



2019 HERPETOLOGY (B/C)



Information shared by:

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WHAT IS HERPETOLOGY (B&C)*

■ Content:

- Reptiles and Amphibians

- Taxonomic Scheme of the **2019 Official Science Olympiad NATIONAL HERPETOLOGY List** modified by NC for NC

- Herpetology does not mean just snakes! **Don't forget salamanders, lizards and frogs...**

EVENT RULES – 2019

- **download all rules & list from**
www.soinc.org – National Science Olympiad
NCSO – NC Science Olympiad
- **The NC Herpetology list does not include all of the species from the National site.**

EVENT RULES – 2019

- ★ **Field guide / 1 Binder**
 - **2 inches or less**
 - **all sheets are to be attached in the 3 rings**
 - **information can be from any source and in any form**

- ★ **2019 Official National Herpetology List (does not have to be attached)**

EVENT PARAMETERS – 2019

★ Station Test

- ~20 questions
- ~4 questions each

★ ID live and photos of species

★ Students need to be comfortable with being in a room of the live species -- all are contained and safe!

EVENT PARAMETERS – 2019*



The competition may cover:

- **identification, anatomy & physiology, reproduction, habitat characteristics, ecology, diet, behavior – adaptations, ID calls, conservation, and biogeography**
- **Conservation status** (see IUCN red list)
- **Human impacts on herp species** (direct and indirect effects)
- **Significant nonnative herpetofauna & impact on native species**

SUGGESTED RESOURCES*

- *resource links on the National and State site*
- *Herp taxonomy, <http://www.cnah.org/>, <https://ssarherps.org/>*
- **Don't forget to review the old tests!!!**
- <http://collections.naturalsciences.org/searchHerp.aspx>
- <https://herpsofnc.org/>

- **NC Amphibian and Reptile* resources and/or state lists plus guides.**
- **Check the web for state resources.**
- **Many commercial field guides are available.**

2019 SO HERPETOLOGY*

- **Taxonomy is important!!!**
 - **25% of the test will be taxonomically based**
- **The taxonomic scheme is based upon a combination of traditional & current categories (designed to utilize familiar terms widely used in published resources available to students).**

Taxonomy

Official National List

- Order (Suborder)
 - Family
 - Genus
 - Common name

COMPARISON OF AMPHIBIANS AND REPTILES

Introduction

Amphibians mean living two lives (on land as well as on water). Amphibians usually have to stay near water sources to prevent drying out, and have smooth skin.

Reptiles are groups of animals that breathe air with lungs (no gills), have scales and claws on their bodies, and often lay eggs.

Examples of animals

Frogs, toads, and salamanders (including newts)

Snakes, lizards, crocodilians, and turtles

Method of Breathing

Gills, lungs, skin

Lungs

Body Metabolism

Ectothermic (cold-blooded)

Ectothermic (cold-blooded)

Metamorphosis

Yes. Breathes water through the skin and gills until it develops lungs.

No. Looks like a miniature adult when hatched .

Defense

Toxic skin secretions; may bite. No claws. If teeth are present, they are pedicellate teeth.

Nails and teeth (some snakes and a few lizards have fangs and venom). Reptiles have scales, which act as a kind of armor to physically protect the body.

COMPARISON OF AMPHIBIANS AND REPTILES -2

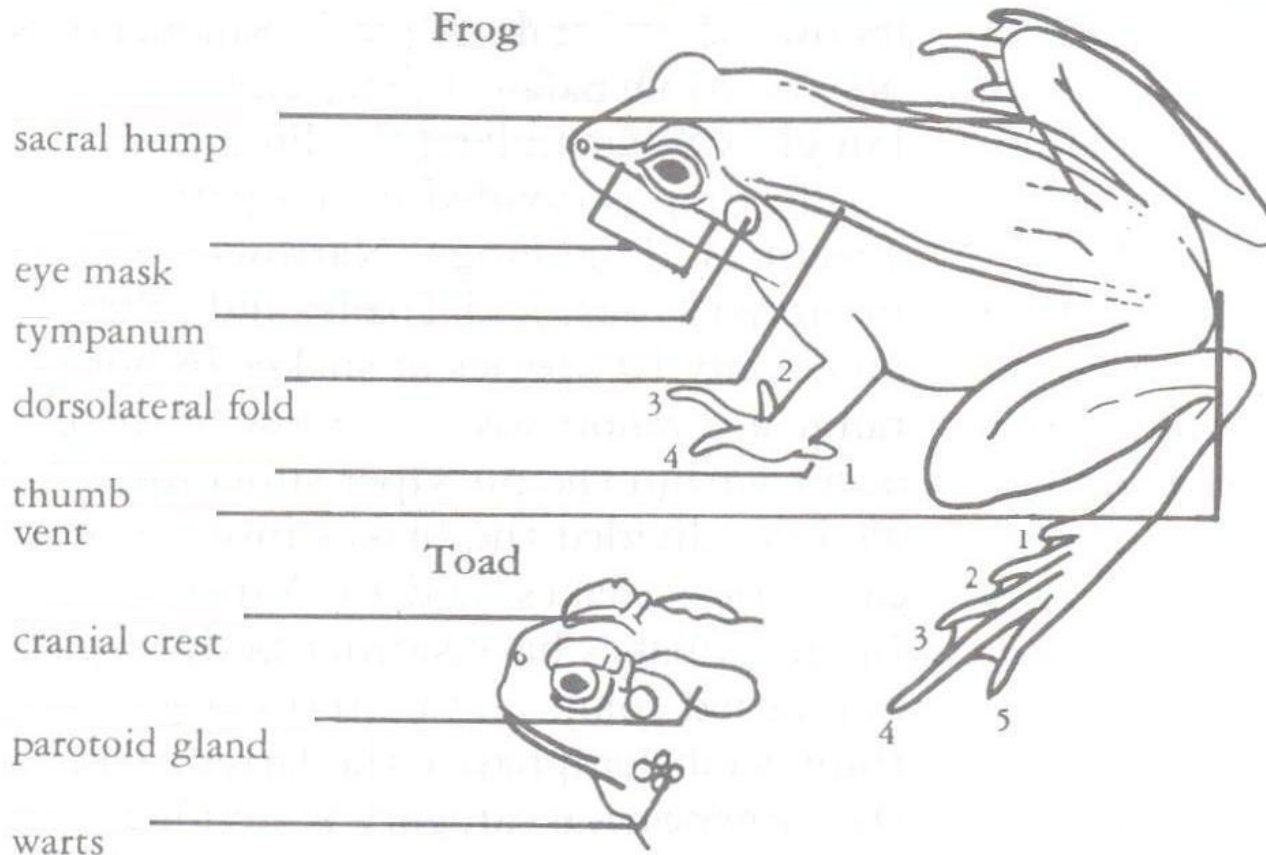
Heart structure	3-chambered	Most reptile hearts has three chambers, two atria and one, largely divided, ventricle. However crocodilians have four-chambered hearts with two atria and two ventricles (but the wall between the ventricles is incomplete).
Limbs	Short fore limbs and long hind limbs, often with five webbed digits.	Reptiles usually have four limbs, but some reptiles (snakes) have no limbs. Reptiles with limbs vary in their ability to move; some move very slowly and crawl, while others can run, jump, and even climb. One type of lizard can even run on water.
Skin Texture	Smooth, moist and glandular--sometimes rather sticky skin. Laden with mucous glands.	Dry and scaly. Scales are covered with a dead, outer layer of keratin. Living skin is found below the scales.
Eggs	Have soft, gelatinous covering surrounding their eggs --without a hard covering. Usually, found in water or moist places.	Amniotic egg. Have hard (calcareous or leathery) eggs laid on land or they keep eggs in their bodies until they hatch.
Reproduction	Usually external fertilization	Internal fertilization

COMPARISON CHART

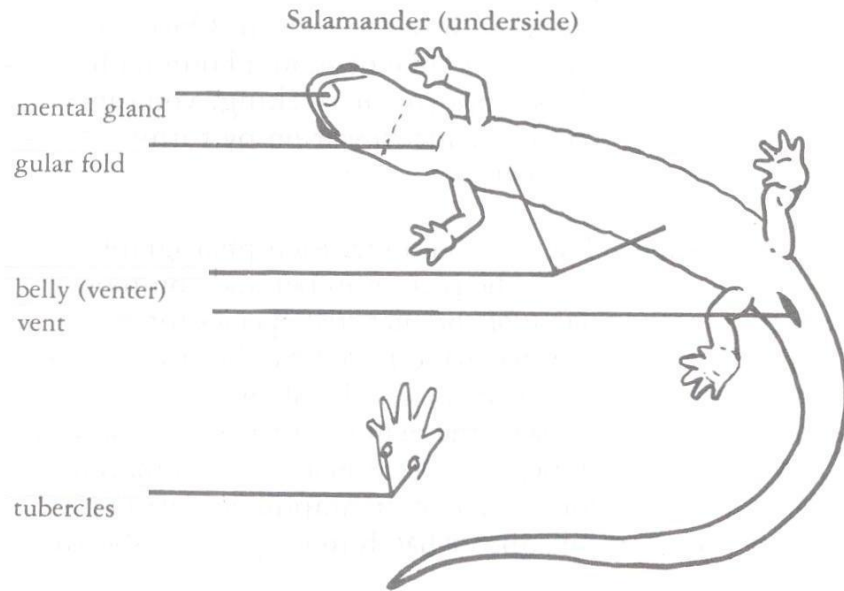
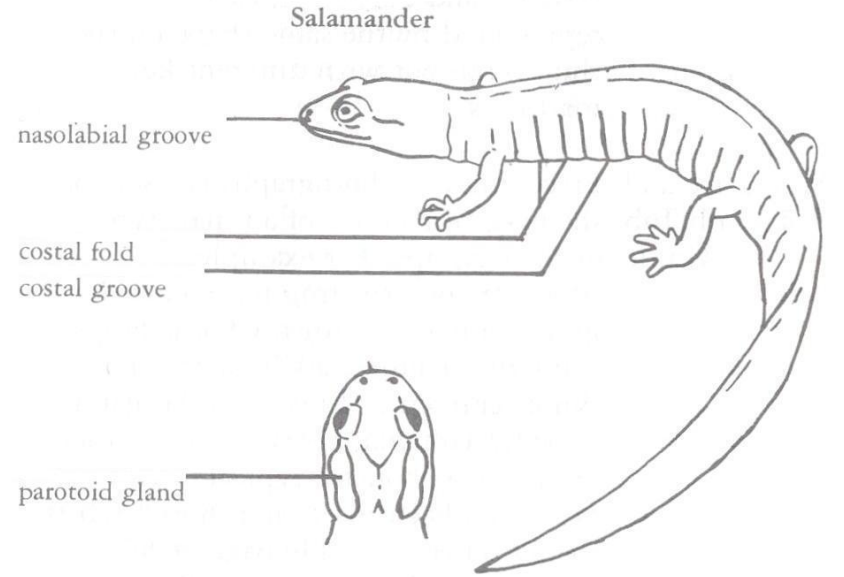
FROGS AND TOADS

	Frog	Toad
Hind legs	Long, powerful jumping legs	Shorter legs for walking or hopping
Eggs	Frogs usually lay eggs in clusters, tadpoles live in water	Toads lay eggs in long chains; some toads do not lay eggs but give birth to live young, young live in water
Skin	Moist and smooth	Dry and bumpy
Habitat	Prefer aquatic or moist environments	Prefer dry environment but adapt to moist conditions as well.
Teeth	Frogs have vomerine teeth in their upper jaw.	Toads have no teeth.
Eyes	Eyes bulge out	Eyes do not bulge out, poison gland behind eyes
Food	Insects, snails, spiders, worms and even small fish	Insects, grubs, slugs, worms, and other invertebrates

Amphibians – Frogs & Toads ID Traits



Salamander ID features



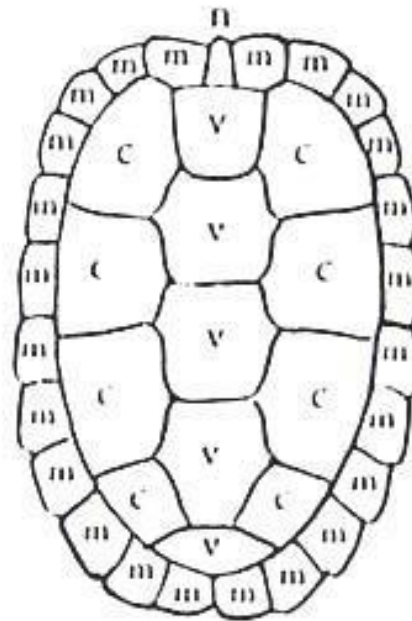
Turtles – ID Features

Turtle

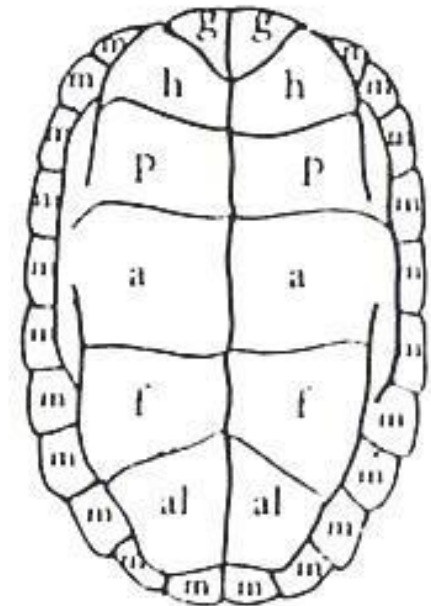
Scutes

- a-abdominal
- al-anal
- c-costal
- F-femoral
- g-gular
- h-humeral
- m-marginal
- n-nuchal
- p-pectoral
- v-vertebral

carapace (upper shell)



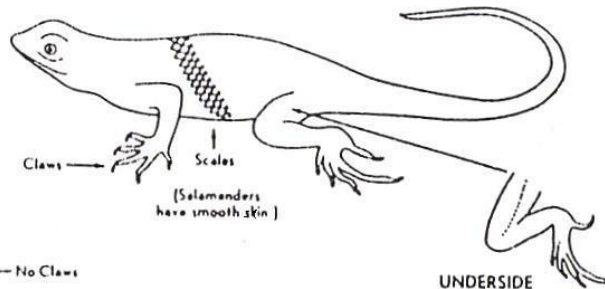
plastron (lower shell)



Lizards – ID features

LIZARDS

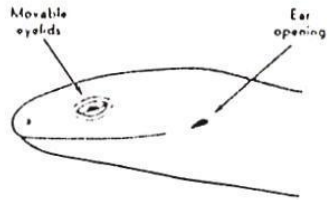
TYPICAL LIZARD
(Scaly Lizard)



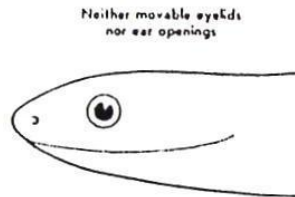
SALAMANDER
FOOT

UNDERSIDE
OF THIGH

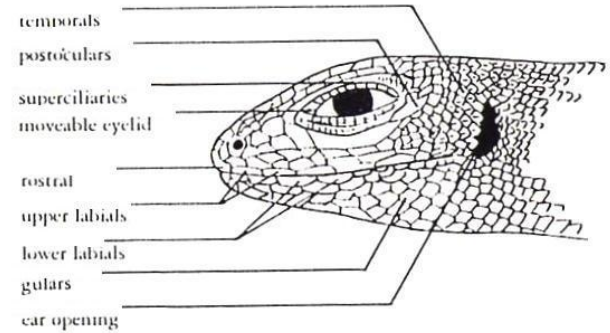
Showing femoral pores



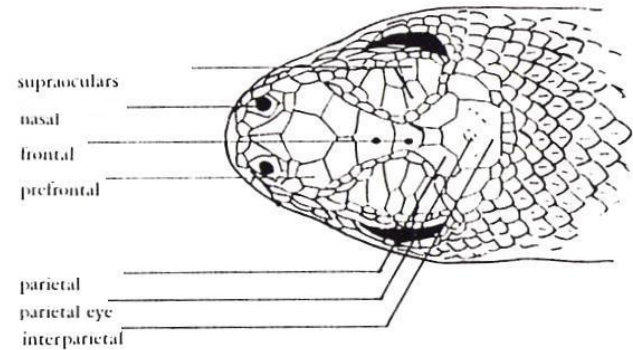
SNAKELIKE LIZARD
(Glass Lizard)



SNAKE
(Bocon)

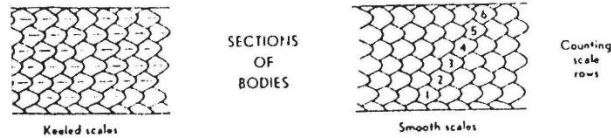
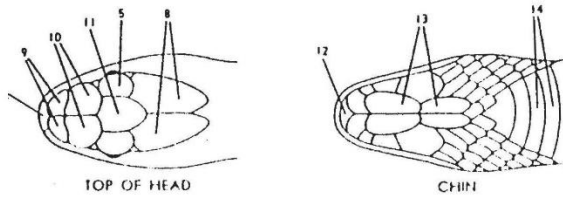
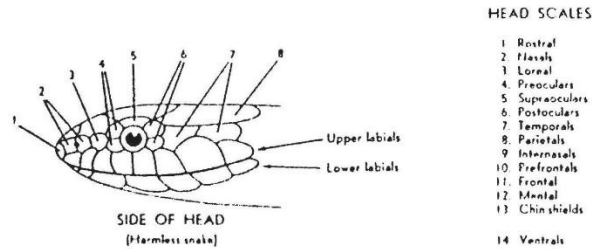


Lizard head (top view)

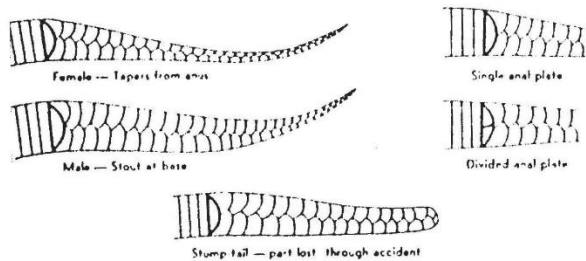


Snakes – ID features

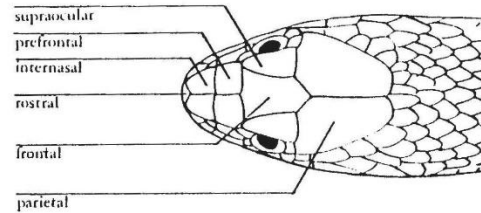
SNAKES



UNDERSIDES OF TAILS

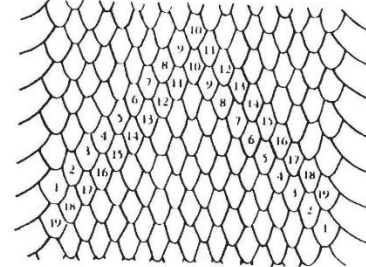


Snake head (top view)

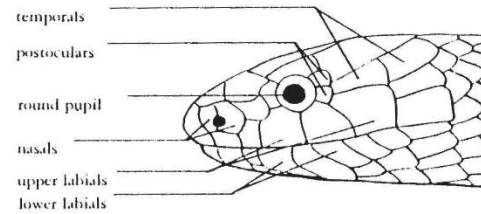


Snake scales

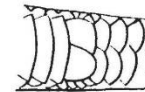
method of counting back scales (midbody)



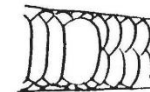
Snake head (side view)



ventral scales

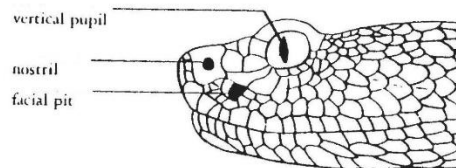


anal plate divided



anal plate single

Pit Viper (side view)



Ecology Impacts*

- **Importance of ectothermy**
- **Economic importance**
- **Bio-indicators**
- **Functional role in ecosystems**
- **Longevity of some species – 50+ yrs**
- **Status and conservation**
- **Habitat destruction**

Decline of Amphibians*

- **Their highly permeable skin is more immediately sensitive to changes in the environment, including changes to freshwater and air quality**
- **Air and water pollution**
- **Habitat are being destroyed for human development**
- **Consumer demand**

Decline in Reptiles, Turtles, Crocs *

- **Habitat loss & degradation**
- **Invasive exotic species**
- **Environmental Pollution**
- **Unsustainable use**
- **Global climate change**
- **Life history – some do not reproduce until later in life – some turtles 18 yrs.**
- **Top of food pyramid – indicators of environmental health.**



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