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# Herptiles in Motion

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**Purpose:** Students will understand the purpose and mechanics of different types of locomotion used by reptiles and amphibians.

**Objectives:** Students will be able to compare and contrast different types of locomotion used by reptiles and amphibians. Students will be able to explain why certain adaptations are more beneficial in certain environments.

**Time Required:** 60min

**Appropriate grades:** 9th-12th Grade

**NGSS and Common Core Standards:**  
HS-LS4-2, HS-LS4-4

## Materials:

- Snake Skeleton
- Wooden Snakes
- Mystery Cards
- Locomotion Cards
- Powerpoint Presentation

## Activity:

<b>Introduction</b>	<ol style="list-style-type: none"><li>1. Review the differences between reptiles and amphibians. Create a venn-diagram and ask students to fill in what they remember about reptiles and amphibians. Facts that may be included are:<ol style="list-style-type: none"><li>a. Similarities: ectothermic (aka: cold blooded); lay eggs when reproducing; vertebrates (aka: have a backbone)</li><li>b. Differences:<ol style="list-style-type: none"><li>i. Reptiles:<ol style="list-style-type: none"><li>1. Skin: dry, scaly skin; shed and replace outermost layer of skin</li><li>2. Environment: able to live in drier environments</li><li>3. Eggs: hard or leathery eggs laid in nests or underground</li></ol></li></ol></li></ol></li></ol>
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	<ol style="list-style-type: none"> <li>4. Life Cycles: young reptiles are miniature versions of adult reptiles</li> <li>5. Defense: rely on claws, tails, and mouths; some have venom; scales act as armor</li> </ol> <p>ii. Amphibians</p> <ol style="list-style-type: none"> <li>1. Skin: thin, permeable skin</li> <li>2. Environment: prefer humid environments; stay near water sources</li> <li>3. Eggs: lay eggs with a protective membrane that adhere to underwater plants</li> <li>4. Life Cycles: metamorphosis; emerge as larvae; breath through gills until they develop lungs and can breathe on land; some never develop lungs and breathe through their skin</li> <li>5. Defense: secret toxins through skin</li> </ol> <p>2. Define <b>locomotion</b>:</p> <ol style="list-style-type: none"> <li>a. Reptiles are capable of various modes of locomotion, or movement, including: running, crawling, climbing, jumping, gliding, and swimming.</li> <li>b. Movement is crucial to survival. It allows animals to move efficiently from one place to another in search of food and water sources; it also allows them to quickly move away from danger.</li> </ol>
<p><b>Body</b></p>	<p>Locomotion</p> <ol style="list-style-type: none"> <li>1. Have students get into groups and discuss the ways that animals move around their environment.       <ol style="list-style-type: none"> <li>a. Ask students to then think about how reptiles and amphibians move. Have them demonstrate their theories through movement.</li> </ol> </li> <li>2. Locomotion Cards Activity       <ol style="list-style-type: none"> <li>a. Split into four groups</li> <li>b. Give each group a wooden snake and have students hypothesize how snakes move through their environment.           <ol style="list-style-type: none"> <li>i. Have each group demonstrate how they think snakes move using the wooden snake.</li> </ol> </li> <li>c. Give each group a snake locomotion card and one additional card           <ol style="list-style-type: none"> <li>i. Have the groups demonstrate/draw/use the wooden snakes to explain their type of locomotion</li> </ol> </li> </ol> </li> <li>3. Movement Mysteries       <ol style="list-style-type: none"> <li>a. Split into small groups</li> <li>b. Give each group a Movement Mystery Card</li> <li>c. Each group must come up with a potential answer for their question</li> </ol> </li> </ol>



	<ul style="list-style-type: none"> <li>d. They must then create a procedure for how they would test to see if their answer was correct</li> <li>e. Groups will share their proposed experiments with the class</li> <li>f. Groups will give each other feedback</li> <li>g. Optional: Groups can go through resources/research to determine what current theories/answers to the mysteries are</li> </ul>
<p><b>Closure</b></p>	<p>Closing Powerpoint:</p> <ul style="list-style-type: none"> <li>1. Quick overview of evolution <ul style="list-style-type: none"> <li>a. Define natural selection</li> <li>b. Define fitness</li> <li>c. Define evolution</li> </ul> </li> <li>2. Snakes <ul style="list-style-type: none"> <li>a. Ask class, what are the traits that differentiate snakes from lizards? <ul style="list-style-type: none"> <li>i. Unhinge jaw</li> <li>ii. Carnivorous</li> <li>iii. Venom</li> </ul> </li> <li>b. How does being a danger noodle help a snake survive in the wild? <ul style="list-style-type: none"> <li>i. What niche do snakes have?</li> <li>ii. How do snakes hunt? <ul style="list-style-type: none"> <li>1. Boa vs Rattlesnake</li> </ul> </li> <li>iii. How is being legless beneficial to snakes <ul style="list-style-type: none"> <li>1. Hunting, fleeing, climbing, swimming snake movement is versatile and flexible</li> <li>2. The first snakes were thought to have evolved as swimmers and burrowers where legs were inconvenient</li> <li>3. Snakes have no ears, instead using vibrations from the ground, having legs would hamper such a method of hearing, but it is likely this traits coevolved</li> </ul> </li> </ul> </li> <li>c. Discussion Question: <ul style="list-style-type: none"> <li>i. Originally, legs were lost in order to fulfill the empty fossorial niche, now snakes fill similar niches to limbed organisms and have in the past re-evolved legs, why have snakes not re-evolved legs then? Have they found other ways of movement in order to overcome the limitations of a limbless life? Are their secondary advantages to having no limbs?</li> </ul> </li> </ul> </li> </ul>



## Modifications:

- **Elementary:** Have students act out the different types of locomotion. This is best done in an open space where students have enough room to wiggle and move around.
- **Middle School:** Give students a photo of a type of environment (i.e. desert, forest, river, lake, etc.) and have them draw the types of reptiles and amphibians that may live there. Then, have students draw the path that animal makes based on the type of locomotion they use. Students can work alone or in small groups.
- **High School:** Have students study the types of locomotion used in animals other than reptiles and amphibians. Then, have them compare and contrast those types of locomotion to types used by reptiles and amphibians.

Created in December 2020 by Allison Barnes, William Beckett, and Laney Marcotte

## Additional Information:

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