

INTRODUCING....



Grade 2

Lesson at a Glance

Students piece together clues to learn more about introduced stream animals in Hawai'i.

Key Concept

Freshwater fishes, insects, prawns and frogs have been introduced to Hawaiian streams and wetlands. Some were brought in accidentally, others were intentionally introduced.

Objectives

Students will be able to:

- 1) Differentiate between native and introduced stream life.
- 2) Identify some of the stream animals introduced to Hawai'i.
- 3) Write statements about why some stream animals were introduced.
- 4) *mālama* (care for) the environment.

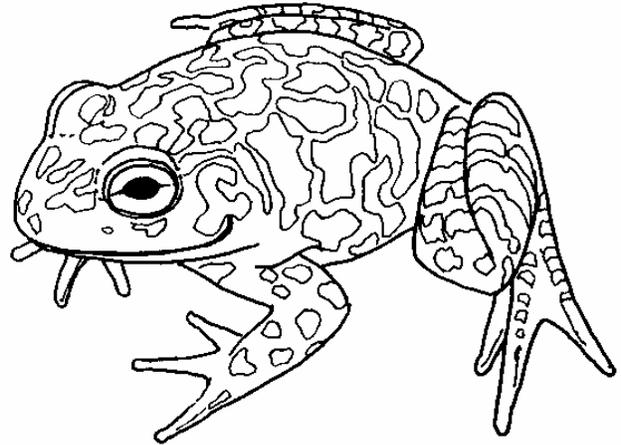
Time

One to two class periods

- **Social Studies/Geography,**

Environment and Society: The student:

1. identifies and labels the earth's resources within land, air, and water.
2. describes and explains how and why people use earth's resources to meet their needs.
3. describes how people change the environment for better or worse.
4. creates and implements a plan to sustain and preserve a neighboring marsh, field, stream, etc.



- **Science/Mālama i ka 'Āina, Conservation of Resources** Students make decisions needed to sustain life on Earth now and for future generations by considering the limited resources and fragile environmental conditions. Performance Indicator for Conservation of Resources:

1. Identifies our natural resources and describes ways in which they can be conserved.

Subject Areas

science, language arts, Hawaiian studies

Materials

animal cards (provided)
clue sheets (provided)
student activity sheet (provided)
briefcase or small suitcase

colored markers or crayons
scissors

Preparation

Copy and cut the animal cards, color the animals according to the directions on the student activity sheets, and laminate or glue them to oak tag. Place them in a briefcase or suitcase.

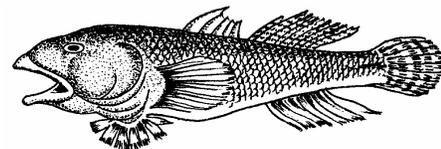
Prerequisite

“Waterfall Wizard” or “Damsels and Dragons,” Plants and Animals, Grade 2

Teacher Background

People have introduced more stream organisms to Hawai‘i than any other Pacific island area. Most of these plants and animals were brought to the Hawaiian Islands within the last 100 years. Of the 400 or so streams in the state that flow year-round, only a handful host undisturbed native species, that is, species that arrived without the aid of people.

Among the more commonly introduced stream animals are mosquitoes, flies, minnows, guppies, tilapia, and frogs. In most cases, the insects were introduced accidentally. However, virtually all amphibians and many fishes were deliberately introduced. Some, like the



‘o‘opu

Tahitian prawn, were brought in for food, some for sport, and others, like the tilapia and bullfrog, were brought in to control previously introduced plant and animal species. Most non-native species have had some impact on native stream life. For example, tilapia prey upon native gobies (*‘o‘opu*) and compete with them for food and habitat. Tahitian prawns also compete with or consume native prawns, which are becoming rare in Hawaiian streams.

The four introduced animals presented in this activity are the tilapia, the bullfrog, the night mosquito (officially called the southern house mosquito), and the Tahitian prawn.

Teaching Suggestions

1. Parade around the classroom with a briefcase/suitcase/box, explaining that you are traveling to Hawai‘i. When you return to the front of the room mention that you have brought an animal with you. Explain that plants and animals that arrived in the Islands without human help are called “native.” (Refer to prerequisite activities.) Plants and animals that were brought by people, intentionally or accidentally, are “introduced.” Ask students why people would bring new plants and animals to Hawai‘i (food, medicine, make things from, attractiveness, pets, sport, and control previously introduced species).
2. Open the case and remove the mosquito card and tape it to the board, with the blank side facing out. Challenge the class to identify the animal using the clues provided.
3. Read the clues in sequence, and after each, allow students to either identify the animal or ask one question that can be answered with a “yes” or “no” response. The class could be divided into quarters with each section taking turns.

4. Periodically repeat the known clues. If students guess the animal before all the clues are read, summarize the more important points from the clue sheet.
5. When students correctly guess the animal, turn over the card, and pull another one from the briefcase. When all four introduced animals have been identified, mention that many other plants and animals have been introduced to Hawai‘i over the years.
6. Challenge students to solve one final riddle. What do all of these introduced animals have in common, besides the fact that they are introduced? (They all spend at least part of their life cycle in streams.)
- ✓ 7. Distribute the student activity sheets. Have students complete the illustrations of the introduced animals, color them, and write statements about why they were introduced. (Students having difficulty may wish to fold the pictures in half, hold them to a window, and trace them.)
8. Review students’ statements and discuss reasons for not introducing new animals to Hawaiian streams.)

Extended Activities

- Visit a nearby stream or other body of fresh water. Observe and try to identify members of the stream community. Refer to the illustrated stream life cards provided in the ‘Ōhi‘a Project Grade 4, Plants and Animals Unit, for more information and to the Field Sites Appendix in this guide for suggested sites.
- Make small models of the introduced stream animals to add to the stream scenario created in “Damsels and Dragons.”
- Have students write clues for other introduced animals, and challenge classmates to identify mystery critters. Resources for identifying native and introduced species:

Forest Treasures CD-ROM. 2001. Honolulu, Moanalua Gardens Foundation.

George W. Staples and Robert H. Cowie. 2001. *Hawai‘i’s Invasive Species*. Honolulu, Bishop Museum Press and Mutual Publishing.

Mike N. Yamamoto and Annette W. Tagawa. *Hawai‘i’s Native & Exotic Freshwater Animals*. 2000. Honolulu, Mutual Publishing.



Hawaii Biological Survey, Bishop Museum. <http://hbs.bishopmuseum.org/hbs1.html>

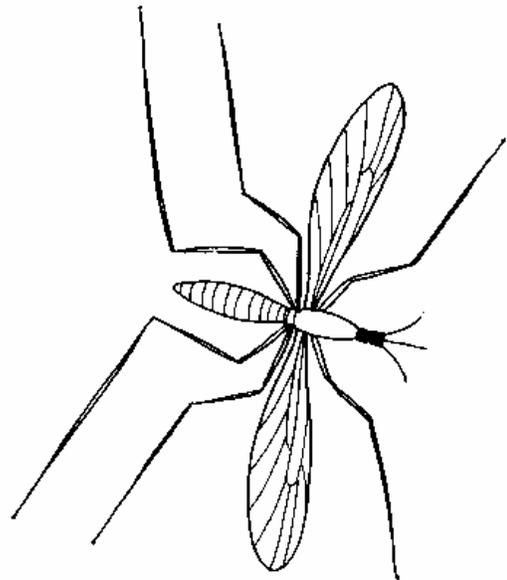
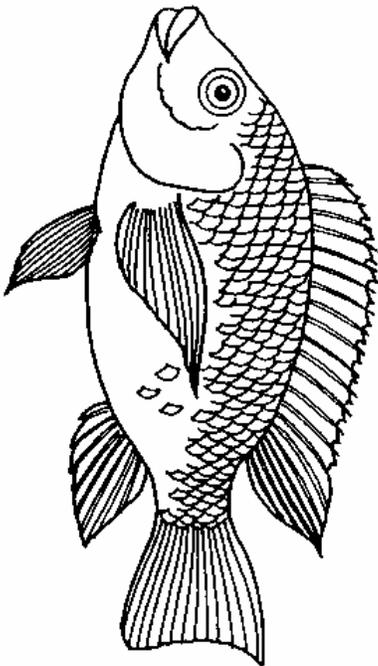
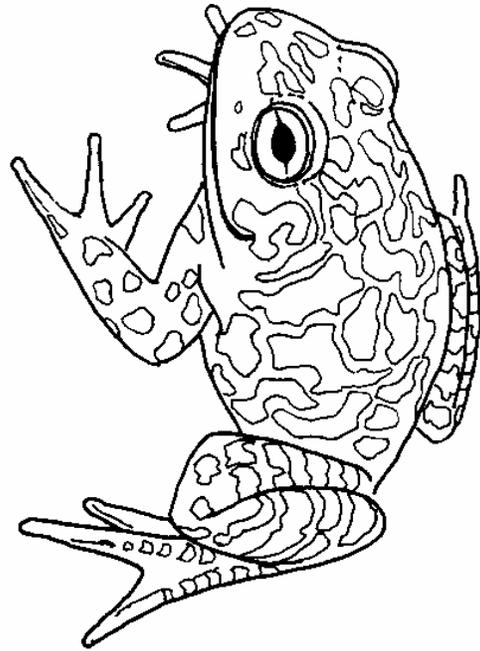
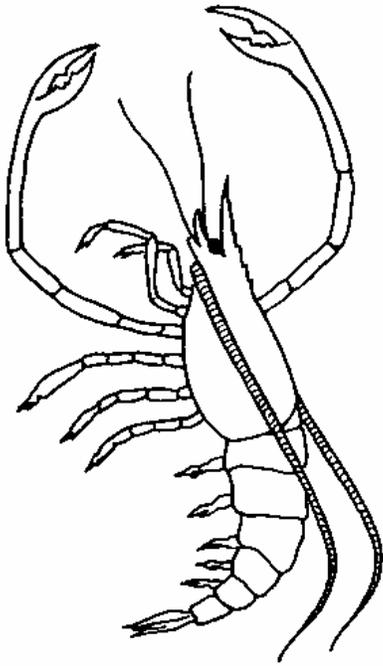
Hawai‘i Department of Land and Natural Resources, Invasive Species Watch
<http://www.hawaii.gov/dlnr/isw/iswhome.htm>
 Kalanimoku Building, 1151 Punchbowl St., Honolulu, HI 96813
 Phone: 587-0400; Fax: 587-0390

Hawai‘i Department of Agriculture
<http://www.hawaiiag.org/hdoa/>
Office of the Chairperson
1428 S. King St.
Honolulu, HI 96814
Phone: 973-9560
E-mail: hdoa.info@hawaii.gov

Hawai‘i Department of Health
<http://www.hawaii.gov/health>
1250 Punchbowl St.
Honolulu, HI 96813

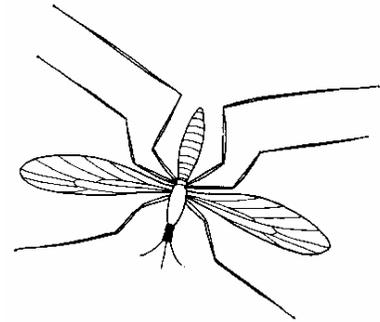
- Have students illustrate the life cycle of the bullfrog and mosquito, noting at which stage they live on land and when they live in water. Bring a tadpole into a classroom aquarium and observe its metamorphosis into an adult. (See the Unit Resources—*Hawaii Nature Study Program—Small Animals* by Sr. Edna Demanche.)
- Create stream animal booklets or riddle books with students’ illustrations. Stream animals introduced in other lessons can be added to their books.



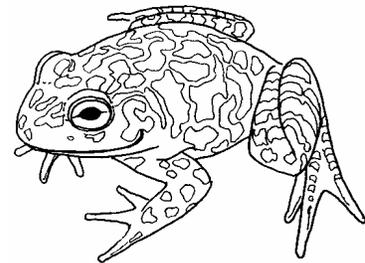


Mosquito

1. My Hawaiian name is *makika*.
2. Some people believe I was accidentally brought to Hawai'i a long time ago in a ship's water barrel.
3. Most people don't like me.
4. I lay eggs in water. After they hatch, my babies will be fully grown in 15 days.
5. Sometimes native stream animals, such as the dragonfly (*pinao*) or goby fish ('*o'opu*) eat my babies.
6. I am now found all over the world.
7. I can carry diseases that get spread to birds and people.
8. Some people use special lotions to keep me from biting them.
9. Our females suck blood.
10. I can make people itch.
11. Hearing me buzz around your head at night might keep you awake.
12. My name begins with an "m." Who am I?

**Bullfrog**

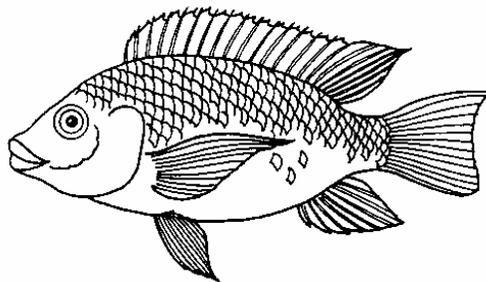
1. My Hawaiian name is *poloka luna*.
2. A long time ago, people brought me to Hawai'i from California to eat mosquitoes.
3. I am now found on all main Hawaiian Islands.
4. Some people like me because I eat mosquitoes, centipedes, slugs, mice and other garden pests.
5. Some people don't like me when I sing at night because I make a lot of noise.
6. I earned the first part of my name because of my size, strength and bellowing voice. An animal with a similar name is a male cow.
7. I am the first introduced amphibian to survive in Hawai'i.
8. I live along streams, marshes, ponds, or wherever there is fresh water.



9. I am the largest type of frog in the United States-up to 17 cm (7 in) long.
10. I have smooth brown and green skin.
11. The first letter in my name is “b.”
12. The next three letters are “u-1-1.” Who am I?

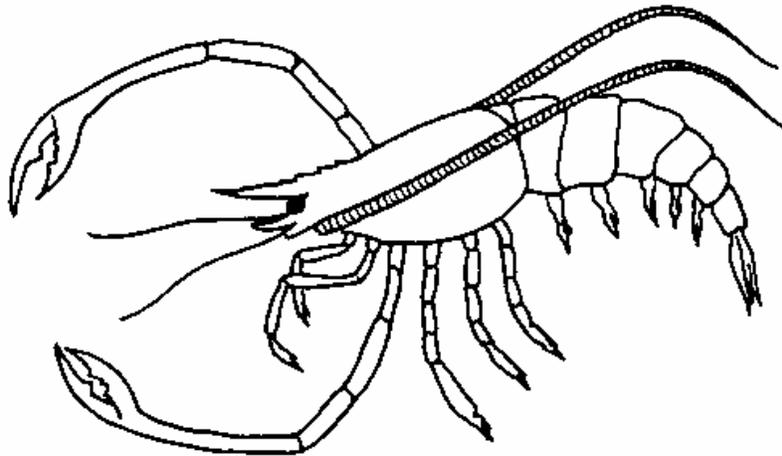
Tilapia

1. I am a fish.
2. My native home is Africa, but I live in many places now.
3. People brought me to Hawai‘i to eat algae growing in sugar cane ditches, but now I like to eat native Hawaiian shrimp.
4. My name begins with a “t.”
5. I like water that is partly salty, partly fresh.
6. Some people like to eat me.
7. I can grow to be twice as long as your hand.
8. When my babies are born, I can hold them inside my big mouth to protect them.
9. The second and third letters in my name are “il.”
10. Sometimes I am dark blue. Other times I am gray or brown.
11. I now live on all main Hawaiian Islands.
12. The last letters in my name are “p-i-a.” Who am I?

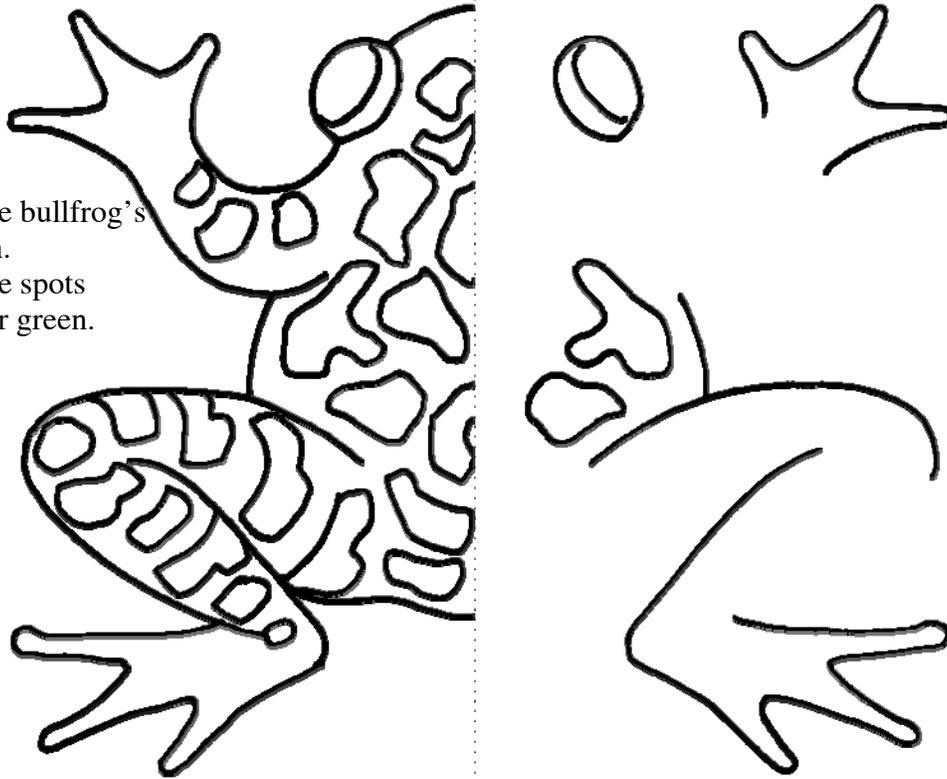


Tahitian Prawn

1. People brought me to Hawai‘i because I’m good to eat.
2. I was only introduced to a few streams, but I escaped and now you can find me on all the main Hawaiian Islands.
3. I also live in Tahiti.
4. My arms are long and thin.
5. The first part of my name is “Tahitian.”
6. I can grow as long as your foot-about 16 cm (7 in).
7. A native Hawaiian animal that shares the same last name with me is called the ‘ōpae ‘oeha‘a. It has one large claw and is only half my size.
8. I am a crustacean. I have a hard shell.
9. I eat native and introduced stream animals and compete with my native cousin for food.
10. The second part of my name rhymes with “yawn.”
11. I have claws at the end of my long arms.
12. I sometimes hide under rocks and wait for food to swim by. Who am I?



Color the bullfrog's
body tan.
Color the spots
brown or green.



Color the Tahitian
prawn's body orange.
Color the edges of the
body and legs blue.

