**Observation Lab**

**Summary**
In this lab, students develop their observational skills by carefully examining the physical appearance and behavior of fresh and brackish water organisms that can be found in their own backyard.

**Objectives**
- Students will learn how to make careful scientific observations
- Students will learn to apply what they learn about in the classroom to their natural surroundings

**Materials**
- 1 “Backyard Scientist” worksheet per students.
- In addition, each classroom needs the following:
  Per organism station:
  - 1 beaker
  - 1 airstone (with tubes and pump. See Teacher Prep)
  - 1 organism
  Per microscope station:
  - 1 microscope
  - 1 microscope slide

**Making Connections**
This activity is designed to extend or renew the students’ interest in aquatic organisms by bringing some into the classroom for observation, thereby providing a grounding to the more theoretical activities and exercises.

**Teacher Prep for Activity**
The most difficult part of this lab is collecting the necessary organisms. While this may seem daunting, almost all fresh and brackish water in Hawaii has something of interest in it, even if only a mosquito larvae. Particularly good areas for collecting organisms are shallow pools and the sides of streams. Take your time, look carefully, and maybe bring a swimsuit, a snorkel, and a net to go after some of the bigger stuff. Another option is to encourage students to bring in whatever they can collect, perhaps even making it into a game or competition. A surprising number of students explore the streams and rivers of Hawaii on their own time and may be a valuable resource for collecting organisms.
Some easily obtained species are:
- From pristine streams
  - Hihiwai, Pouch snails, Guppies, Dragonfly larvae, Damselfly Larvae, Tadpoles, ‘Opae kala’ole, Tahitian Prawns
- From polluted or altered streams
  - Craydads, Tahitian Prawns, Tadpoles, Guppies, Pouch snails
- From pools and puddles
  - Mosquito larvae, Tadpoles, Guppies, Pouch snails, Ramshorn snails
- From slow-moving altered portions of streams
  - Tilapia, O’opu akupa (occasional), Guppies, Pouch snails, Ramshorn snails, Mosquito larvae, various other invasive species
- From a pet store
  - ‘Opae’ula

Once in the classroom, most of these organisms can withstand a few hours or a day in a beaker but an air supply is highly recommended if they will be kept overnight. This is especially true with species that come from streams where the water oxygen levels are constantly high. All that is necessary to maintain sufficient oxygen levels is an airstone connected to a pump. These supplies, along with the necessary tubes and splitter values, can be purchased at any pet store. Each organism/beaker requires its own airstone but a single pump, with sufficient tubing and splitter values, should be sufficient for all the samples.

If microscopes are available, mud, algae, and even rocks contain a surprising amount of life. While it may be nearly impossible to identify these microorganisms, most students will be amazed by the diversity and abundance of life that can be found in something like mud.

Prior to the classroom activity, remove the airstones from the beakers and spread them around the classroom. Label each with the species name (when known). In addition, prepare microscope slides of collected mud, algae, or other “muck” and try to focus on some of the microorganisms that can be seen moving inside of them.

**Background**
No additional background is necessary.

**Procedure**
1) Discuss with the students how the things they have been studying are not just found in the classroom or in a textbook. A good introductory questions might be “Who’s been bitten by a mosquito? Where are they coming from and how do they get there?” (Mosquitoes lay their eggs in any available freshwater. The eggs hatch and the larvae are fully aquatic until they hatch into adult mosquitoes.)

2) Introduce the activity and briefly discuss how careful observations are the foundation of science.

3) Handout one “Backyard Scientist” worksheets per students. The attached documents can be modified to fit the number of collected specimens. Page 4 is the title page and is good for a single organism station. Page 5 is a generic observation sheet that is good for two organism stations. Page 6 is for microscope observations and is sufficient for two microscope stations.
4) Release the students to complete this lab. While this activity is self-directed, it may be worth calling the class’ attention to a particularly interesting organism or microscope slide. For example, dragonfly larvae, which can often be found in small puddles or eddies along the banks of streams, are charismatic hunters and will easily catch and consume any small fish or insect larvae put into their beaker.

Assessments
Completion of the “Backyard Scientists” worksheet.
Backyard Scientists

Name:

Date:

Period:

In this lab you will practice making careful and detailed observations. A number of stations have been set up around the classroom and at each is an aquatic organism that can be found in Hawaii. At each station, describe the organism, including size, color, shape, and anything else that you think is important. Take your time and BE SPECIFIC.

Species Name: ___________________________

Description: (What is the color? What is the shape? How big is it?)

Behavior: (What is it doing? How does it move? Where in the beaker is it found?)

Draw a Picture:
Species Name: ____________________________

Description: (What is the color? What is the shape? How big is it?)

Behavior: (What is it doing? How does it move? Where in the beaker is it found?)

Draw a Picture:

Species Name: ____________________________

Description: (What is the color? What is the shape? How big is it?)

Behavior: (What is it doing? How does it move? Where in the beaker is it found?)

Draw a Picture:
Microscope Station: _____________________________

Describe what you see through the microscope, including any “microorganisms” (small microscopic organisms). Describe and/or draw them below.

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