

Lesson 6: Stream Habitats and Biota

Lesson Context: In this lesson, students will learn about the animals that live in Hawaii's streams and their habitats, as a foundation for formulating hypotheses about the impact of stream restoration on habitat and biota.

Time Frame: 2 class periods

Objectives:

Student will be able to:

1. List the common native and introduced species of mollusks, crustaceans, fish and insects that inhabit Hawaii's streams and describe their special adaptations.
2. Identify the types of habitats that are available in Hawai'i streams and the preferred habitat of key native and introduced species.

Materials:

1. The "**Virtual Stream Study**" and "**Meet the Critters**" pages of the Stream Study Website.
2. A hat containing small pieces of paper, each with one of the scientific and common names of a **native species** of Hawaiian streams (there should be a total of 24 native species in the hat, from the "Meet the Critters" page).
3. A hat containing small pieces of paper, each with one of the scientific and common names of an **introduced species** of Hawaiian streams (there should be a total of 19 introduced species in the hat, from the "Meet the Critters" page).
4. Printed pages of species' profiles (selected by students; printed from the website).
5. Large species name cards.
6. One 8-1/2" x 11" sign for each of the following stream areas:
 - *Slow run*
 - *Medium-speed run*
 - *Fast run*
 - *Riffle*
 - *Waterfall/cascade*
 - *Deep pool*
 - *Calm, side pool*
 - *Wetted boulders and rocks*
 - *Headwaters*
 - *Mouth - near ocean*
 - *Vegetation on stream bank*
 - *Wetlands*
 - *Kalo lo'i*

Procedure:

PART ONE:

1. Ask the students to get in their teams (3). Ask each team to conduct the "**Virtual Stream Visit**" on the Stream Study website. Each team records answers on the **Stream Observation worksheet**.
2. Conduct a discussion about the concepts of "native" and "introduced" species, explaining the terms "indigenous" and "endemic".

PART TWO:

3. Each team member (except one – see below) picks a paper from the hat of a **native species**. (No two students should have the same species).
4. Ask the students to work in pairs. Each pair should go to the "**Meet the Critters**" page of the website and learn about their own and their partner's species. Each pair should also look up their two species in the book, "Hawaii's Native and Exotic Freshwater Animals" by Mike Yamamoto (copies sent to school).
5. One student on the team should also learn about the team's "mascot" species (the team name).
6. Ask the students to pretend that their class inhabits a "stream community" and are getting to know one another. Ask the students of each team to present all of the "species" in their team to the class by having each partner introduce the other.

When introducing the species to the class, they should include as much information from the species profiles as possible (e.g. species name, native or introduced, habitat, preferred area of stream, diet, predators, range, facts).

Be creative; use props and humor if possible.

7. Repeat the procedure with the **introduced species**.

PART TWO:

8. Ask each team to play a "Who Am I?" twenty questions-type game in their team:
 - Give each team large name cards for all of the species that their team presented (native and introduced) Ask them to shuffle the name cards. Each team member picks one card without reading it and tapes it to his/her back.
 - By asking questions of the his/her team members, each student tries to guess what species he/she is. (Note: Only "YES+NO" questions may be asked, and they may not ask, "Am I a crustacean?". Print out the species profiles for the students to look at).
 - All of the students in one team are trying to guess (and ask) at the same time. Teams are timed to compare how long it takes each team for all of its members to guess their species. The fastest team wins.

9. Ask students to create an imaginary stream in the classroom by positioning the stream area signs in logical places.
10. Ask each student to go to the place in the classroom where the species they had presented prefers to live. Have the "neighbors" in each habitat area meet one another and realize that they are interdependent.