

### Objectives

The student will be able to do the following:

- Recall and define major concepts from class, including:
  1. definition, form, and placement of water
  2. Watersheds
  3. Ahupua'a
  4. Introduced, invasive, native species
  5. Cells
  6. Food chain
  7. Water cycle
  8. Types of pollution
  9. Types of water quality tests
- Identify three regions in an Ahupua'a (Uka, Kula, Kai)
- Define natural resources
- Discuss why conservation or mālama is important

### Materials

Popsicle sticks (approx 8-10 per student)

A copy of the worksheets – one per student – NOT double sided as they will be cut up

Crayons, markers, or colored pencils

String or ribbon (enough to yield approx 8-10 pieces per student)

Scissors

Stapler

Masking tape (at least one per group)

Glue (at least one per group)

Single hole puncher (if available)

Decorations, beads, shells (if desired or available)

### Background

This unit is a wrap-up unit designed to allow students the opportunity to (literally) tie all of the concepts of the class together. It uses the Ahupua'a as the central theme, particularly following on the visit to Waimea Valley. Students should review what they learned on the field trip, recall other major topics from class, and be able to place them on an ahupua'a. Students are then given the opportunity to make a mobile or map of popsicle sticks in which they tie drawings of the major concepts together.

### Advance Preparation

This unit is a final unit and should only be done as review after students have learned major concepts about water.

Each student should have a copy of the page with drawings on it. They can cut these apart themselves. Extra materials (string, scissors, etc.) should be separated by group if being shared.

## Procedure

1. Use the Ahupua'a as a central unifying theme for this unit. It might be helpful to draw a schematic of an ahupua'a up on the board and use this to illustrate concepts during the lesson.
2. Review the three main zones of the ahupua'a
  - Uka – mountains with big trees
  - Kula – plains with farms, homes
  - Kai – estuary with fishponds, nursery for animals
    - Define estuary – the place where salt water and fresh water mix
    - Define brackish – the term to describe water that is a mix of salt and freshwater
3. Define natural resources – products from nature that people use. Ask for some examples of natural resources (food, air, water, trees to make paper, grass to make baskets, etc.)
4. Ask students to remember what kinds of natural resources they found at Waimea.
5. Introduce the concepts of conservation (to save some for the future or to not use everything up at once) and mālama (to take care).
6. Ask students what they did to conserve resources at Waimea (the water conservation game) and what they did to mālama Waimea (plant aia)
7. Ask students why conservation and mālama are important. (Those students who take part in the monthly cleanups are showing their mālama). Similarly, those students who take care not to litter, etc.
8. Bring the conversation back to water – which is a very important natural resource
9. Ask students what we can do to mālama water – they may have many examples but point out that learning about water is important so that we know what to do to keep water clean.
10. Go over the water quality tests from Waimea (if they are still available and valid).
11. Tell students that everything they've learned about water this semester has been connected and all part of learning how to take care of their environment. Have students recall things they have learned in class and use the ahupua'a as a backboard to place those things or to discuss their importance:
  - Forms of water – liquid, solid, gas. Where can you find these in an ahupua'a?
  - Location of water – where can you find water in an ahupua'a (stream, in plants, in the soil, at the end in the ocean, clouds, rain, etc.)
  - How does water get into the ahupua'a (water cycle – precipitation, condensation, evaporation, streamflow)
  - What is water used for in an ahupua'a (drinking, bathing, cleaning a house, feeding animals, growing taro, etc.)
  - What is a watershed? How are Ahupua'a and watersheds similar and different? (Watershed is a physical feature of the land. Ahupua'a is a political division. Ahupua'a usually follow watershed boundaries, but may overlap).
  - What lives in an ahupua'a? (Use this to discuss introduced, invasive, and native species; invasive species are those introduced species that take over and displace native species. Not all introduced species do this).
  - What are the living things in the ahupua'a made from? (Cells)

- How are they all connected (Food chain)
- What can hurt living things in an ahupua'a? (pollution – go over types)
- How do we know if there is pollution? (Water quality testing)
- What can we do to take care of our watershed and ahupua'a? Clean, not litter, don't allow pollution into stream, don't wash cars next to stream, etc.)

## Activities

1. Students will have a worksheet with various graphics to describe the concepts they have learned about water. They can color and cut apart these graphics, and then create a mobile or map or something out of popsicle sticks that holds the concepts together. Students can tie, glue, or staple the concept papers to the popsicle sticks so that they are all connected.

Graphics from:

Ice cube – [www1.istockphoto.com](http://www1.istockphoto.com)

Water molecule – [www.shorstmeyer.com](http://www.shorstmeyer.com)

Pot with steam – [mansfieldct.org](http://mansfieldct.org)

Picking up trash – [www.jackiechankids.com](http://www.jackiechankids.com)

Tap water – [voiceofcanada.files.wordpress.com](http://voiceofcanada.files.wordpress.com)

Food chain – [library.thinkquest.org](http://library.thinkquest.org)

Test tube – [www.dkimages.com](http://www.dkimages.com)

Car wash – [thumbs.dreamstime.com](http://thumbs.dreamstime.com)

Watershed - [www.epa.gov/safewater/kids/wsb/pdfs/351.pdf](http://www.epa.gov/safewater/kids/wsb/pdfs/351.pdf).

Food chain - [http://www.climatechangenorth.ca/section-BG/BG\\_HS\\_10\\_O\\_E.html](http://www.climatechangenorth.ca/section-BG/BG_HS_10_O_E.html)

Cells - <http://www.bbc.co.uk/schools/gcsebitesize/biology/cellprocesses/1cellfunctionsrev2.shtml>

People - <http://www.state.hi.us/dlnr/dofaw/kids/teach/index.htm>

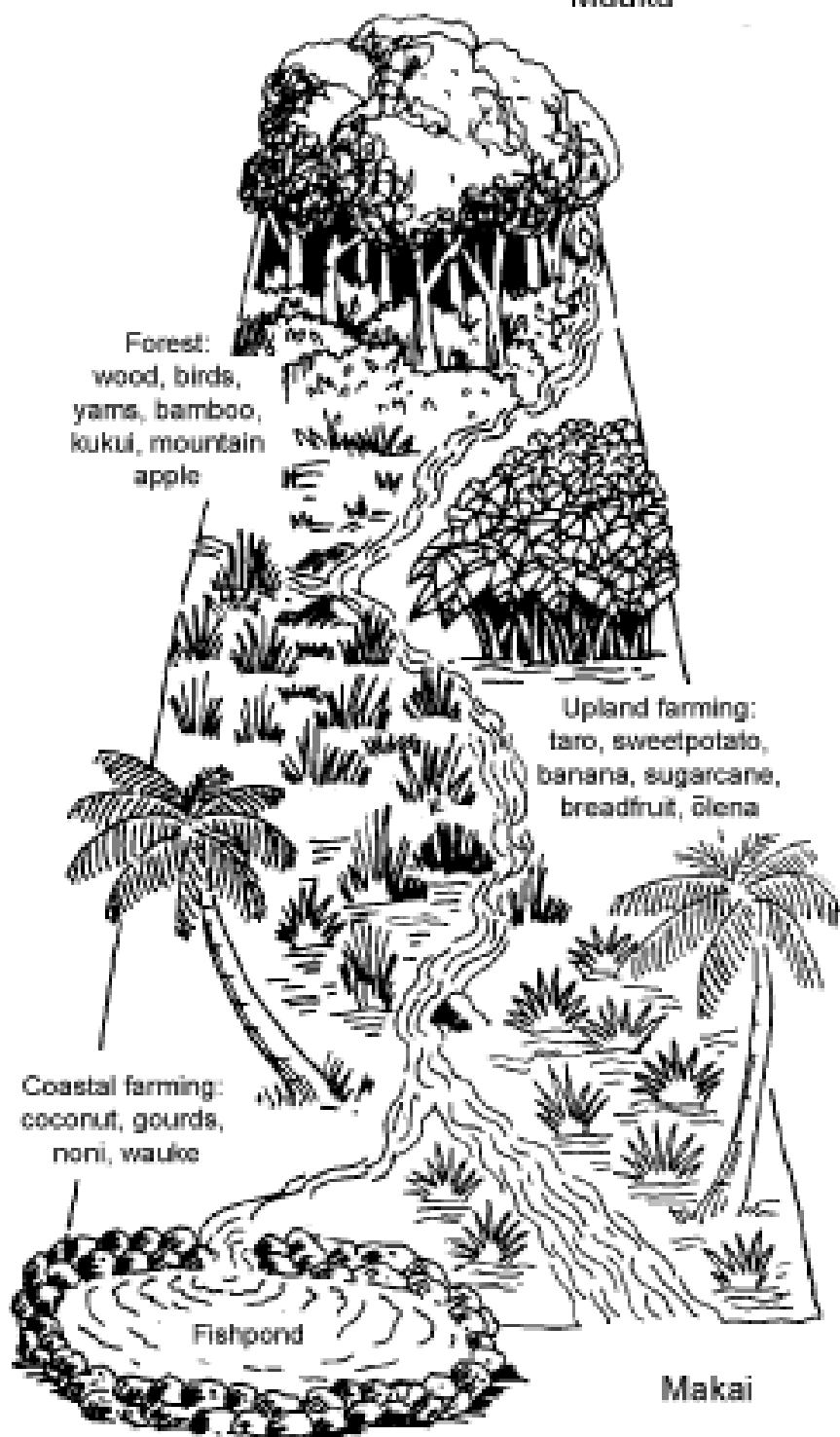
Mongoose - <http://www.state.hi.us/dlnr/dofaw/kids/teach/index.htm>

Native bird - <http://www.state.hi.us/dlnr/dofaw/kids/teach/index.htm>

Natural resources plant - <http://www.state.hi.us/dlnr/dofaw/kids/teach/index.htm>

Water cycle - <http://www.kidzone.ws/WATER/bactivity1.htm>

Mauka



### An ahupua'a

Drawing from the College of Tropical Agriculture & Human Resources, UH Manoa, Cooperative Extension Service, May 1999