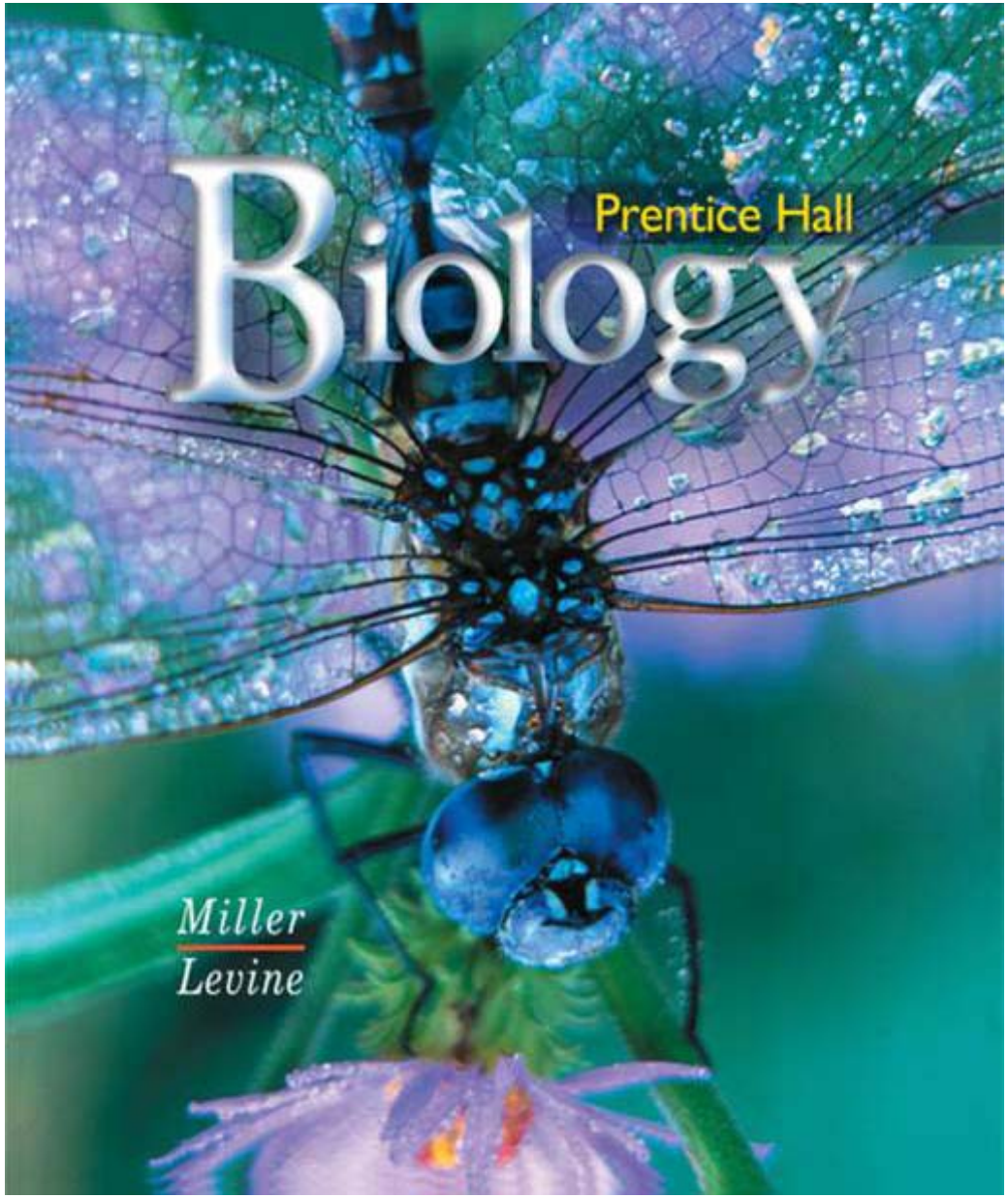
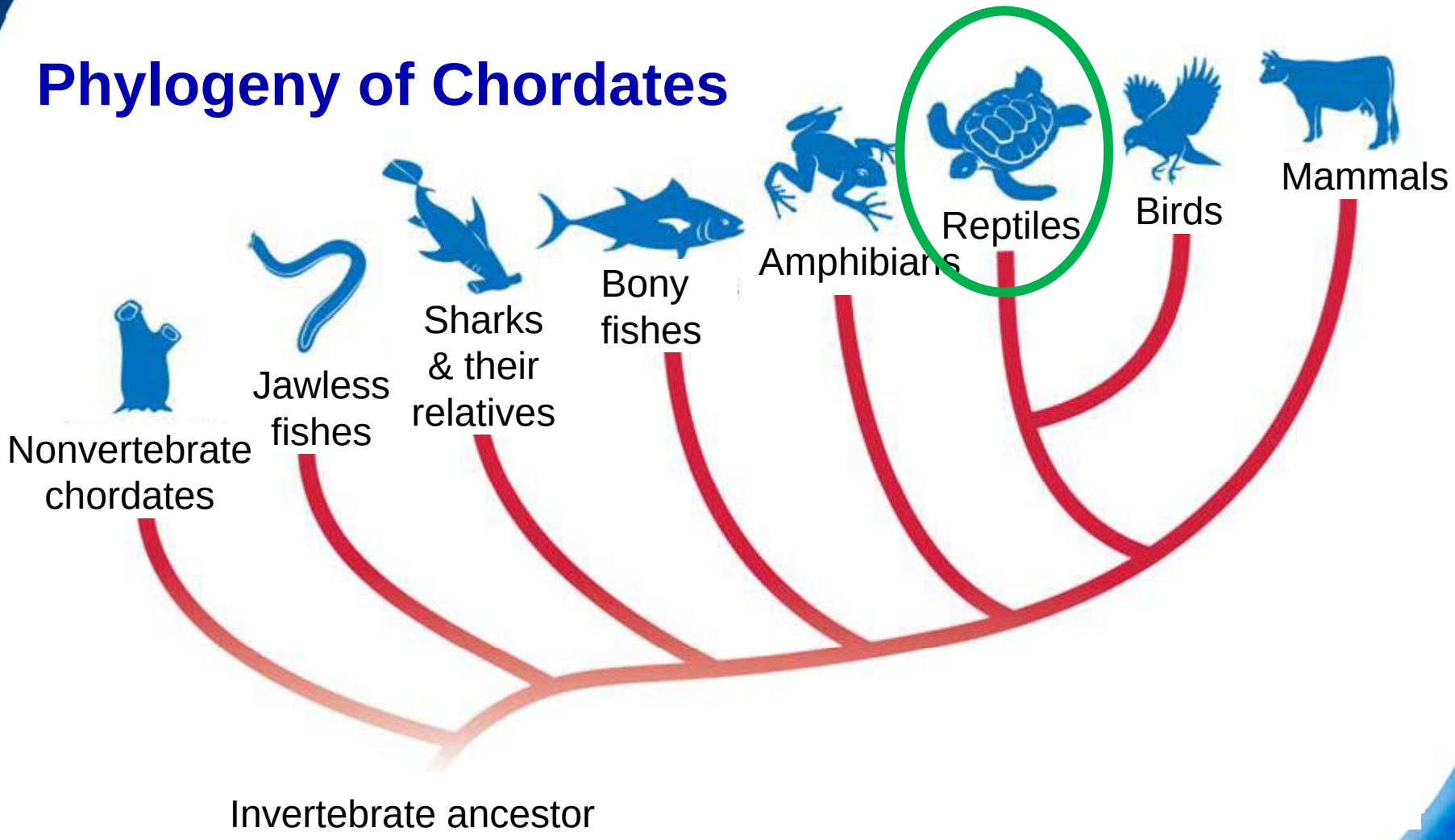


31-1 Reptiles

Phylogeny of Chordates



What is a reptile?

- A vertebrate
- dry, scaly skin
- lungs
- terrestrial eggs with several membranes
- Can live their entire lives outside water
- Why is a tough, scaly layer of skin a disadvantage to reptiles? p797

Form and Function
p800-802

- well-developed lungs
- a double-loop circulatory system
- a water-conserving excretory system
- strong limbs
- internal fertilization
- shelled, terrestrial eggs

Body Temperature Control

All animals you have learned about so far are **ectotherms** – temperature is controlled by picking up heat from or losing heat to, their environment. Turtles, snakes and other reptiles are also ectotherms.

Ectotherms warm up by basking in the sun or stay under water at night. To cool down, they move to the shade or take shelter in underground burrows.

Body Temperature Control

Ectotherms:

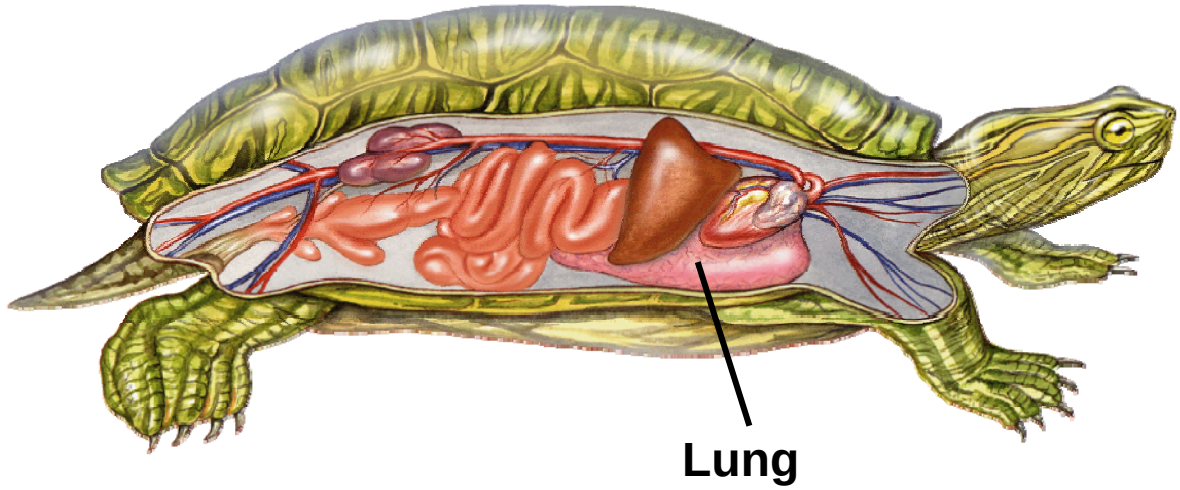
- They have low rates of metabolism when resting
- When ectotherms are active, their muscles generate heat, but the heat is lost easily to the environment.

Feeding
p800

- Reptiles eat a wide range of foods.
- Have long digestive tracts – enables them to break down plant material.
- Most reptiles eat insects.
- Iguanas are herbivores, snakes, crocodiles and alligators are carnivores.

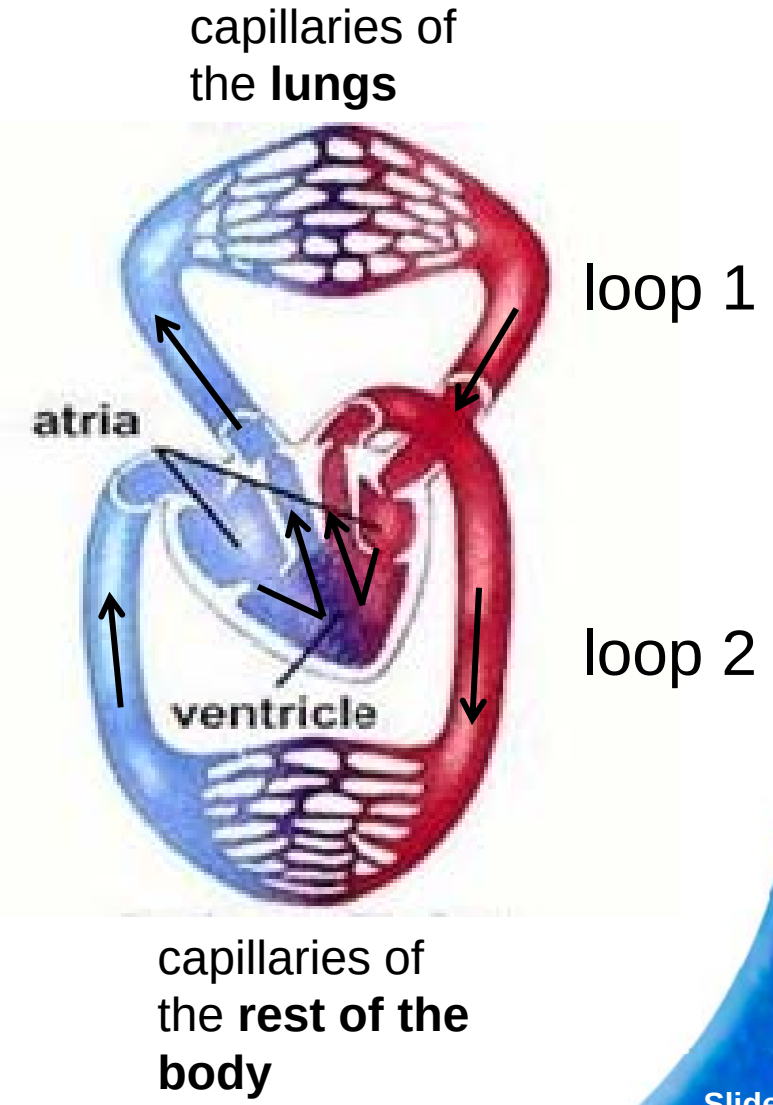
Respiration
p800

- Lungs – 1 or 2
- Cannot exchange gases through their skin.
- Have muscles around their ribs that expand the chest cavity to inhale and collapse the cavity to force air out.



Circulation p800

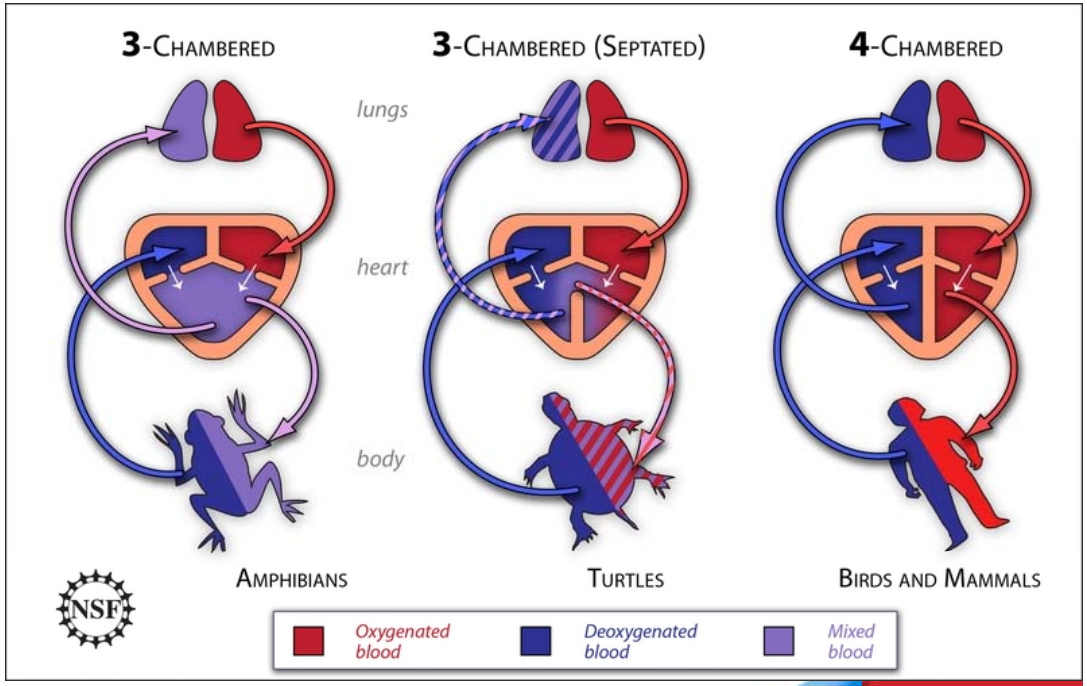
- Double loop circulatory system
- The 1st loop brings blood to and from the lungs
- the 2nd loop brings blood to and from the rest of the body.



Circulation
p800

- **Heart has 3 or 4 chambers** – two atria and one or two ventricles. If one ventricle, it is partially divided by a septum or wall that helps separate oxygen poor and oxygen rich blood.

- Figure 31-4: flow of blood through a turtle's heart

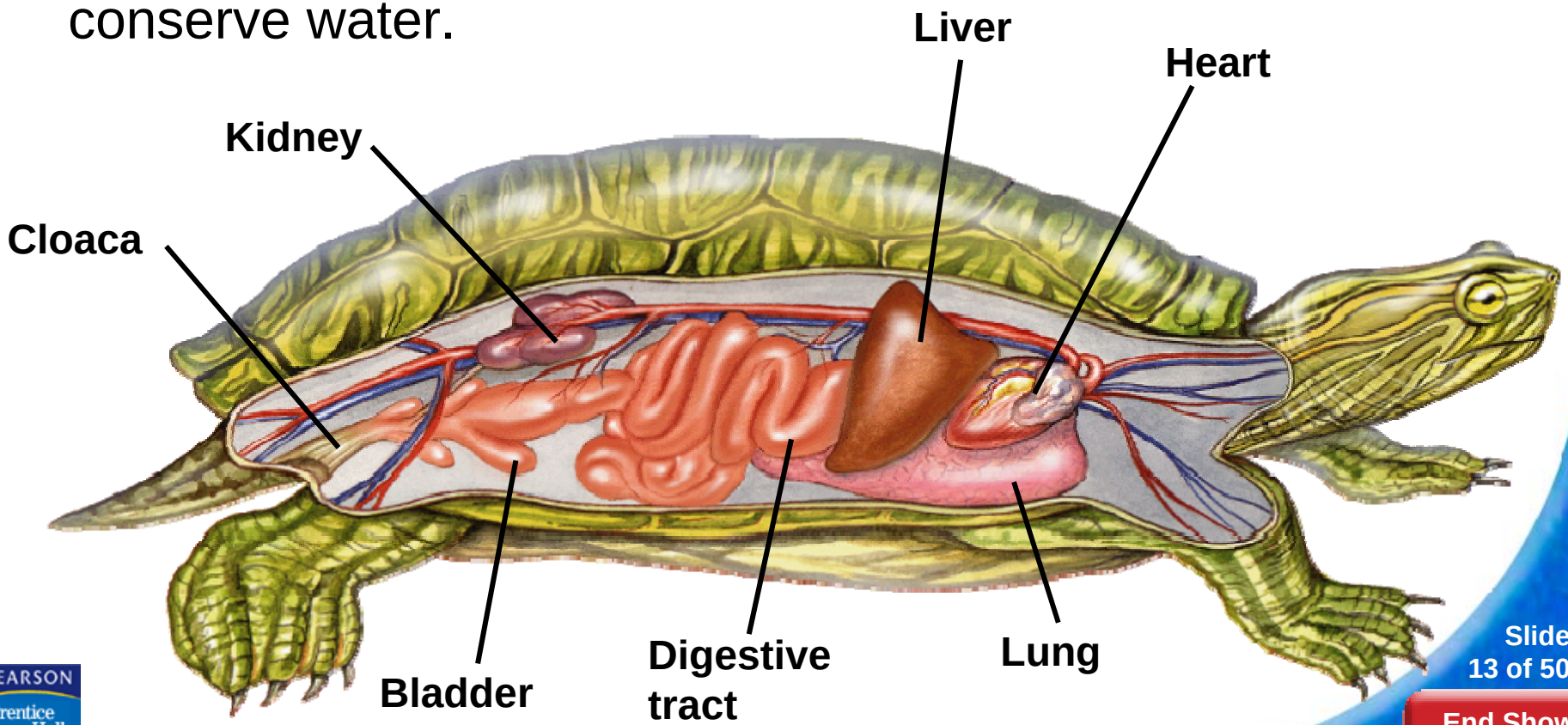


Excretion
p801

- Urine is produced in the kidneys.
- Urine contains either ammonia or uric acid.
- Reptiles that live mainly in water such as crocodiles and alligators excrete their nitrogenous waste as ammonia.
- Terrestrial reptiles tend to convert ammonia to uric acid. Uric acid is less toxic than ammonia so it does not have to be as diluted as much as ammonia does.

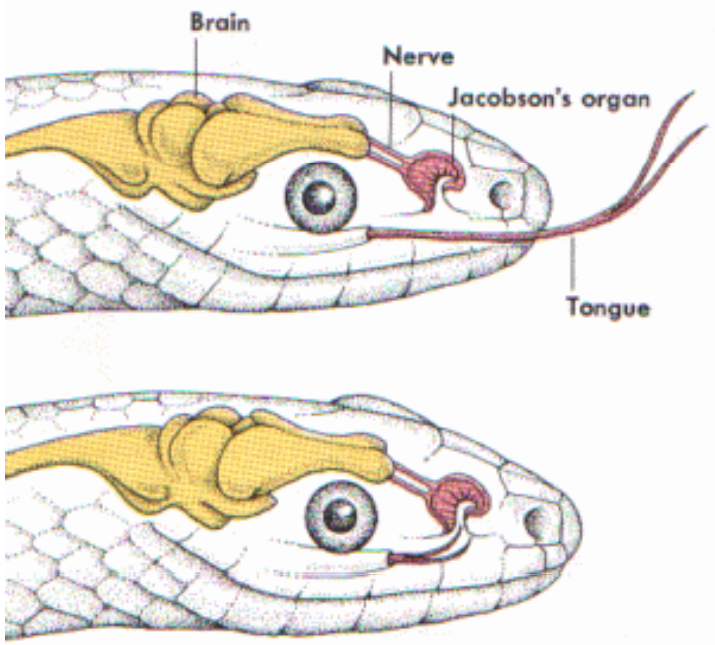
Excretion

- Excess water is absorbed in the cloaca, reducing urine to crystals of uric acid that form a pasty white solid.
- By eliminating wastes that contain little water, a reptile can conserve water.



Response p801

- Brain is similar to that of an amphibian, although the cerebrum and cerebellum is larger in reptiles.
- Reptiles that are active during the day have complex eyes and can see color well.
- Reptiles have a pair of nostrils and a pair of sensory organs in the roof of the mouth that can detect chemicals when the reptiles flick their tongues.
- Have simple ears



Movement
p802

- Reptiles with legs tend to have stronger, larger limbs that enable them to walk, run, burrow, swim or climb.
- Legs tend to be rotated further under the body enabling reptiles to carry more body weight.

- The legs and feet of many aquatic turtles have developed into flippers.

Reproduction

- All reptiles reproduce by **internal fertilization**, in which the male deposits sperm inside the female's cloaca.
- Most reptiles are **oviparous**, laying eggs that develop outside the mother's body.

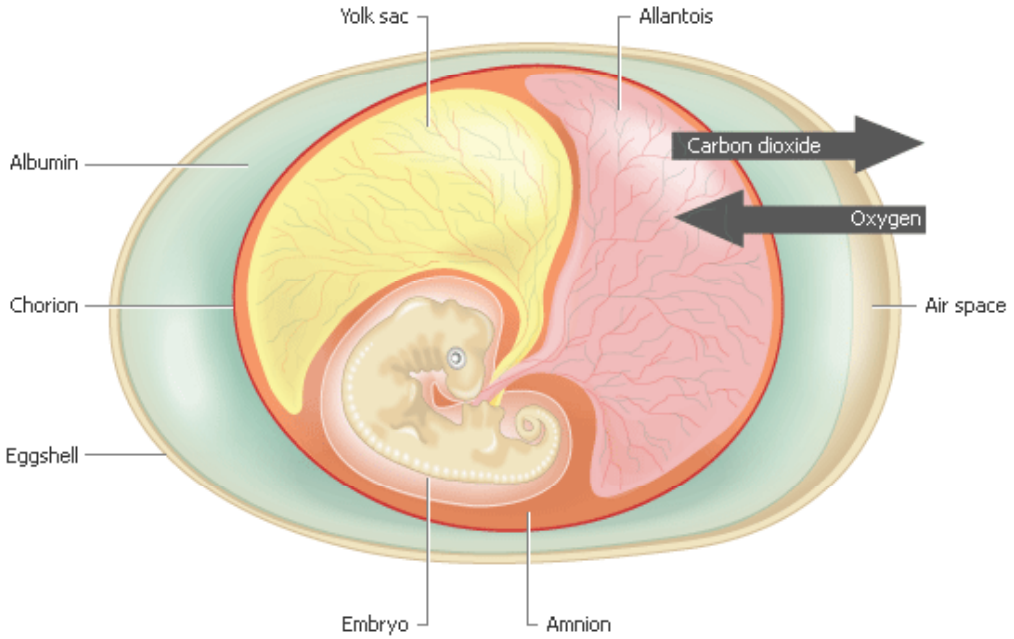
Reproduction

- Unlike an amphibian egg, which almost always needs to develop in water, the shell and membranes of a reptilian egg create a protected environment in which the embryo can develop w/o drying out.
- This type of egg is called an **amniotic egg**.
- An amniotic egg is one of the most important adaptations to life on land.

The shell and membranes protect the embryo and prevent the egg from drying out.

An amniotic egg has four membranes

i. Amnion
ii. Chorion
iii. Yolk sac
iv. Allantois.



Dinosaurs were reptiles

- "Dinosaur" is a combination of two greek words: *deinos* meaning "terrible" and *sauros* meaning "reptile".
- Dinosaurs disappeared 65 million years ago, during a mass extinction caused by a dramatic series of natural disasters.
- The only descendant of dinosaurs living today are not reptiles, but the birds.

Groups of Reptiles

The four surviving groups of reptiles are:

- **lizards and snakes** – p803
- **crocodilians** – p804
- **turtles and tortoises** – p804
- **tuatara** – p805

Lizards

Most lizards have four legs and clawed toes.

Most lizards have external ears and movable eyelids.

Some lizards have evolved into highly specialized forms.

Video on Toxic Komodo Dragon (2min23):

https://www.youtube.com/watch?v=NmxMirUlmNk

Snakes

Snakes have no legs.

Snakes have immovable eyelids and no external ear openings.

Snakes are efficient predators.

Crocodilians

Crocodilians have long, broad snouts and a squat appearance.

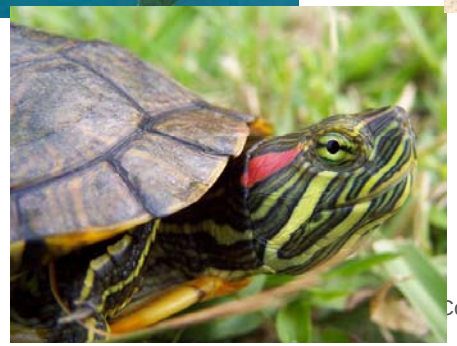
They prey on animals such as fishes, deer, and even humans. **Includes Crocodiles and Alligators**

Turtles and Tortoises

Turtles live in water.

Tortoises live on land.

A **terrapin** is a turtle that lives in water that is somewhat salty.

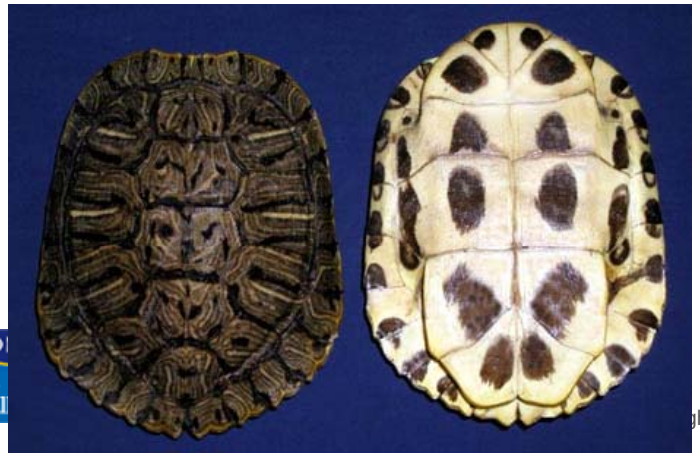


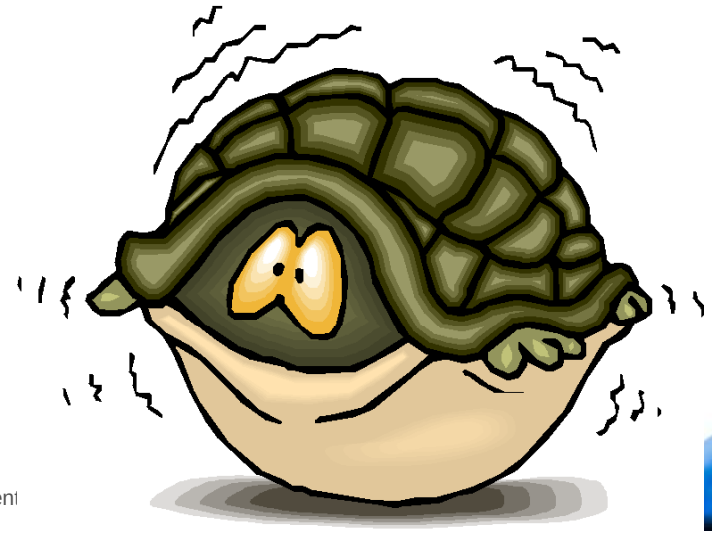
Turtles and tortoises have a two-part shell built into the skeleton:

- a dorsal part, or **carapace**
- a ventral part, or **plastron**

The head, legs, and tail emerge from holes where the carapace and plastron join.

Tortoises and most turtles pull into their shells for protection.





Video on turtle journey (2min):

https://www.youtube.com/watch?v=89L63GKMhwA

Tuataras

Tuataras are found only on a few islands off New Zealand.

They lack external ears and retain primitive scales.

They have a "third eye," which is part of a complex organ located on top of the brain.

Ecology of Reptiles
p805

- List 5 ways that reptiles are adapted to life on dry land.
- Why can reptiles tolerate hot, dry climates more than amphibians can?
- What would happen to reptiles if conditions on Earth became permanently warmer and much damper?