How Do Snakes Move?

Grade Level: 1ˢᵗ grade.

Duration of Lesson: ~ 1 hour.

Science Concept: This lesson is designed to teach students how snakes move.

Science Content Standard: 2.a. *Students know* different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

Learning Objective: Students will get at least two out of three answers correct on worksheet, and will correctly mold and label his/her snake showing a locomotion.

Conceptual Background: Animals use muscles to move their bodies, which propels them forward. This is known as locomotion. Locomotion takes many forms. Humans walk on two legs, tigers run on four legs, eagles fly using wings, and fishes use fins. So, since snakes don't have legs, how do they move around?
Snakes have three ways of moving around:

1. *Serpentine method:* This motion is what most people think of when they think of snakes. Snakes will push off of any bump or other surface, rocks and trees to get going. They move in an "S" motion.

2. *Sidewinding:* This method is similar to an inchworm's movement. The snake will lift the middle of its body up and then push it down forcing its head to move forward.

3. *Concertina*: A spring-like method, often used when a snake has limited space. Its tail and mid-body comes forward like a spring, and then pushes the head forward. The cycle is then repeated.

4. *Caterpillar (Rectilinear Method):* This is a slow, creeping, straight movement. The snake uses some of the wide scales on its belly to grip the ground while pushing forward with the others. We'll call it the *crawling* motion.

Lesson Implementation Plan:
Engage:
1) Gather the students in a large circle on the classroom floor. Start your lesson reading *The Great Snake Escape*, by Molly Coxe. This cute and short story will settle the students into the lesson.
2) Start by asking the students "How do animals move?" Ask for volunteers (by show of hand) to act out how certain animals move. Each student can mimic a different animal. Only one student at a time. Here are questions/ideas:
How does a cat walk?
How does a tiger run?

How does a fish swim?
How does a bird fly?
How does a caterpillar crawl?
Show me a kangaroo jumping.
Show me a dog sleeping (this is to show what is **not** a form of locomotion)
Show me a 1st grader walking.

2) Write on the board the word LOCOMOTION, and circle it. Ask the students if they know this word, or have ever heard of it. Follow the question with:
What did the cat do?
What did the tiger do?
What did the fish do?
What does a caterpillar do?
What did the bird do?
What did the kangaroo do?
What did the dog do (use only if you want to show what "not locomotion" is)
What did the 1st grader do?
(You may need the original actors to redo their motions if students forgot.)

Write all the answers around the circled LOCOMOTION, and making sure you have all the students' attention, draw lines connecting their actions to locomotion. Reinforce by telling them that locomotion means movement. It should look something like this:
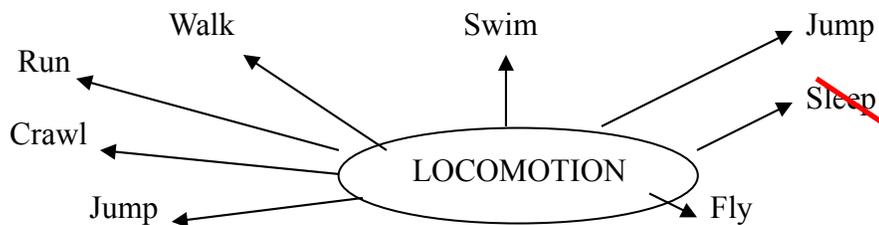
Explore: Now that we know about locomotion, tell the student that they are now researcher who need to find out: "How can snakes move if they don't have legs, arms or fins?"
1) Create small groups (three to four students).
2) Each group receives a large flat box filed with sand.
3) Each group is given one articulated wooden snake.
4) Give the students ~15 minutes to come up with TWO ways a snake could move in a direction. Tell the students they will have to share their discovery with the class.

Explain: Select one station and gather the students around it. Have each group come up and present the possible motions they came up with that a snake could use to move in a direction. The teacher will need to put into words or describe the action as each group present. This will help to fill-in the gaps.

Elaborate:
1) Show the following videos that depict four types of locomotion that snakes use.
- http://www.youtube.com/watch?v=ZKaYbMZqTkY&feature=related
- http://www.youtube.com/watch?v=qLMriz8l0P8&feature=related
- http://www.youtube.com/watch?NR=1&v=xo0pVlzUBc8
- http://www.youtube.com/watch?v=OSaHdeKeR7k&feature=results_video&playnext=1&list=PL80CF52EDBC18EF1A

2) Remind students that snakes have scales, and these scales, like our shoes, help the snake move. Scales give traction like bicycle tires for snakes to grab and push-off from.

Evaluate:
Summative: Students are to complete the locomotion questionnaire.
Formative: Groups present the two ways they think a snake may move forward.

Differentiation Plans:
Behavioral Student(s):
- Reinforce positive behaviors.
- Group students appropriately to facilitate mutual learning and support.
- Recognize any fine or gross motor skill issues that may impair student(s).

Cognitive for students A, B & C:
Strategies to enhance instruction would be:
- Introduction using literature.
- Promoting active observation skills.
- Promoting inquisitive questioning.

Affective D & ELL:
Strategies to enhance instruction would be:
- Introduction using literature or personal story.
- Combine physical movements with actions and action words.
- Promote inquisitive questioning.
- Using multiple standards during the "locomotion" project.

Strategies to facilitate English Language Learning Students would be:
- Speak slowly and clearly
- Allow time for reflection, use pauses, short sentences, and simple syntax
- Translated notes of key vocabulary words.
- Picture cards to ELL student with action words.
- Pair students with a peer that is bilingual.
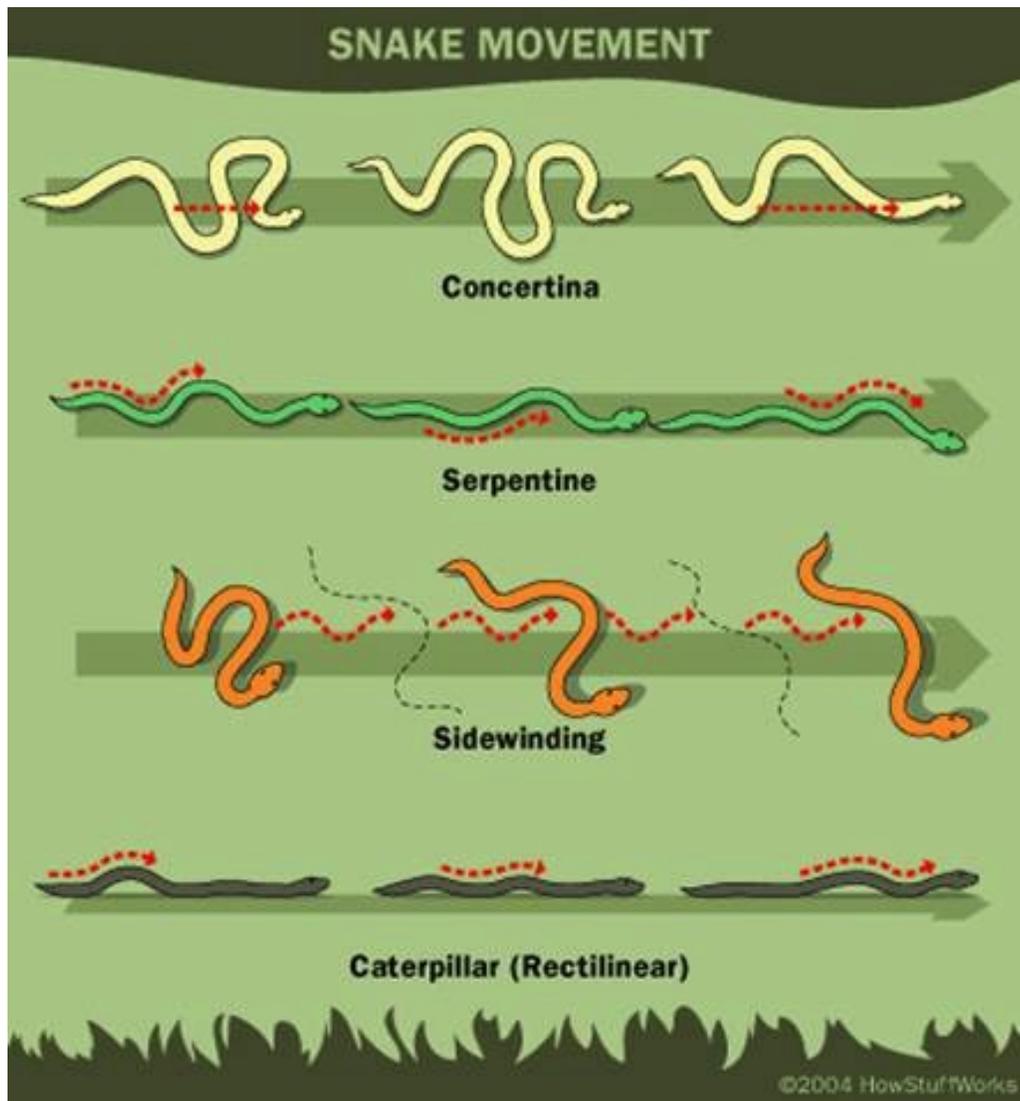- Use verbal, hands-on resources, and gestures.

Materials:
Sand bucket
Sand

Supporting Handout

Enlarge or project the snake movement picture to assist students in visually recognizing the different locomotion that snakes use.

This visual aide will also help them select and design their own locomotion for their clay snakes.

Suggested Reading:
Souza, D. M. (1992). *Slinky Snakes*. Minneapolis, MN: Carolrhoda Books, Inc.