

## **Year of the Snake Slide Show Script**

### **Created for PARC's Year of the Snake campaign – 2013**

1. **Welcome to this Year of the Snake program.** Partners in Amphibians and Reptile Conservation (PARC) is working hard this year to raise awareness about snakes and their important role in our world. (Introduce yourself and the host organization). Today we will talk about how snakes live and interact with their environment, as well as some challenges and successes in snake conservation.
2. **Snakes are fascinating creatures and can be found in many habitats around the world.** They live in many different types of habitats; forests, deserts, jungles, even the ocean. Snakes live in almost all countries except islands like Iceland, Greenland, Newfoundland, Ireland, and New Zealand, and very cold places like Antarctica and the far reaches of the arctic. There are around 2,700 species of snakes in the world. The United States is home to about 115 of these. We'll look at some basic snake biology and then move on to snakes' role in our ecosystem.
3. **How well a snake sees varies among species.** Some snakes which rely on sight to hunt like Garter Snakes have large eyes and appear to have fairly clear vision. Pit vipers (like rattlesnakes) can also see in the infrared spectrum. Their pit organs allow them to detect heat sources very accurately.
4. **Snakes do not have external ear openings,** although they do have an ear bone. Snakes hear with vibration – sounds travel along the ground and are transferred by muscle and bone to the ear.
5. **Snakes can smell with their noses, but they have developed an alternative method too.** Snakes use their tongues to collect particles in the air. These particles are passed to the Jacobson's organ on the roof of the mouth, which then processes the smell. The forked tongue allows them more accurately determine the location of scents.
6. **Snakes have specially designed jaws that allow them to swallow prey much larger than their heads.** The lower jaw is made of two parts which can move independently, allowing snakes to work food into their mouths. Because of the unique jaw attachment, snakes can swallow food larger than their heads. Snakes swallow their food whole and don't chew it. The powerful digestive juices can consume the whole animal—bones, fur, feathers, and even teeth. Some snakes are generalists and will eat whatever they find, other specialists and have unique adaptations to eat certain types of food.

7. **Snakes use three basic methods of subduing prey.** Grab and Go eaters feed on prey that generally doesn't back – like worms or frogs. They simply swallow the prey without killing it first. Constrictors squeeze their prey, killing by either suffocation or cardiac arrest before eating it. Venomous snakes use different types of venoms to subdue or kill prey before swallowing.
8. **One of the most common questions about snakes concerns the differences between venomous and non-venomous snakes.** Only about 1/5<sup>th</sup> of the world's snakes are venomous. Venomous snakes have fangs used to deliver venom. Other general characteristics of venomous snakes include slit pupils, and pit vipers have heat-sensing pits between the eyes and nostril. Venomous snakes typically have arrow-shaped heads to accommodate venom glands. Of course rattlesnakes have rattles. These are basic generalizations (the elapids – cobras, coral snakes, etc. – do not have heat pits and slit pupils) - the best way to identify a venomous snake is to learn what snakes inhabit your area and become familiar with their markings.
9. **Snakes have a variety of reproductive techniques.** Many snakes (like milk snakes and kingsnakes) lay eggs which develop outside the mother's body (oviparity). Other embryos develop inside eggs retained in the mother's body. They babies are born live, but they are nourished by egg yolk, not the mother's body (ovoviviparity). This is common among pit vipers. Other snakes (boa constrictors) have truly live birth, where the babies are nourished by the mother inside her body, resulting in true live birth (viviparity).
10. **Snakes can climb, slither, crawl, and swim.** Snakes use special belly scales in conjunction with muscle movements to push against the ground or anchor them as they climb. The Flying Snake of Southeast Asia glides through the air.
11. **What good are snakes? Snakes, like all other species, are an important part of their native ecosystems.** Snakes are both predator and prey – thus an important part of food webs. They feed mostly on small mammals, birds, amphibians, other snakes, lizards, fish and insects and in turn are prey for other species, primarily birds, snakes, and medium-sized mammals. In some ecosystems, they are very important for control of rodent and insect populations. Removing snakes from the food-web can lead to the changes in other animal populations, which can in turn lead to changes in plant communities, often resulting in degraded or altered environments.
12. **We are only now scratching the surface of medicinal uses of venom.** For example, Malayan Pit Viper venom is being used to break down blood clots in the form of a drug called Ancrod. Copperhead venom shows promise in the fight against breast cancer. Other diseases or disorders which may benefit from venom-derived drugs include Alzheimer's, Parkinson's, asthma, arthritis, and high blood pressure.

13. **Snakes are a great tool for teaching people the value of conservation.** Children are often fascinated by snakes. Snakes used in educational displays evoke a great deal of emotion and can give people an opportunity to observe, touch, and interact with an animal they don't get to see every day—and perhaps begin to lose their fear of the creatures. This creates a fantastic environment for people to learn more about and appreciate the value of these species. Snakes are also model organisms for the study of certain aspects of biology such as spatial, thermal, and foraging ecology.
14. **Snakes are very aesthetically appealing, with a variety of patterns and colors and graceful movements.** Imagine yourself in a rainforest in Indonesia—lush trees and the smell of the damp earth. Complete the picture with a beautiful Green Tree Python draped over a branch, its lovely scales shimmering like emeralds. At that moment, there could be no denying the beauty of these animals and the thrill of seeing a snake wild and free in its natural habitat.
15. **Snakes have intrinsic value, meaning they are important just because they are,** because they belong here like all other species on our planet, and we, as fellow animals, do not have the right to be a part of their decline. Snake species deserve to flourish just as all other species do, because they belong in their natural habitat.
16. **Like most species, snakes suffer from loss and fragmentation of habitat.** Snakes need to hunt for prey, mate, and travel from overwintering sites to summer foraging sites and in doing so, they often move widely across a landscape. This can force snakes to cross roads, agricultural lands, and other developed or degraded areas, which can all result in increased mortality rates or reduced gene flow.
17. **Human Persecution is rampant – particularly against venomous snakes.** Many people have an irrational fear of snakes. An excellent example of the extent of human persecution against snakes involves a study conducted in Kansas, where 8 out of 10 drivers were found to intentionally hit snakelike objects placed on the road. Unless you accidentally or intentionally harass a snake, chances are, the snake wants to avoid you more than you want to avoid the snake. If you see a snake in the wild, leave it alone.
18. **Some snake species are so charismatic and unique that they are heavily exploited for the pet and skin trade.** Currently, the use of snakes is not managed as well as game species are. Frequently there are no seasons, or limits established. Worse, the take of snakes is largely untracked, so we don't know all the impacts of removing snakes from the wild. This threat is manageable; it is possible to implement collection regulations that still allow the sustainable use of snakes. This slide shows snake dealers in Indonesia.

19. **The introduction of invasive species into an ecosystem can often harm snakes.** The introduction of feral hogs into the Longleaf Pine ecosystem has affected many species, including Eastern Indigo Snakes. Feral hogs uproot Eastern Indigo nests, and may kill and eat juvenile snakes as well. In addition, there are invasive snake species that affect other native snakes, such as the invasion of pythons (pictured) into the Everglades in Florida, USA. Pythons have essentially taken over this ecosystem and decimated rodent and bird populations, minimizing prey availability for other snake species.
20. **Because snakes are ectotherms (obtaining most of their body heat from the environment), they make great indicators of climate change** Studies indicate that snakes will be negatively affected by climate change because they cannot evolve or migrate fast enough to keep up with the changes in suitable habitat. For example, a study conducted by the University of Indiana Bloomington found that, although an initial increase in temperature may expand the range of Timber Rattlesnakes in the eastern United States, an increase of 6.4 degrees in temperature would eventually displace this species from its range entirely.
21. **An example of a snake conservation success story can be found in the Lake Erie Watersnake** which was removed from the U.S. endangered species list in August of 2011, after being listed in 1999. Found only on the islands of Lake Erie, this species was most threatened by human persecution in the form of intentional killing, and loss of habitat due to shoreline development. The federal government and state agencies implemented intensive public outreach programs aimed at educating people about the importance of this species to local ecosystems and afforded protection to the remaining habitat used by Lake Erie Watersnakes. The local community became enthusiastic about the protection of this species when informed of its importance in keeping in check populations of Round Gobies, an invasive fish species in Lake Erie.
22. **What can you do?** Become a member of a snake conservation group, Don't collect snakes from the wild, Report your findings, create habitat, and most importantly, educate yourself and spread the word to friends, co-workers, and family.
23. **Thank you for your interest in Year of the Snake.** To learn more, follow YOS on Facebook, or log onto the website to get updates and download the YOS monthly newsletter and calendar.