

# Tying it all together in a watershed

## Lesson 10

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### 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 and ahupua'a
  3. Water cycle
  4. Modeling and studying watersheds by making hypotheses
  5. Streamflow; inputs and outputs and how land use impacts these
  6. Types of land use
  7. Types of pollution
  8. Types of water quality tests
- 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)

### Background

This 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 watershed concept as the central theme. Students should be able to recall major topics from class and be able to place them on a watershed. Students are then given the opportunity to make a mobile or stick chart 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 Watershed as a central unifying theme for this unit. It might be helpful to draw a schematic of an Watershed up on the board and use this to illustrate concepts during the lesson.
2. Identify the three main zones of the ahupua'a and link it to watershed (that ahupua'a generally follow watershed boundaries but are not watersheds. Watersheds are physical features, ahupua'a are political divisions).
  - 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. Introduce the concepts of conservation (to save some for the future or to not use everything up at once) and mālama (to take care).
4. Ask students why conservation and mālama are important.
5. Ask for some examples of conservation or mālama. Discuss that one way to take care of our environment is to learn about it.
6. 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 or watershed as a backboard to place those things or to discuss their importance:
  - What is a watershed?
  - Forms of water – liquid, solid, gas. Where can you find these in an watershed?
  - Location of water – where can you find water in a watershed (stream, in plants, in the soil, at the end in the ocean, clouds, rain, etc.)
  - How does water get into the watershed (water cycle – precipitation, condensation, evaporation, streamflow, seepage, transpiration, uptake)
  - What is water used for in an watershed (drinking, bathing, cleaning a house, feeding animals, growing taro, etc.)
  - What influences streamflow?
  - What are some land uses in the Manoa watershed?
  - What can hurt living things in an watershed? (pollution – go over types)
  - How do we know if there is pollution? (Water quality testing)
  - Stress that learning is only useful if it's remembered, so we'll do an activity that will give them something to help them remember all they've learned.

## 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:

Irrigation – [www.fotosearch.com](http://www.fotosearch.com)

Water cycle – hydrology.neng.usa.edu

Data and streamflow – ga2.er.usgs.gov

House – health.discovery.com

Factory – [www.wpclipart.com](http://www.wpclipart.com)

Flood – themoneyalert.com

Types of pollution – roanokecountyva.gov

Car wash – thumbs.dreamstime.com

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

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

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

Ice cube – www1.istockphoto.com

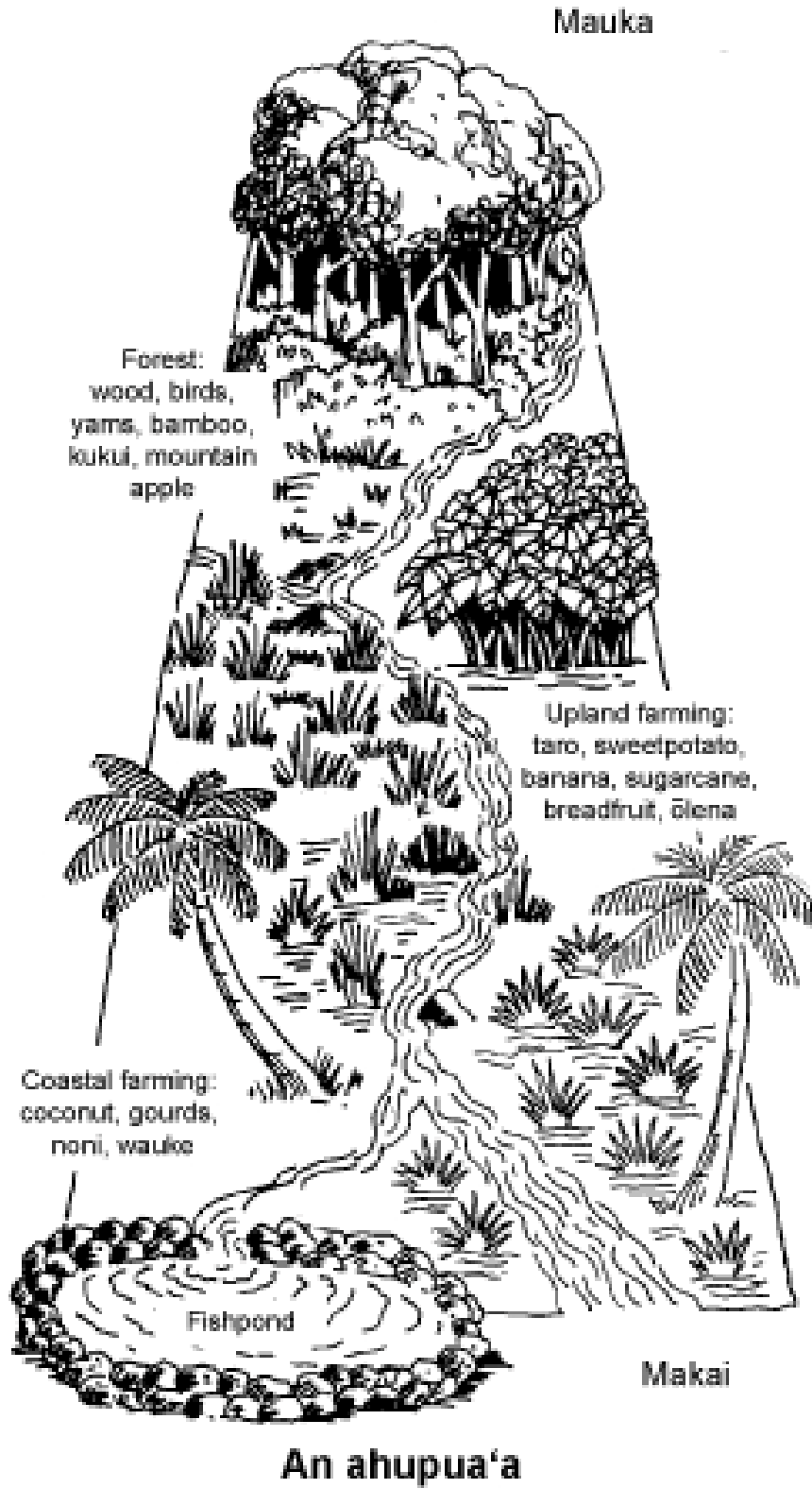
Pot with steam – mansfieldct.org

Tap water – voiceofcanada.files.wordpress.com

Water molecule - <http://hercules.gcsu.edu>

Ohi'a Tree - <http://www.state.hi.us/dlnr/dofaw/kids/teach>

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



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