

# Science Lesson Planning Template

## Context Issues of the Lesson

<b>Unit or Lesson Title:</b>	Animal Adaptation
<b>Grade Level</b>	3 <sup>rd</sup> – 5 <sup>th</sup>
<b>Topic/Theme/Nature of the Investigation:</b>	Discovering Animal Adaptation
<b>NGSS Performance Expectation(s)</b>	3-LS4-4 <ul style="list-style-type: none"> <li>Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there change.</li> </ul>
<b>NGSS Dimension 1 component</b>	Engaging in Argumentation from Evidence <ul style="list-style-type: none"> <li>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.</li> </ul>
<b>NGSS Dimension 2 component</b>	<ul style="list-style-type: none"> <li>LS2.C: Ecosystem Dynamics, Functioning, and Resilience.</li> <li>LS4.D: Biodiversity and Humans <a href="#">This is the one</a></li> </ul>
<b>NGSS Dimension 3 component</b>	System and System Models <ul style="list-style-type: none"> <li>A system can be described in terms of its components and their interactions.</li> </ul>
<b>Duration:</b>	Two 50 minute class periods

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## Planning Stages Within the 5-E Inquiry Model

<b>Engage</b>															
<b>PURPOSE:</b> <ul style="list-style-type: none"> <li>to convey the context of the lesson(s)/unit by conveying an important Key Question</li> </ul>															
<b>What is the teacher doing? What are the students doing?</b>															
<ul style="list-style-type: none"> <li>Ask the students “What are some animals with certain physical features that help them survive in their environment?” As the students mention specific examples, write them on the white board in the front of the room.</li> <li>The students may include things like camouflage, defense features, or features that allow the animal to collect and eat their food.</li> <li>If the students are struggling to find examples, the following is a list that can spark more ideas:                             <table style="margin-left: 40px; width: 80%; border: none;"> <tr> <td style="padding: 2px;">Elephant – trunk</td> <td style="padding: 2px;">Shark – sense of smell</td> </tr> <tr> <td style="padding: 2px;">Giraffe – neck</td> <td style="padding: 2px;">Hunting dogs – ears</td> </tr> <tr> <td style="padding: 2px;">Echidna – spines</td> <td style="padding: 2px;">Lion – color, claws</td> </tr> <tr> <td style="padding: 2px;">Gecko – fake tail</td> <td style="padding: 2px;">Polar bear – coat, color, claws</td> </tr> <tr> <td style="padding: 2px;">Kangaroo – hind legs</td> <td style="padding: 2px;">Skunk – smell</td> </tr> <tr> <td style="padding: 2px;">Goat – surefootedness</td> <td style="padding: 2px;">Zebra – what happened there?</td> </tr> <tr> <td style="padding: 2px;">Snakes - Bright colors indicating poisonous</td> <td style="padding: 2px;">Sloth – can be man-made</td> </tr> </table> </li> <li>Reference for this information: <a href="http://lessonplanspage.com/scienceanimaladaptations58-htm/">http://lessonplanspage.com/scienceanimaladaptations58-htm/</a></li> </ul>		Elephant – trunk	Shark – sense of smell	Giraffe – neck	Hunting dogs – ears	Echidna – spines	Lion – color, claws	Gecko – fake tail	Polar bear – coat, color, claws	Kangaroo – hind legs	Skunk – smell	Goat – surefootedness	Zebra – what happened there?	Snakes - Bright colors indicating poisonous	Sloth – can be man-made
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<b>Explore</b>															
<b>PURPOSE:</b> <ul style="list-style-type: none"> <li>To test ideas and develop knowledge using explorations, investigations, experiments on Animal Adaptation.</li> </ul>															
<b>Activities (list)</b>	<b>Driving Question</b>														
<ul style="list-style-type: none"> <li>Each group of students will pick an animal from a bag and then pick up the informational resources about their animal or conduct research of their own in the computer lab. The animals will include beavers, owls, frogs, blue herons, chameleons, armadillos, tigers, bears, and snakes.</li> <li>The groups will find information and report on the ways that their animal has adapted to its environment.</li> <li>The students will record their investigations of the animal and its adaptations in their science notebooks.</li> <li>Example questions that may be given to students to investigate:                             <ul style="list-style-type: none"> <li>What special adaptations does the animal have to help it succeed in its environment?</li> <li>Are the adaptations a physical part of the animal?</li> <li>Are the adaptations a behavior that the animal uses?</li> <li>If the animal didn't have the adaptations, what problems would it face?</li> <li>What other animals have similar adaptations in your animal's environment?</li> </ul> </li> <li>The groups will report their data collected from the investigation to the whole class.</li> </ul>	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;">                     How do animals use adaptation to survive in their environment?                 </div>														

**Student Communication Product:** (written report, oral presentation, poster, etc.)

- Working with a partner, the students will create a poster that will include a drawing of their animal, all of the facts collected about the animal, and the animal's adaptations on the poster.
- Each group will present their poster to the class and then answer questions from the class about their animal and its adaptations.

(consider showing "Models" of student products to help student identify characteristics of quality)

### **Explain**

**PURPOSE:**

- to answer the Key Question through student explanations
- to provide students with relevant vocabulary, formal definitions and explanations of concepts

**Content Media: (written material, video, teacher lecture, technology)**

- The students will watch the video Animal Life in Action: Animal Adaptation by Schlessinger Media.
- Reading to a partner, the students will read information on Birds Adaptations. As they read the information, the students will discuss and share their thoughts with their reading partner.

**Student Communication Product (assessment):** (unit test, written report, oral presentation, poster, etc.)

- In their science notebook, the students will name and find the purpose of the adaptation of four animals. The students will be given pictures of four animals and the adaptation for that particular animal. For example: A picture of a fox that has had a color change in its fur for the winter season.

### **Elaborate**

**PURPOSE:** [Very Creative!!](#)

- to extend students' conceptual understanding through application or practice in new settings

### Activities:

- Animals gain and adapt their physical features over millions of years, but our task today is going to cut down that time just a little – you are going to design an animal which is perfectly suited to its environment.
- Background Information: It is the future, the year 3000, and it is now possible for humans to build planets, and genetically engineer or create plants and animals to live on that planet. You are one of the scientists working on the animals, and it is your job to design and create an animal which will be perfectly suited to its environment on this new planet.
- Task: You need to pick one of the following environments of already created planets and create an animal which is going to be strong and resilient enough to survive in that environment. You need to consider how this animal is going to stay warm or cool, what it is going to eat, how it is going to get its food and water, and how it is going to care for its young to make sure they survive. Your animal must FIT INTO the existing food chain – it cannot be the ultimate predator (the one which can eat everything else and nothing can eat it).

#### ENVIRONMENTS

Select 1 of the following:

1: This planet is dark and cold most of the time. It is very mountainous. It rains almost all day. Because of the wet, dark conditions, the only plants that grow well are small mosses and funguses. Animals on this planet include a type of mouse, a nocturnal hunting large cat, fish, and a variety of insects.

2: This planet is dry and hot. Most of the planet is flat. Water is found in underground streams but there is little water on the surface of the planet. Most of the planet's surface is covered in sand, although there are patches of dry grass. When plants can get their roots down into the water table, they grow into tall trees with leaves at the top but not along the trunk. Plants which are not connected to the water table are small and dry, but they are edible. Animals on this planet include insects, a species of birds which roost in the high trees, a sand-colored lizard and a type of rat.

3. This planet is tropical: wet and hot. Most of the planet is covered by rainforest. The planet is very flat. Water collects in large pools and lakes which have water in them all year 'round. A species of poisonous plant grows thickly on the ground. The spines of this plant are poisonous, and any animal which steps on one is sure to die. The vegetation is plentiful, and includes leaves, fruits and nuts. Animals include carnivorous snakes, varieties of insects, monkeys, fish and birds.

4. This planet has a moderate climate. It never gets very hot or very cold, but stays mild all year 'round. It rains for part of the year and the water forms pools and lakes which dry up towards the end of the year and then the planet is very dry. The planet is partly mountainous and partly flat. Vegetation includes tall trees with high leaves and fruit, and a smaller plant which bears nuts. However, these nuts are inside hard shells which need to be removed before the nut can be eaten. Animals include rats and mice which live underground, insects, birds that nest in the tall trees, slow moving mammals which also live in the trees and a species of carnivorous nocturnal wolf.

- When you are designing your animal consider the following:
  - Size
  - What does it eat?
  - How will it catch/get food and water?
  - How will it keep warm/cool
  - Where will it shelter?
  - How will it protect/defend itself from attackers?

In the rest of the space, which should be almost a page, you need to draw a labeled picture of your creature. Give your animal a name and congratulations! You've created a new animal!

- **Reference for this activity:**

<http://lessonplanspage.com/scienceanimaladaptations58-htm/>

**Content Media: (written material, video, teacher lecture, technology)**

- The students will use the information about the new environment from the activity to help them create the new animal. They will need to consider every aspect of the new environment to make sure that their animal will survive.

**Extending/Application Questions for Whole/Small Group Discourse:**

- Why is it important for animals and humans to have the ability to adapt to changes in the environment?
- Why is adaptation critical for an animal's survival?
- How do animals adapt to their environments through certain behaviors or actions?

**Student Communication Product (assessment):** (unit test, written report, oral presentation, poster, etc.)

Using a rubric, assess the students on the Animal Adaptation Project.

- Has the student fulfilled all parts of the task?
- Has the student chosen features which allow the animal to survive in this environment?
- Is it neatly presented and labeled?

**Evaluate**

**PURPOSE:**

- for students to assess their understand of the learning objectives
- for the teacher to assess student understanding of the learning objectives

**Skill/Reasoning Learning Objectives**

- Make a claim about the merit (evaluation?) of a solution (adaptation, in your lesson?) to a problem caused when the environment changes(4 new environments, in your lesson?) and the types of plants and animals that live there change (create a new animal, in your lesson)?.
- Do the 4 environments you give the students represent the environmental

**Assessment Instrument**

- Using a rubric, assess the students on the Animal Adaptation Project.
- Has the student fulfilled all parts of the task?
  - Has the student chosen features which allow the animal to survive in this environment?
  - Is it neatly presented and labeled?

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<b>Knowledge Learning Objectives</b>	<b>Assessment Instrument</b>
<ul style="list-style-type: none"> <li>• Animal's ability to adapt to survive in their environment.</li> </ul>	<p>Using a rubric, assess the students on the Animal Adaptation Project.</p> <ul style="list-style-type: none"> <li>• Has the student fulfilled all parts of the task?</li> <li>• Has the student chosen features which allow the animal to survive in this environment?</li> <li>• Is it neatly presented and labeled?</li> </ul>