THE ENVIRONMENT OF A LIZARD

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

GRADE LEVEL: This lesson is designed for a Grade Four science classroom. Grade Four students can be assumed to be able to learn about Life Science in reference to organisms and their need for energy and matter to live and grow. They should be able to identify various living conditions within environments, understanding that depending on unique physical abilities and adaptations, they can withstand or not, certain forces of nature. Students should be able to understand detailed information as far as characteristic traits and should be able to identify basic functions of a lizard in terms of how they relate to survival within their specific environment.

SCIENCE CONCEPT (the Main Idea): This lesson is aimed at helping students understand the type of environments that lizards can survive in and how they are able to utilize their own physical abilities to compliment this. This lesson also helps students to work cooperatively in groups to confirm that qualities like being ectothermic, help lizards to survive in various environments. We will specifically study a Sagebrush Lizard, focusing on habitat and diet, for this lesson.

RELATIONSHIP TO CALIFORNIA SCIENCE CONTENT STANDARDS:

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

    b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

    f. Follow a set of written instructions for a scientific investigation.

LEARNING OBJECTIVE:

1. Students will confirm that lizards are ectothermic and that they are capable of adapting to various environments.

EVALUATION IDEAS:

1. Formative: Students will fill out the Reading Comprehension sheet individually after listening to the book, Lizards read aloud.

2. Summative: Each student from each group will share out one result of the experiment that confirms that lizards are adaptable to various environments and that they are ectothermic.

CONCEPTUAL BACKGROUND:

A small, manmade habitat for a Sagebrush Lizard can be made with a small plastic aquarium and various items such as rocks, sand and branches. A teacher needs to know that a lizard can thrive

in a manmade habitat as long as it is made using items that can be found within its natural environment. There needs to be a general understanding of the term ectothermic, which is as follows: having body temperature that varies with the environment (princeton.edu). Species which are ectothermic – which fall mainly within the reptile classification – possess the ability to alter their own temperature depending on the need to either increase or decrease their own body heat. This ability allows lizards specifically, to become comfortable wherever they may live and continue to possess the capabilities to survive.

A manmade habitat can be sustainable for a lizard with careful consideration of placement of objects (within the specified area), opportunities for a lizard to prove they are ectothermic and a suitable supply of food and water.

LESSON IMPLEMENTATION PLAN: This lesson is designed as a group inquiry for groups of three students. Each student will be responsible for a specific ingredient of the manmade habitat.

ENGAGE – I will show pictures of various environments of lizards while explaining to students that they are all suitable providing at a minimum, one reason why. I will then read the book Lizards, by Trudi Trueit and students will complete the Reading Comprehension worksheet individually after. We will go over each answer of the worksheet together as a class, emphasizing Number 4, and explain that we are about to explore the possibilities behind this term ("ectothermic"). I will ask students, "How exactly could we confirm that lizards are ectothermic? What would we have to do in order to see them exercise their ability to adapt to various temperatures?" After briefly listening to several answers and possibly elaborating on them if necessary, I will allow students to create their own manmade habitats for lizards using a set of directions to see how the term "ectothermic" is applicable in real-life contexts.

EXPLORE – Each group of three students will build a habitat for a lizards according to the directions below. Upon completion, each group will either place their habitat directly under the sun or amongst the bushes in the shade, outside of our classroom. They will then have 30 minutes to "test" their lizard's capability of being ectothermic. I will monitor the experiment of each group of students by walking around and visiting them. I will ask questions such as, "What is the lizard doing to show us that he or she is adapting to the temperature that it currently is? How do we know this?" I will also ask, "What would we have to change of this lizard's environment specifically so that we can see him or her attempt to either become warmer or colder?"

EXPLAIN – Once the students have had the opportunity to observe their lizard in the first location specifically designated for their lizard, each group will record three observations on their Build a Habitat worksheet. They will then move their habitat to the other location (i.e. if the first and third groups originally placed their habitats under the sun they will then move to the shade; if the second and fourth groups originally placed their habitats in the shade they will move them to sit under the sun). After the moving of habitats to the second location, students will observe again for another 15 minutes and record three new observations (which show the term "ectothermic" being acted upon) under the second part of the worksheet.

ELABORATE – I will elaborate on the learning of the term “ectothermic” in regards to it being an ingredient for animal survival within an environment by showing students a display of ants fleeing from a “flood” (i.e. a stream of water) that I will create within a box prior to this lesson. The goal of this example is to show students that other animals, such as ants, possess the sense and ability to react to conditions present within their environment and make choices that are survival-oriented.

EVALUATE –

1. Formative: Students will follow the directions on the Build a Habitat worksheet to show that they are capable of following a set of written directions for a scientific experiment (Science Content Standards for California).

2. Summative: Students will share out after observing their lizards in each of the two locations reasons why they are ectothermic.

DIFFERENTIATION PLANS:

Behavioral for Student A

I will place this particular student at the front of the classroom for our introduction to the lesson as to ensure that he or she will remain on task. If this student becomes distracted or begins to become a distraction for others through his or her behavior I will be able to guide him or her back to the task, due to the position of him or her being at the front of the room. During the activity portion of the lesson, I will place this student in a group that will have atleast one student who has demonstrated consistent on-task behavior in the hopes that Student A will be influenced and remain on task as much as possible. I will monitor the behavior that takes place.

Cognitive for Student B

In order to assist this student with a different type of learning preference / ability such as the use of visual aids (if they have a hearing impairment), I will place him or her within the front row of the classroom so that he or she can see the pictures that I use in our introduction very clearly as well as hear the directions for the activity portion of the lesson explicitly. If this student requires more visual aids, this will help him or her. I will also ask him or her which particular parts of the manmade habitat benefit the lizard in which ways so that this student can exercise their ability to draw direct, visual connections to the lesson.

Cognitive for Student C

If this student exhibits inattentive behavior, I will monitor this student by placing him or her at a desk which is somewhat apart from the other desks in the introduction to our lesson. I will periodically check for understanding with this student as he or she might require more direct interaction with the teacher in order to learn, internalize and retain information. During our group activity, I will place this student specifically with atleast one other student who tends to be more focused so that the indirect influence could possibly help. I could also place this student with a pair of students that I know will work well with each other in the hopes that the immediate cooperation of the rest of the group will help this particular student remain on task and directly participate.

Affective for Student D

Affect is described as “the fuel that students bring to the classroom (cast.org).” It is generally supported by the consistent presence of motivation. In order to help this student who might lack a sense of drive or adaptability to his or her learning environment, I would make sure to interact with him or her throughout the lesson. I would do this by asking questions such as, “If you were to be considered “ectothermic,” what decisions would you make if you were placed in a cold environment? What about a hot one? Do you think being “ectothermic” helps lizards overall survive better in their own environments?” I think asking questions such as these would serve to keep the student interested and also allow him or her to feel valued for the input that is shared.

Language Demands for Students E, F, G

In helping these three EL students succeed in this lesson, I would place them together in a group so that I can utilize several different techniques and check for understanding unanimously. One technique that I would implement in this lesson is “thumbs up/thumbs down.” Since these three students will be sitting together, I can ask them periodically to show me a thumbs up or a thumbs down if they understand what I am saying or asking. This would allow me to either re-teach or go more in depth on a particular part of the lesson after I receive their feedback. Another technique that I would implement in this lesson is a Key Term vocabulary sheet. Dependent upon the first languages of these three students, I could create a sheet that shows particular terms that we use within this lesson (ectothermic, habitat, hot and cold) with pictures and then produce the terms (with their visuals) that would be equivalent in their first languages. This could serve as a way to sort of embed the new vocabulary into their minds and help them to draw connections that will hopefully last long.

LIST OF MATERIALS (PER GROUP):

- shoe box
- leaves
- branches
- sand
- rocks
- paper
- glue
- ants

DIRECTIONS FOR MAKING THE MANMADE HABITAT:

1. Gather the items that you have selected for your habitat from outside of the classroom.
2. Place the items for your habitat into the shoe box.
3. Arrange them however your group prefers, keeping in mind that you will be testing the ability of your lizard to control their body temperature by moving to various locations within the shoe box.
4. Place your lizard into the shoe box.

SUGGESTED READINGS:

Moenich, D. (1995). *Lizards.* New Jersey: T. F. H. Publications, Inc.

This book provides information on lizards about topics such as environmental preferences, nutrition and health, and breeding. Written on a fairly in-depth level, one can learn about different types of lizards and the climate that they prefer to live in. You can also learn about different physical traits like skin, color and eyes. It talks about compatibility with other domesticated pets and what type of interactions to expect. Overall, this book provides lots of information on a pretty detailed level.

Trueit, T. (2003). *A true book lizards.* New York: Children's Press.

This book covers a multitude of topics about lizards, some of which are the type of environment they prefer, senses that they possess and physical abilities. It shares a wide range of information that allows the reader to grasp a well-rounded perspective of the creature and how it survives in the world. The book also covers specific types of lizards like the Chameleon and talks briefly about geckos, a very similar reptile to the lizard but slightly different in appearance and ability. It also shares information on geographic regions that lizards can be found in providing a global perspective.