Snakes – Amazing Adaptations

Meets 4th Grade Next Generation Science Standards
California Visual Art Standard 2.3 - Paint or draw a landscape, seascape, or cityscape that shows the illusion of space.
Taking It Further - California Visual Art Standard 2.2 - Mix and apply tempera paints to create tints, shades, and neutral colors.

Animal to Draw for Art Contest – A snake

Writing prompt for the sentence of the back of the student's drawing – Describe one amazing adaptation your snake has and how that adaptation helps it to survive.

Objective – To learn some of the amazing adaptations that have allowed snakes to thrive for millions of years.

Time – 20-30 min

Background – Snakes most basic adaptation is the shape of its body. Their lack of arms and legs allows them to get into small areas that other predators can't get into. They have evolved many other adaptations (some listed below) that have allowed them flourish.

Vocabulary –
Adaptation – a modification of an animal or plant that makes it more fit to live in its habitat.
Jacobson's Organ – the two small pits on the roof of a snake's mouth that assist with their sense of smell.
Quadrate Bone – the bone that connects a snake's lower jaw to the skull, it acts as a double-jointed hinge to allow the mouth to open extra wide to swallow prey.

List of Adaptations -
Can enter narrow holes made by rodents
Can slither through grass or among rocks without causing a disturbance
Unusually flexible jaw with the quadrate bone, enabling them to swallow large prey
Snakes come in an incredible variety of colors and patterns, some for camouflage to avoid detection and some are very bright as a warning to other animals
Rattlesnakes have rattles on their tail that can be shaken to make a very loud warning sound
Common garter snakes are equipped with glands that exude a very smelly substance when the snake is disturbed
King snakes have a tolerance towards rattlesnake venom which enables them to kill and eat rattlesnakes
Rat snakes can climb up tree trunks
Gopher snakes can imitate rattlesnakes by flattening their heads and shaking their tail in dry leaves

Backward facing teeth to keep food moving in the right direction
Forked tongue to deposit scent molecules into a special section of the nasal cavity called the Jacobson's organ, where the odor is sensed

Materials – images of many different snakes showing: camouflage, tongue, rattle, etc.

Directions –

1. Break the class up into small groups of 3-5 students.
2. Review the many snake adaptations that have been discussed.
3. Explain to the groups that they will be designing their very own snake. Ask guiding questions, such as: Will it be large and slow or small and fast? Will it be camouflaged so it can't be seen, or will it have bright colors to warn would-be predators?
4. In their groups, the students will work together to determine what their snake will look like, what it eats and then draw a sketch of it. Each student should suggest at lease one characteristic for the group's snake. Have each group present their snake to the rest of the class and show their sketch.

Questions for discussion – How does a snake's lack of arms and legs actually help it to survive? What behaviors do they show because of the lack of arms and legs? How is their movement different from other reptiles like lizards? Are there other animals that have adapted the lack of arms and legs? (Yes, the legless lizard!) How does a snake's forked tongue help it to smell? What other unique senses do snakes have? (How do they hear? Or do they hear?)

Website/books/other resources – *A Snake Mistake* by Harriet Ziefert and Mavis Smith
Snakes: Biggest! Littlest! by Sandra Markle
The Snake Who Was Afraid of People by Barry Louis Polisar and David Clark
Vernon and the Snake by Crystal J. Stranaghan (Suggestion: You can read this story from Vernon's perspective and then turn it over to hear the snake's version of the story.)
SF Gate 2000, San Francisco garter snakes relocated during construction - http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2000/01/27/MN70501.DTL
http://montereybay.com/creagrus/CAsnakeSFGarter.html
http://www.californiaherps.com/snakes/pages/t.s.tetrataenia.html

Taking it Further
Tongue Twisters
Sam saw a sneaky slimy snake in the sandbox.
The silly snake swam slowly in the stream.

Conservation Action – San Francisco garter snakes live near ponds and marshes where they have easy access to their primary food source, red-legged frogs. Wetlands like these are disappearing due to development and are sensitive to pollution. One great way to help take care of your local ponds and marshes is to conserve water. Here are a couple of easy ways you can help:

- While waiting for hot water to run from your faucet, collect the cold water and use it to water indoor and outdoor plants.
- Take shorter showers – challenge your family members to see who can take the shortest shower and still get clean!

Source - http://www.backyardnature.net/snakadap.htm