

### 3. *Snakes*

Snakes are reptiles of the order Squamata. Snakes evolved from lizards. They lost their legs for a life underground, then along their evolutionary path, they emerged from underground for life above ground, but adapted to life without legs. Primitive snakes like Boas retain vestigial pelvic and limb bones as evidence that snakes evolved from lizards.

Snakes, along with lacking legs, also lack eyelids and external ear openings. Snakes lack eardrums, but they can feel vibrations and are sensitive to ground vibrations that help them locate prey. Different snakes have different diets, but prey includes lizards, birds, small mammals (for large pythons, even large mammals), fish, amphibians and other reptiles including snakes. Snakes are solely carnivorous and different snakes have adaptations that help them locate and kill prey. Pit vipers, including rattlesnakes, have heat-sensitive pits located between the eyes and nostrils that are sensitive to minute changes in temperature; these heat receptors help pit vipers find prey during the night.

Snakes have loosely articulated jaws that enable them to swallow prey larger than their mouths; in fact, most snakes can swallow prey larger than their own body diameter.

Snakes locate prey mainly through an acute sense of smell; however, snakes smell mainly with the aid of their tongues. Snakes *do not* smell with their tongues, but instead use their tongues to collect scent particles that are delivered to the Jacobson's organ, located at the front roof of the mouth. The Jacobson's organ is a specialized organ that is very sensitive to minute scent particles.

Snake vision varies greatly among different species of snakes. Certain snakes, like rat snakes, have very good diurnal vision, while other snakes, like Emerald tree Boas, have excellent nocturnal eyesight that enables them to catch prey. Other snakes, like Boa constrictors, have limited vision mainly relying on smell to locate the prey then using their limited vision to sense motion around them.

Snakes, like other reptiles, are ectothermic; therefore, they must regulate their body temperatures by basking in the sun to warm up and find shade or cover to cool down. How snakes bask varies depending on the snake. Arboreal snakes commonly bask on outward branches of trees; while terrestrial snakes will venture out of cover to an open area. It is common to see nocturnal snakes on a blacktop road after dark, absorbing heat from the still-warm road. Some snakes that live in warmer climates do not need to bask since the ambient air temperature is warm enough for the snake. The biggest challenge to the warm-climate snakes is not getting warm, but cooling off. Some go underground, such as the rattlesnakes of Florida, and some, such as the cottonmouth, go into swamps or water.

## Snake Bodies:

All snakes have the same body structure. A head, body, and tail.

The head comes in many shapes, from rounded to triangular, and includes the sense organs – eyes, nose, tongue, heat pit (in pit vipers) and Jacobson's organ. The body can vary in length according to the snake, but all snake bodies are made up of a long series of vertebra with ribs. After the vent (excretory opening) in the body comes the tail, consisting of a series of smaller tapering vertebra.

For the most part, snakes are very muscular. These muscles are vital for snakes to move with a series of perfectly timed muscle contractions. Snakes can move in different ways: 1, Caterpillar – the snake moves in a straight line using its muscles and ribs to grip the ground and propel it forward. 2, Concertina – the snake makes a series of S's in its body, stretching and contracting the S curves to move forward. 3, Side-winding – similar to concertina in that the snake makes a series of S curves, but the snake moves sideways lifting and setting the S curves of the body forward. 4, Waves – similar to caterpillar except that the body is curved in a series of S's. All snakes can swim; some swim more than others. They use the concertina pattern of motion in swimming.

The muscular body also helps in catching prey. All snakes use their muscular bodies to strike prey, but some snakes, the constrictors, use their muscles to constrict and asphyxiate their prey. Constricting snakes do not crush their prey but, instead, wrap tightly around preventing the prey from being able to take in oxygen.

Some snakes are venomous; this venom is used mainly to kill prey, but in some species also used as a form of defense (spitting cobras). Venomous snakes have special venom-producing glands located at the rear of the jaw. These glands, when constricted by muscles, push venom through a duct into a hollow tooth called a fang. The fang acts as a hypodermic needle, injecting the venom into its victim. Venom is a mixture of enzymes and specialized proteins. Some enzymes start the digestive processes, actually digesting prey from the inside. This is beneficial to the snake by speeding up the digestive process. The venom also contains enzymes that form toxins to kill or immobilize their prey. There are two general forms of toxins: 1, *neurotoxins* that attack the nervous system and results in heart or respiratory failure 2, *hemotoxins* that attack the blood vessels, cells, and muscle tissue causing loss of motor skills and destruction of tissues.

Venomous snakes are not poisonous. Poisons are chemicals that are taken either orally or absorbed through the skin or tissues. Venom is produced in a living creature and injected directly into the body. We can safely eat venomous snakes.

There are five venomous snakes in Florida: the eastern diamondback rattlesnake, pygmy rattlesnake, cottonmouth (water moccasin), coral snake, and copperhead.

Snakes have a protective outer layer of skin consisting of overlapping scales. These scales are made up of keratin (the same substance fingernails and hair is made of) and cover the entire body, including the eyes. This outer layer of skin is shed many times a year. The shedding helps heal wounds, rids the snake of parasites, growth and general health. Snakes usually shed their skin in one piece. Starting from the head, the skin peels off as the snake moves over the ground.