

## Practice B/C Herpetology Answer Key

### Station 1

1. Painted turtle - *Chrysemys* (1 pt.)
2. “Gold turtle” (*chryos* - gold; *emys* - turtle) (1 pt.)
3. Yes.(1 pt.) 2 of the following must be given: males are smaller, with larger claws, thicker tails, and a further back vent; females have higher and rounder shells. (2 pts.)
4. Yes. The painted turtle (or 1 of its subspecies) is the state reptile of Colorado, Illinois, Vermont, and Michigan. (1 pt.)
5. Answer must mention the salmonella risk (1 pt.), the tendency of people to take them from the wild (1 pt.), and the risk of people releasing formerly captive turtles to the wild where they likely cannot survive and will spread disease. (1 pt.) These former pets may even become invasive

### Station 2

1. Coral snakes - Elapidae (1 pt.)
2. Proteroglyphous means that their fangs are short and do not move or fold up against the roof of their mouth (1 pt.) The other main type of fangs in venomous snakes are solenoglyphous fangs. (1 pt.)
3. False. There is little to no damage at the bite site, unlike vipers. (1 pt.)
4. Must have 5 of these (5 pts.):
  - Headache
  - Altered mental state
  - Dizziness
  - Nausea
  - Hypotension
  - Paresthesia (tingling, numbness, etc.)
  - Cranial nerve damage
  - Respiratory paralysis
  - Paralysis of striated muscles
5. The inland taipan or *Oxyuranus microlepidotus* has the most potent venom in the family. (1 pt.)

### Station 3

1. Cricket frog - *Acris* (1 pt.)
2. Their calls sound like pebbles clicking together or “glick-glick-glick.” (1 pt.)
3. They display polymorphism because they appear to be undergoing apostatic selection; apostatic selection means that organisms that differ from other members of their species are favored because predators are more likely to ignore them. Cricket frogs with different

patterns from the rest of their species are less likely to be recognized and eaten; this results in many different patterns/morphs. (2 pts.)

4. Anything around 7,000 will be accepted (1 pt.) but AmphibiaWeb currently lists the number as 6,968. A bonus point will be given for having that answer.
5. Chytrid fungus or *Batrachochytrium dendrobatidis*. (1 pt.)

#### Station 4

1. Rat snakes - *Elaphe* (1 pt.)
2. Any 3 of the following (3 pts.):
  - Rodents
  - Bats
  - Birds
  - Bird eggs
  - Frogs
  - Lizards
3. Use the methods of both foraging and ambush hunting methods to hunt. (1 pt.)  
Constriction is used to kill. (1 pt.)
4. When threatened by predators some remain motionless (1 pt.) Others assume a kinked posture and vibrate their tails like rattlesnakes. (1 pt.)
5. Any 5 of the following (5 pts.):
  - No vestiges of the hind limbs
  - A functional left lung
  - Coronoid bones in the lower jaw
  - No teeth on the premaxilla
  - A Duvernoy's gland
  - Solid, conical teeth are present on both jaws
  - Wide ventral scales
  - Usually only 9 scales on the top of the head
  - Usually non-venomous/harmless to humans

#### Station 5

1. Diamondback terrapin - *Malaclemys* (1 pt.)
2. Any 2 of the following (2 pts.):
  - Capable of osmoregulation
  - Lachrymal salt glands
  - Skin that is mostly resistant to salt
  - Can rehydrate very quickly
  - The ability to tell the difference between water of different salinities
  - Gathering rainwater on the margins of their shells and from their limb sockets

- Drinking the freshwater that gathers on top of salt water during rain
  - The turtles also catch rain in their mouths as it falls from the sky
3. The turtles do usually lay multiple clutches (1 pt.) They have 4-23 eggs in a clutch. (1 pt.)
  4. Eat snails, bivalves, other mollusks, crustaceans, fish, insects, worms, and carrion. (1 pt.)
  5. False. Females are much larger than males. (1 pt.)

#### Station 6

1. Earless lizards - *Cophosaurus* and *Holbrookia* (1 pt.)
2. Head-bobbing and “push-ups” (1 pt.) These behaviors are used to mark territory. (1 pt.)
3. Female. (1 pt.) You can tell because gravid females often have orange throat and body patterns. This specimen also lacks the black stripes and blue and yellow splotches of males. (1 pt.) Another common pattern for gravid females of this group is having a pink throat and flanks.
4. They live in rocky, mountainous deserts. (1 pt.)
5. Earless lizards only live for 2 years. (1 pt.)

#### Station 7

1. Mudpuppies and water dogs - Proteidae (1 pt.)
2. Italy, Slovenia, and eastern North America. (1 pt.)
3. The somewhat incorrect idea that they make barking vocalizations. (1 pt.)
4. 6. (1 pt.) The one pictured above is the olm, a cave-dwelling species.
5. Paedomorphy: the retention of larval or ancestrally larval traits in an adult. (1 pt.)

#### Station 8

1. King and milk snakes - *Lampropeltis* (1 pt.)
2. Males begin competing by raising their heads/necks (1 pt.), entwining them (1 pt.), and trying to push each other to the ground. (1 pt.) The loser retreats and lays coiled in a prone position (1 pt.); the winner mates with the female. (1 pt.)
3. Most rat snakes are shy, secretive, wary, etc. (1 pt.); they become aggressive when threatened (1 pt.) Some other species, particularly corn snakes, are very gentle and docile (1 pt.)
4. Yes. (1 pt.)
5. March to May, after brumation. (1 pt.)

#### Station 9

1. True toads - Bufonidae (1 pt.)
2. A rudimentary ovary (1 pt.) found at the anterior end of the larval testes. It becomes functional without the production of testosterone. (1 pt.)

3. It usually only causes skin irritation. (1 pt.) Yes. (1 pt.) It is used for folk medicine and as a hallucinogenic drug. (2 pts.)
4. They have modified joints in their legs that prevent leaping. (1 pt.)
5. Amplexus: the mating embrace of frogs in which the male typically takes a position on the back of the female and tightly grasps onto the female with his front legs until eggs are laid and fertilized. (1 pt.)

#### Station 10

1. Brown snakes and redbelly snakes - *Storeria* (1 pt.)
2. They emit a musk (1 pt.), release their cloacal contents (1 pt.), flatten their bodies to make themselves appear larger (1 pt.), and assume an aggressive posture (1 pt.).  
Red-bellied snakes have a unique lip-curling behavior. (1 pt.)
3. Can have 3-20 offspring at a time. (1 pt.)
4. Any 2 of the following (2 pts.):
  - No loreal scale
  - A postnasal which touches the preocular
  - Divided anal scale
  - Heavily keeled scales
5. True (1 pt.)

#### Station 11

1. Cooters and redbellies- *Pseudemys* (1 pt.)
2. Adults have flatter, rounder shells with less prominent patterns due to the wear of rivers over time. (1 pt.)
3. Eat mainly aquatic plants (green algae, pond weeds, etc.). (1 pt.)
4. The Bambara and Malinké word *kuta*, which means turtle. (1 pt.)
5. Up to 17.3 in (44 cm). (1 pt.)

#### Station 12

1. Gila monster - Helodermatidae (1 pt.)
2. The last confirmed fatality was in 1939. (1 pt.)
3. They date back to the Cretaceous period (144 to 65 million years ago). (1 pt.)
4. Venom glands are in the lower jaw. (1 pt.)
5. Either 1 of the following:
  - Exenatide (Byetta) (1 pt.) treats type 2 diabetes. (1 pt.)
  - Gilatide (1 pt.) could be used to improve memory/treat numerous conditions including ADHD, Alzheimer's disease, and schizophrenia (1 pt.)

#### Station 13

1. Sea turtles - Cheloniidae (1 pt.)
2. They lay eggs in 3-4 year cycles. (1 pt.)
3. Higher temperatures: above 83-5°F (28-29°C) produce mainly females (1 pt.) and cooler temperatures: below 83-5°F (28-29°C) produce mainly males. (1 pt.)
4. Arribadas: synchronized, large-scale nesting of some species of sea turtle. (1 pt.)
5. A herpesvirus is the suspected causative agent. (1 pt.)

#### Station 14

1. Pygmy rattlesnakes and massasaugas - *Sistrurus* (1 pt.)
2. They use caudal luring, a form of aggressive mimicry in which the tail is used to imitate a worm or insect larvae, in order to attract prey that feed on worms and insect larvae. (1 pt.)
3. The biggest physical feature that distinguishes them from *Crotalus*, that is visible in the photo, is the fact that they have only 9 head scales. (1 pt.)
4. Male massasaugas insert gelatinous plugs into females' cloacas after mating. (1 pt.)
5. False. They have less potent venom than *Crotalus*. (1 pt.)

#### Station 15

1. Mole salamanders - Ambystomatidae (1 pt.)
2. Ambystomatidae is defined by the lack of lacrimal bones (1 pt.); fused exoccipitals, prootics, and opisthotics (1 pt.); vomerine teeth that are in a transverse orientation(1 pt.); and well-developed lungs. (1 pt.)
3. The larvae appear similarly to adults (1 pt.) except for the fact that they have external gills and caudal fins. (1 pt.)
4. Many hybrid species are unisexual and parthenogenetic. (1 pt.)
5. The axoltol or *Ambystoma mexicanum* (1 pt.) is frequently used in scientific studies. It is mainly focused on for its neotenic traits and its ability to regenerate lost limbs. (1 pt.)

#### Station 16

1. Crocodiles - Crocodylidae (1 pt.)
2. They have four-chambered, not three-chambered hearts. (1 pt.)
3. Many species in this group are threatened by habitat loss (1 pt.) and poaching for their skins. (1 pt.)
4. Crocodiles communicate vocally (grunts, growls, etc.) (1 pt.) and through chemical signals. (1 pt.)
5. Gastroliths: small stones swallowed by birds, reptiles, or fish, to aid digestion in the gizzard. (1 pt.)

#### Station 17

1. Sculptured turtles - *Glyptemys* (1 pt.)

2. The group's defining feature are the concentric growth rings in their scutes. (1 pt.)
3. Eggs are laid in sunny areas (1 pt.) by water (1 pt.) in either boggy or sandy soil. (1 pt.)
4. Many eggs never hatch due to predation by small to medium-sized mammals. (1 pt.)
5. The wood turtle (*Glyptemys insculpta*) (1 pt.) was found to get out of mazes with the same skill/intelligence as a rat. (1 pt.)

#### Station 18

1. Slender salamanders - *Batrachoseps* (1 pt.)
2. Their tongues are attached anteriorly to their elongate genioglossus muscle. (1 pt.)
3. Nasolabial grooves are used to move scent particles to their vomeronasal organ. (1 pt.)
4. *Batrachoseps* means frog-lizard. (1 pt.)
5. Slender salamanders can be found at the Pacific Coast of Oregon, California, and Baja California. (1 pt.)

#### Station 19

1. Western pond turtle - *Actinemys* (1 pt.)
2. The turtle is basking (1 pt.) and this is very common among these turtles. (1 pt.)
3. They live for 40-70 years. (1 pt.)
4. Fights are usually over basking territory. (1 pt.)
5. An ideal Western pond turtle nest faces south (1 pt.), is near water (1 pt.), is made of dry soil and some vegetation (1 pt.), and covered in moist soil and vegetation. (1 pt.) Must be at least 10 cm deep. (1 pt.)

#### Station 20

1. Wall lizards - Lacertidae (1 pt.)
2. Parthenogenesis (reproduction without a male). (1 pt.)
3. False. They are only found in the Old World. (1 pt.)
4. They spend most of their days basking. (1 pt.)
5. The viviparous lizard (1 pt.) or *Zootoca vivipara*. (1 pt.)

#### Station 21

- A. *Gyrinophilus* - spring salamanders
- B. *Charina* - rubber and rosy boa
- C. *Eumeces* - skinks
- D. *Trachemys* - sliders
- E. *Hydromantes* - web-toed salamanders
- F. *Heterodon* - hog-nosed snakes
- G. *Pseudacris* - chorus frogs
- H. *Emydoidea* - Blanding's turtle

I. Crotaphytidae - collared lizards

Station 22

1. The first amphibians evolved from lobe-finned fishes. (1 pt.)
2. This happened about 370 million years ago, during the Devonian Period. (1 pt.)
3. The first amphibians had more developed limb girdles (1 pt.) and more distinct necks than their ancestors (1 pt.); they also had limbs with bony digits. (1 pt.)
4. Anura/Salientia (1 pt.) - frogs (1 pt.)  
Caudata/Urodela (1 pt.) - salamanders (1 pt.)  
Gymnophiona/Apoda (1 pt.) - caecilians (1 pt.)
5. The temnospondyl hypothesis. (1 pt.)

Station 23

1. *Hylonomus* or *Hylonomus lyelli*. Either would be accepted. (1 pt.)
2. This lizard-like reptile lived about 312 million years ago, during the Late Carboniferous or Pennsylvanian Period. (1 pt.)
3. The Mesozoic Era. (1 pt.) It lasted from about 251 to 65.5 million years ago. Due to conflicting information answers around 250 or 65 million years will be accepted. (1 pt.)
4. Yes. Technically, birds are dinosaurs. (1 pt.)
5. Anapsid means having a skull with no temporal fenestra (1 pt.); diapsid means having a skull with two temporal fenestra. (1 pt.)

Station 24

1. Answers may vary. They must list the reason herpetiles were first grouped together as Carl Linnaeus's (and other early taxonomists/biologists) distaste and disinterest for them. He did not distinguish between the two groups and called them "foul and loathsome." (1 pt.) The main shared characteristic between amphibians and reptiles (and the one that has kept them together) is their ectothermy. This affects all other aspects of their lives. (1 pt.) Every answer must give their opinion (1 pt.) and support it with evidence. (2 pts.)

Station 25

1. *Acris* - cricket frogs (1 pt.)