

### **Lesson 3: Snakes are Cold-blooded!**

#### **An Elementary Science Lesson Plan Designed For Group Inquiry Based On The 5E Inquiry Model**

**GRADE LEVEL:** This lesson was designed for a 5<sup>th</sup> grade class.

**SCIENCE CONCEPT:** This lesson is intended to have students use their prior knowledge about warm-blooded animals to compare and transfer what they know to cold-blooded against.

#### **RELATIONSHIP TO CALIFORNIA SCIENCE CONTENT STANDARDS:**

- 2.b. Students know how blood circulates through the heart chambers, lungs, and body and how carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) are exchanged in the lungs and tissues.

#### **LEARNING OBJECTIVES:**

1. Students will describe and explain the differences between cold-blooded and warm-blooded organisms.

#### **EVALUATION IDEAS:**

1. formative: Students write and record their observations.
2. summative: Students write and explain the differences between cold-blooded & warm-blooded organisms.

#### **CONCEPTUAL BACKGROUND:**

Unlike reptiles, humans are warm-blooded animals which means they are able to maintain a constant internal temperature. In the case of humans, this is around 98.6 ° F or 37 ° C. It is through thermoregulation that humans have constant temperature. Skin helps in maintaining that temperature by either sweating and dilating or constricting blood vessels in the dermis. If the environmental temperature increases, blood vessels in the skin dilate and the warm blood is sent to the skin where it can lose its heat.

By comparison, snakes are considered to be cold-blood, which means they are unable to internally produce or regulate much of their body heat. Although they are cold-blood, their body temperatures need to reach a certain temperature for natural processes to occur, such as muscle activity and digestion. In order to regulate their temperature, snakes use a combination of behavior and physiological cues.

#### **LESSON IMPLEMENTATION PLAN:**

This lesson has been designed to be a group inquiry, level 2 where students will be asked a question: What are the differences between cold and warm-blooded animals? Students will investigate snakes, cold-blooded on their own with a written procedure.

ENGAGE- The class will discuss what it means to be cold-blooded verses warm-blooded. Students will make predictions on whether or not the play dough (given out in class) and their own temperature changed during the day and by being wrapped in a blanket. Students will be asked the following questions-

- “What does cold-blooded means?”
- “What does warm-blooded means?”
- “How do cold-blooded animals differ from warm-blooded animals?”

EXPLORE- Students divide into groups of 2 to 3 and receive two zip-lock bags containing play dough. Taking the zip-lock bags of play dough, groups will find two different locations, ideally one in the shade and the second in direct sun, to place the bags. They will measure the temperature of the play dough periodically throughout the days. Ideally those measurements would occur at the beginning of school, before lunch, and before the end of the day. The data collected will be noted on their worksheets. Before recess, students will take their own temperatures. After recess, they will take their temperatures a second time and record the results in their worksheets.

EXPLAIN- After the groups have gathered their data, they will discuss amongst themselves what they have noticed so far and the reasons for the results they are observing. While the groups are gathering their data and discussing amongst themselves, I will walk around to clarify any questions and to check the progress of each group. For the discussions, I will provide suggestions on the board for conversation starters.

ELABORATE- To elaborate on the learning of the same concepts in different contexts, I will provide an example of another animal that is cold-blooded that has similarities to snakes. Next students will do a Think-Pair-Share (TPS) on another animal they think might have similarities to the example given and the snakes

EVALUTE-

3. formative: Students write and record their observations.
4. summative: Students write and explain the differences between cold-blooded & warm-blooded organisms.

### **DIFFERENTIATION PLANS:**

Behaviors for Student A

If a student consistently did the opposite of what was told, I will make sure the student understood the activity procedures and was placed in a group that would be stay on task and not get distracted easily.

Cognitive for Student B

If a student needs extra-time, I will have them at least complete the data section of their worksheet and have them verbally say their responses instead of writing them down.

#### Cognitive for Student C

If a student had trouble sitting still, I will have them become the class helper and have them in a group that will stay on task.

#### Affective for Student D

If a student does not appear to show a real interest, I will have that student be in charge of finding the spots to place their zip-lock bags to have them participating.

#### Language Demands for Students E, F, G

If a student has no English skills, I will have most of their data worksheet in their native language and a list of key phrases.

If a student has some English skills but was not advanced, I will have some of their worksheet in their native language and English. Sentence stems would also be provided:

- “I found \_\_\_\_\_”
- “I noticed \_\_\_\_\_”

If a student has advanced English skills, I will have the key concept terms in their native language and in English. To help these students, sentence frames will be given:

- “I think \_\_\_\_\_ because \_\_\_\_\_”
- “I found \_\_\_\_\_ and think that happened because \_\_\_\_\_”

#### **LIST OF MATERIALS (PER GROUP):**

- 1) Material to use for activity
- 2) Thermometers (SERC has some available for check-out)
- 3) Blankets
- 4) Worksheets (2 different ones)
- 5) Clipboards to write on

#### **References**

Mattison, C. (2007). *The New Encyclopedia of SNAKES*. Princeton: Princeton University Press.

Roberts, A. (2010). *The Complete Human Body: The definitive Visual Guide*. London: DK.