

# **A Hands-on Guide to Native Animals in an Ahupua'a**

**Developed by:  
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**Grade Level:** First Grade

**Purpose:** This curriculum is designed to communicate:

- I. Students learn that ahupua'a is a management system and also an animal habitat.
- II. Students learn the importance of the intact habitat for Hawaii's native animals.
- III. Students explore ahupua'a and discover some of the native animals (gobies, happy face spiders, hoary bats, and honeycreepers) in Hawaii.

## **Hawaii Content and Performance Standards (HCPSIII):**

Standard 1: The Scientific Process: Scientific Investigation: Discover, invent, and investigate using the skills necessary to engage in the scientific process.

### Benchmarks

- SC.1.1.1. Collect, record, and organize data using simple tools, equipment, and techniques safely
- SC.1.1.2. Explain the results of an investigation to an audience using simple data organizers (e.g. charts, graphs, pictures)

Standard 2: The Scientific Process: Nature of Science: Understand that science, technology, and society are interrelated.

### Benchmark

- SC.1.2.2 Describe a variety of changes that occur in nature

Standard 3: Life and Environmental Sciences: Organisms And The Environment: Understand the unity, diversity, and interrelationships of organisms, including their relationship to cycles of matter and energy in the environment.

### Benchmark

- SC.1.3.1. Identify the requirements of plants and animals to survive (e.g. food, air, light, water)

Standard 4: Life and Environmental Sciences: Structure And Function In Organisms: Understand the structures and functions of living organisms and how organisms can be compared scientifically.

Benchmark

SC.1.4.1 Describe how living things have structures that help them to survive

Standard 5: Life and Environmental Sciences: Diversity, Genetics, And Evolution: Understand genetics and biological evolution and their impact on the unity and diversity of organisms.

Benchmark

SC.1.5.2 Describe the physical characteristics of living things that enable them to live in their environment

**Topic and Driving Question:**

How does the ahupua'a system promote a diverse habitat for Hawaii's native animals?

**Rationale:**

Ahupua'a refers to the traditional land division in Hawaii. It provides a habitat for many native animals by supporting a diverse environment that includes the mountains, the valleys, and the sea. In this curriculum students will learn the basic natural history of some native animals in Hawaii and how they are unique to their habitat. Through hands-on, inquiry-based activities, students comprehend the importance of preserving diversity of the native animals in Hawaii.

**Concept Map for Unit:** See attached sheet

**Formative Assessment:**

Students will demonstrate continued learning throughout the unit through successful completion of class projects, activity specific worksheets, discussions of the main concepts, and daily written explanations or drawings of what they did, saw, and learned for each activity.

**Overview of Lessons Chart:** See attached sheet

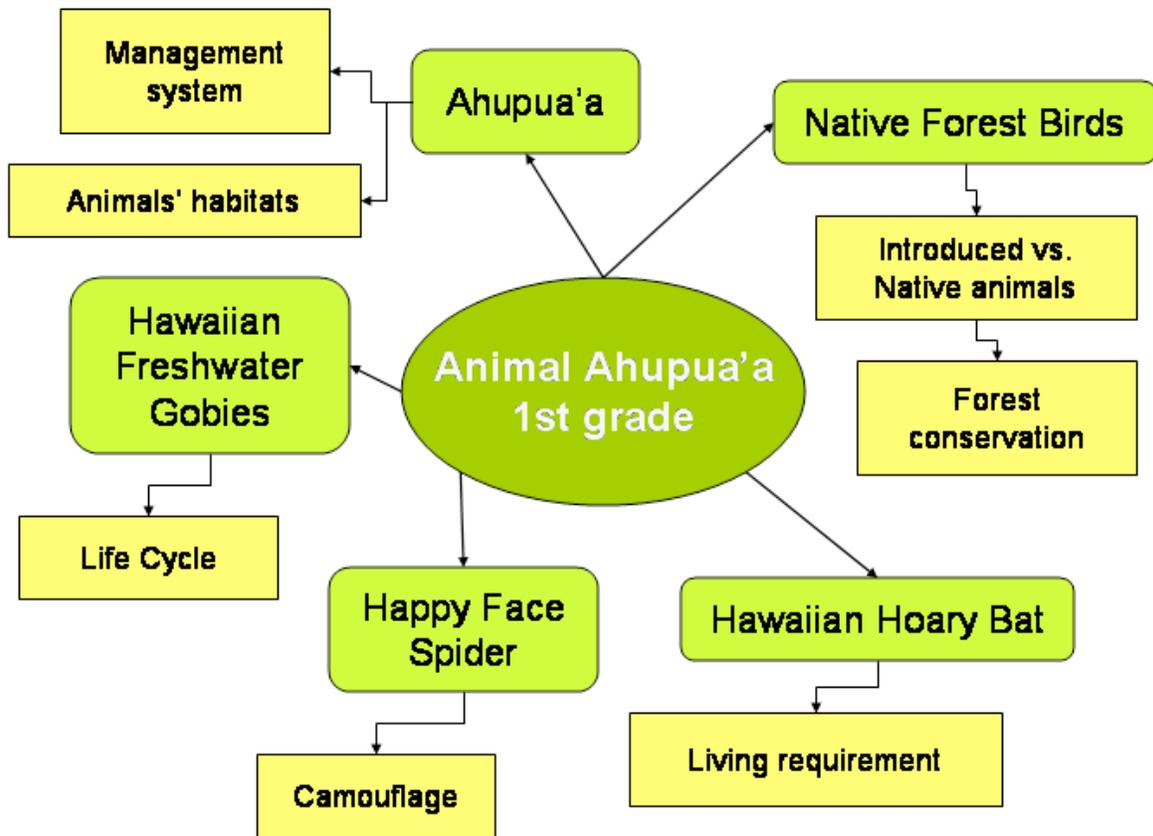
**Sources:**

PRISM

Ohia Project

Bat Conservation International ([www.batcon.org/](http://www.batcon.org/))  
TERRA (<http://en.terra.com/>)  
ARKIVE ([www.arkive.org](http://www.arkive.org))

## Unit Concept Map



<b>Timeline</b>	<b>Lesson and Topic</b>	<b>Concepts</b>	<b>Student Objectives</b>	<b>Activity description</b>	<b>Assessment</b>
<i>Lesson 1</i> <i>1 hour</i>	What is an Ahupua'a?	Ahupua'a refers to the old Hawai'i land dividing system that contains all types of ecosystems.	In this introduction to an ahupua'a, students learn how the land was divided under traditional Hawaiian system. They also start to look at the ahupua'a as a unit that contains different types of ecosystems.	Students go through an exercise where they divide an island using their own designs. They pair up and compare designs with each other. Finally, students are introduced to the traditional Hawaiian ahupua'a system where the island is divided along the watersheds to include all ecosystems.	Discussion on ahupua'a Ahupua'a worksheets
<i>Lesson 2</i> <i>1 hour</i>	O'opu Life Cycle	Life cycle Physical transformation	<ul style="list-style-type: none"> <li>Students will learn the life stages and the amphidromous (partly sea and partly freshwater) life cycle of 'o'opu by enacting them through an obstacle course.</li> <li>Students will be able to describe the cyclic nature of reproduction, and how a complete habitat plays an important role for species conservation.</li> </ul>	In this lesson, students act as 'o'opu (Hawaiian gobies) at different stages of life. An obstacle course begins at the egg stage and students make their way through each step (i.e. larvae, post-larvae, juveniles, adults, etc.), from the ocean to a freshwater stream. Each stage uses a different mode of locomotion, which students enact. Props are used to represent their food resources and eggs.	Class discussion after the game Completion of the life cycle wheel (see extension activity)
<i>Lesson 3</i> <i>1 hour</i>	'Ōpe'ape'a (Part I: virtual tour)	Characteristics of mammals Echolocation in bats Structures and functions in Hawaiian hoary bats	<ul style="list-style-type: none"> <li>Students will be able to explain basic characteristics of mammals and how the Hawaiian hoary bats were mammals.</li> <li>Students will develop observational skills and practice working with each other during a virtual exploration.</li> <li>Students will study the physical structures of Hawaiian hoary bat through arts &amp; crafts.</li> </ul>	Students will learn about Hawaiian hoary bats through a virtual exploration activity and a group discussion. They will learn the life history of bats and speculate the functions of echolocation through discussion and watching video footage. At the end of the lesson, students will discuss what they learn as a class.  In the extension activities, students make their own bat puppets and learn the physical structures of Hawaiian hoary bat.	Worksheets completed Discussions on bats Making Hawaiian hoary bat puppets

<i>Lesson 4</i> <i>1 hour</i>	‘Ōpe’ape’a (Part II: games on echolocation)	Echolocation	<ul style="list-style-type: none"> <li>• Students will participate in games and work as a group.</li> <li>• Students will be able to explain how Hawaiian Hoary bats use echo to find preys.</li> </ul>	Students will play games to simulate echolocation in Hawaiian hoary bats. After the games, students will discuss what they learned as a class.	Participation in games. Participation in discussion session.
<i>Lesson 5</i> <i>1 hour</i>	Happy Face Spider	Camouflage	<ul style="list-style-type: none"> <li>• Students will be able to describe natural history facts about the happy face spider.</li> <li>• Students will be able to explain how this spider camouflages itself with the patterns on the body.</li> </ul>	Students create their own paper cutouts of the happy face spider. They place the spider on leaves with different colors, and discuss the functions of the “happy face” patterns on their spiders.	Students discuss their ideas with partners and as a class. Models of happy face spider and leaf completed.
<i>Lesson 6&amp;7</i> <i>2 (1 hour) sessions</i>	Protecting Our Native Forests	Native animals Introduced animals Habitat conservation	<ul style="list-style-type: none"> <li>• Students will work as a team and each contributes to complete the project of a short film or storybook.</li> <li>• Students will be able to show the purpose for conservation of native forest habitats using story telling.</li> </ul>	During the next two lesson periods, students will put together a short story on protecting Hawaii’s native forest. During the first activity, students will construct the characters and background scenes for the story. The teacher will put together the final products to make a storybook or turn it into a short film. During the second activity, students will read the storybook or watch the movie and discuss the importance of conserving native habitats.	Discussion on conserving the native forest. Movie or storybook completed.
<i>Lesson 8</i> <i>1 (2-3 hour) session</i>	Field Trip	N/A	Students will see some of the native animals and their habitats that they learn during the previous lessons	Students will go on an excursion to a nearby forest reserve, national park, museum, or zoo.	None