

A LIZARD'S ECOSYSTEM

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 regards to the food chain and its specific components. They should be able to identify the different categories that make up the food chain as well as understand that certain characteristic traits that fall within each category help them to rely upon one another for survival and adaptation. Students should be able to grasp the general flow of the food chain understanding that each category serves a purpose and order is necessary for nature's existence, is vital for continual growth, and survival.

SCIENCE CONCEPT (the Main Idea): This lesson is aimed at helping students understand how the lizard as a species fits within its category of Secondary Consumer in the food chain through its personality traits, physical characteristics and diet. This lesson also helps students to work cooperatively in groups through a guided experiment so that they can see how lizards fit within the category of Secondary Consumer and how well they survive when presented with the necessary and unnecessary components of their specific habitat.

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:

- a. Students know ecosystems can be characterized by their living and nonliving components.
- c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

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:

- d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.

LEARNING OBJECTIVE:

1. Students will document how lizards survive as Secondary Consumers – consuming various food and materials – on a worksheet.

EVALUATION IDEAS:

1. Formative: Students will fill out the Food Chain worksheet together as a class by drawing in the directionally-appropriate arrows and listing three characteristics of Secondary Consumers.
2. Summative: Each student from each group will share out one result of the experiment that guides us to an understanding of the role of a lizard as a Secondary Consumer in the food chain.

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 the role of a Secondary Consumer within the food chain and characteristics of such. There needs to be a knowledge base of what a lizard's diet consists of and what kinds of items help and hinder their abilities to survive and thrive. General roles of a Secondary Consumer must be known in order to draw valid connections between this role and the lizard, understanding certain dependencies upon plants and animals need to exist in order for a species within this role to function adequately. A sustainable habitat for a lizard can be created with careful placement of proper food and objects.

LESSON IMPLEMENTATION PLAN: This lesson is designed as a guided inquiry for groups of three to four students. Each student will be responsible for helping to create the proper "ingredients" for a suitable lizard living environment.

ENGAGE – I will show a diagram of the food chain to students. We will go over specific terms associated with it such as "primary consumer, secondary consumer and tertiary consumer." I will explain that all of these are necessary components for the survival of various species. I will then show student pictures of each category within the food chain (i.e. primary consumer, secondary consumer, etc.) and ask, "Why do you think this species fits within this category? What characteristic traits does it possess that allows for it to be placed within this category?" After suitable time for discussion of these questions, students will fill out their Food Chain worksheets by filling in the arrows pointing in the appropriate directions and then writing three characteristics of a Secondary Consumer (because a lizard falls within that category). After briefly reviewing the worksheet and going over any difficulties that students might be having with any particular category, we will use our manmade habitats that we built in our lesson, "The Environment of a Lizard" to figure out a recipe to test our lizards' capabilities as Secondary Consumers.

EXPLORE – Each group of three to four students will arrange specific items (rocks, branches, etc.) and food according to how they think their lizard will either thrive or not in their specific environment. Upon completion, each group will observe their habitat for 20 minutes to see whether or not their lizard is doing well or lacking the necessities to survive sufficiently. After this period of observation has passed, if students had arranged their objects with a goal targeted towards testing an insufficient environment then they will rearrange their objects in an attempt to create an environment that their lizard would do well in. They will observe again for another 20 minutes. I will monitor the experiments of each group of students by walking around and visiting them. I will ask questions such as, "How have you arranged your items in order to test how your lizard – as a Secondary Consumer – would thrive in your habitat? What kinds of food have you provided? What have you done in order to test to see if your lizard would not survive as a Secondary Consumer?"

EXPLAIN – Once the students have had the opportunity to observe their lizard as a Secondary Consumer in various environments, each group will record their observations on their Food Chain Experiment worksheet under the appropriate subtitles: "What do lizards eat? What do lizards not eat? How will we test how a lizard fulfills its role as a secondary consumer within the

food chain?” In completing this worksheet, students will be internalizing the processes that they used (the habitats that they arranged) in order to create the necessary results for a Secondary Consumer to thrive – or not.

ELABORATE – I will elaborate on the learning of the various terms of the food chain by showing more examples of different species that fit within each category (primary consumer, secondary consumer, tertiary consumer, etc.) and explain why. I will also demonstrate why specifically that certain items of food will not help lizards to survive by placing that particular piece of food in the habitat and observing, with the class, it not being eaten. I think showing specific examples like these would prove to show students exactly what Secondary Consumers in the food chain do and do not eat, clarifying any misconceptions that they might have.

EVALUATE –

1. **Formative:** Students will create their own “recipe” given a variety of ingredients to choose from in which they will demonstrate how and why lizards are considered Secondary Consumers.
2. **Summative:** I will grade students’ individual A Food Chain Experiment worksheets based on whether or not each bullet point was filled in (correctly) and Ideas One and Two contained information relevant to the lesson being taught.

DIFFERENTIATION PLANS:

Behavioral for Student A

I will place this student near the front of the room for our introduction to the lesson so that he or she has the best opportunity as possible to stay focused. During the activity portion of the lesson, I will place this student in a group that will have at least one student who generally remains on task so that he or she could help this particular student, in both direct and indirect ways, in modeling appropriate behavior. I will monitor these interactions that take place. If this student becomes off task and disrupts other students from learning, I will be able to offer him or her alternatives to stay on task for the remainder of the lesson.

Cognitive for Student B

In order to help this student with possibly different types of learning preferences, I will designate a spot for him or her to sit near my desk so that he or she can actively participate easier seeing all of the learning materials up close. Being positioned near my desk, it might be easier for this student to hear me speak and also to ask for assistance as I could get various materials that he or she might need, easier. If this student requires more visual aids, I could easily provide them to him or her as well.

Cognitive for Student C

If this student exhibits inattentive behavior, I will monitor this student by placing him or her at a desk that is somewhat apart from the other desks. I will initiate this at the beginning of the lesson so that this student has the best chance possible for succeeding despite his or her lack of attention span. I will periodically check for understanding with this student as he or she might require more frequent socialization in order for him or to stay on task and focused. During our group activity, I will place this student specifically with at least one other student who tends to be more

focused so that the distractible student may have a better chance of staying on task. In past experiences I've noticed that the concept and application of proximity helps students focus better.

Affective for Student D

Affect is described as “the fuel that students bring to the classroom (cast.org).” I would ensure subtle but consistent interaction with him or her so that he or she feels validated as a learner in turn, helping him or continue to put forth their best effort. I would ask questions such as, “Could you give me an example of an animal that you think might fit within the category of Primary Consumer? What about an animal that closely resembles a lizard that also might fit within the category of Secondary Consumer? What might we do in order to test this?” These questions might drive this student to begin to think independently and give them a head start in thinking about how they might want to create their experiment with the provided ingredients.

Language Demands for Students E, F, G

In order to help these three EL students succeed in this lesson on identifying appropriate environments for a lizard as a Secondary Consumer, I would implement a series of different methods. First, I would check for periodic understanding on an informal basis by asking these students to hold up one finger if they understand a concept like Primary Consumer. If they do not, then I would know that I should begin to think of different ways to approach teaching this concept. This would be an easy formative assessment that I could use throughout the lesson. Second, I would ask these students on an individual basis to show me the various materials that they use in their habitat to test their lizard as a Secondary Consumer, and ask them to name them as well. This way I could see directly if they have acquired the vocabulary knowledge that I have attempted to teach. Third, I would group these students together so that they can feel secure in their attempts at learning a second language. I would hope that in sharing this experience they could help each other by providing positive reinforcement and feedback. I think this might be very useful again, with the acquiring of vocabulary.

LIST OF MATERIALS (PER GROUP):

- manmade habitat
- leaves
- branches
- rocks
- berries
- insects
- cheese
- bread
- rice
- water

SUGGESTED READINGS:

Collard, S. (2012). *Lizards*. Massachusetts: Charlesbridge.

This book talks about a lizard's habitat, natural demeanor, home environment and domestication. It talks avidly about having lizards as pets and how careful observing of them will help you to get to know them well. The book talks about the most popular of lizards, the iguana and monitor, and how they compare to other types of lizards. After reading this book, you will learn about the lifespan of a lizard, how to catch one in the wild, and how are not advised to release a pet lizard (that you purchased from a store) into the wild for a variety of reasons. This book provides great general information on lizards as well as some specific areas of importance.

Kalman, B. (1998). *What are food chains and food webs?* New York: Crabtree Publishing Company.

This book explains various aspects of food chains, including vocabulary and discussion of ecological communities. Detailed photographs and charts help to further the information, providing a well-rounded knowledge base consisting of lots of valuable material. Targeted for an audience ages 7 and up, this book is suitable for this fourth grade lesson on food chains. Some of the photographs also show mating and births, allowing students to see the different aspects/events that surround the process of life. It also helps students to see up close the characteristic traits that allow for classification of Primary Consumer, Secondary Consumer and Tertiary Consumer to take place.