? _____

What is the nickname of Organism #10? _____

A _____ is a bony external plate or scale overlaid with horn, as on the shell of a turtle, the skin of crocodylians, and the feet of birds.

For a cottonmouth snake (found in the same habitats as Organism #10), chemical cues are critical for all aspects of feeding. While Organism #10 is still prey for a cottonmouth snake, Organism #10's defense mechanism lengthens the subjugation phase giving Organism #10 more time to escape the snake's jaws. What specialized organ does a cottonmouth use to receive these chemical cues? _____

Organism #11: Family: _____

Genus: _____

During the breeding season, when levels of the hormone _____ are high, the heads of males become red in color and muscles in the head increase slightly in size.

Organism #11's tail is a very bright blue color. Why is this bright colored tail actually an antipredator mechanism?

Many of the species within this family of organisms like Organism #11 are viviparous. What does viviparous mean for animals?

Slide #12: Genus: _____

Which picture shows a Southern variety (A or B)? _____

How did this genus acquire its common name? _____

What anatomical feature do these frogs have that most frogs do not? _____

How are the mouthparts of a tadpole different from those of an adult?

Organism #13: Order: _____

Family: _____

All members of this family have how many chambers to their heart? _____

Through genetic analysis, this family of organisms is not closely related to other members of the same order. What distinguishing anatomical feature would help draw this conclusion without genetic analysis?

This family of organisms is neotenic, although the larval gills are small and functionless at first, and only adults have fully developed gills. What does this likely mean about the ancestors of this family of organisms?

Organism #14: Genus: _____

The head and neck length of Organism #14 are relatively equal to the length of its _____

Which gender of Organism #14 is larger as an adult? _____

How do males of Organism #14 court the females?

How does Organism #14 react to escape dry conditions? _____

Organism #14 spends much of their time basking in the sun. Why do they conduct this behavior frequently?

Organism #15: What is the specific genus of each organism? (4 points)

A: _____

B: _____

C: _____

D: _____

For the organism shown in picture "C", what is its primary habitat like?

Also for organism "C", besides the anatomical adaptation of the foot structures, what adaptation does this organism have to deter/hide from predators? _____

Slide #16 – Tiebreaker At least _____ genes in the African clawed frog genome are very similar to genes in humans that are associated with specific diseases, such as cancer, asthma, and heart disease.

These frogs are unusually sensitive to human chorionic gonadotropin (HCG). In the 1940s-1950s, how did the medical field use these frogs?
