



# HAWAIIAN RAINFOREST ECOSYSTEM WATERSHED FRIEND MASKS

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## SUBJECT

**Hawaiian Rainforest Ecosystems**

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## TIME

30 minutes

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## LOCATION

Any open area

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## GRADE LEVEL

Best for grades 3 to 6

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## GROUP SIZE

10 - 12 learners

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## GOALS

To facilitate an understanding of the concept of an ecosystem. To help students understand that all parts of an ecosystem relate to each other.

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## OBJECTIVES

1. Students will define the term ecosystem.
  2. Students will participate in creating a “web of life” with string to demonstrate the relationships between parts of an ecosystem.
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## MATERIALS

- String or yarn for the web
  - “Watershed Friends” masks
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## PREP

Have masks printed on cardstock. Print double-sided so species information is printed on the back. Depending on the student’s age, the masks can be cut out prior to the activity.

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## ATTENTION

Frame the activity as a game and a role-playing exercise.

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## GRABBER

## PROCEDURE

1. Give each student a mask to color. Each person in a group should have a different species or element to color. If there are more students than species/elements students can double up on species like the koa bug or ‘akiapolā’ au; these can represent other species of bugs/birds. If there are enough people, split the class/group into two groups; each group will have one of each species. The students must read the blurb on back of their mask and be able to teach the rest of the class about their species. When students have completed coloring, have them gather in a large circle, wearing their masks.
2. Ask students to define ecosystem in their own words, based on any prior knowledge. No right or wrong answers, just to gauge understanding. If the term “relationship” comes up, expand on it, and if not, mention its importance. Give the definition: All the plants, animals, and environments in one unit of nature, including their relationships. Ask students “what is a system?” It’s a set of connected things or parts forming a complex whole.

## PROCEDURE

3. Tell students: “We are going to create a visual representation of a Hawaiian rainforest ecosystem, and the relationships within it, by making a giant web.”
4. Go over each of the species. Have each student say the name of their species and unique facts about the species they have learned from the masks. Elaborate if necessary so that students will understand the where each species fits into the ecosystem.
5. Bring out the ball of yarn and describe how the yarn represents the connection between the different parts of the forest ecosystem. Explain that the ball will be passed around, but everyone will hang on to a piece of the yarn as it’s passed.
6. Start forming the web by holding on to the loose end of yarn and tossing the ball to a part of the ecosystem that is somehow connected to your role. This should form a line of yarn across the middle of the circle. For example, you’re the akiapola’au, so you toss it to the koa. There is usually more than one role connected to yours (‘akiapolā’au could toss it to, water, wind, etc.) but just choose one. Before you toss the ball, you have to say whom you are tossing it to and how they are connected to you.
7. Keep tossing the yarn in the same way until everyone is holding the yarn as a part of the web. Discuss the connections that are visible and how different parts are related. “This is an example of a healthy Hawaiian rainforest.”
8. Ask students for the four reasons why species become endangered: you are looking for the following: pollution, habitat loss, introduced species, commercial exploitation. “When species become endangered or extinct, their role in the ecosystem is lost, and that affects many other organisms and environments. For example, due to habitat loss, the māmane goes extinct. Due to pollution from development, water is contaminated. Due to introduced species the mosquito and pig, the ‘akiapolā’au goes extinct. Due to commercial exploitation, koa becomes endangered.” Each part affected must then drop the yarn they are holding. Other roles then tug on their yarn and the web falls apart. Discuss the visual of the ecosystem web collapsing when just a few parts are affected. An ecosystem needs all parts to be healthy.

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## REFLECT

Ask students for the definition of an ecosystem in their own words.

**Ecosystem:** A biological community of interacting organisms and their physical environment.

**Ecology:** the branch of biology that deals with the relationships of organisms to one another and to their physical surroundings.

*Adapted from Sharing Nature with Children by Joseph Cornell*

## ENRICHMENT ACTIVITIES

- Find other Watershed Friends. Have the students research another organism that would fit into the Rainforest Web. Students should find out what this organism eats, who eats it, connections to other species, and what other roles it serves the rainforest. Have them create a mask for this organism. Have the students teach the rest of the class their organism. Play the web game with the new species in the web.
- Make food web mobiles. Have each students select a plant of animal that is part of the rainforest ecosystem or other native ecosystems. Students should research their organism's place in the food web and make a cutout of all the food web organisms from construction paper and markers (or other media if they choose, or you have on hand). Using a hanger and thread or fishing line, hang cutouts in the proper arrangement students can create a mobile that reflects their food web.
- Make a web of life mural. Help students create a forest mural showing the web of life. Have them draw an ahupua'a, from ridge to reef, on large sheets of cardboard. Add photos or drawing of organisms featured in the masks, or add more species; don't forget the makai organisms! By placing a pushpin next to the plant or animal, they can use yarn to connect organisms to that directly connect. Explain connections from ridge to reef.
- Play a mauka to makai web game. Have students color both the mauka and makai Watershed Friend Masks. Form two separate circles, one mauka, one makai, to play the web of life game. See if the students can make connections between the mauka and makai circles. Throw the yarn to appropriate plant or animal in the opposite circle when they make those connections. Ask the students what organisms not represented in their circles would make connecting the circles easier. (Think steam animals and plants) Have the students research those organisms. Find out what they eat, who eats them and their connections to mauka and makai.

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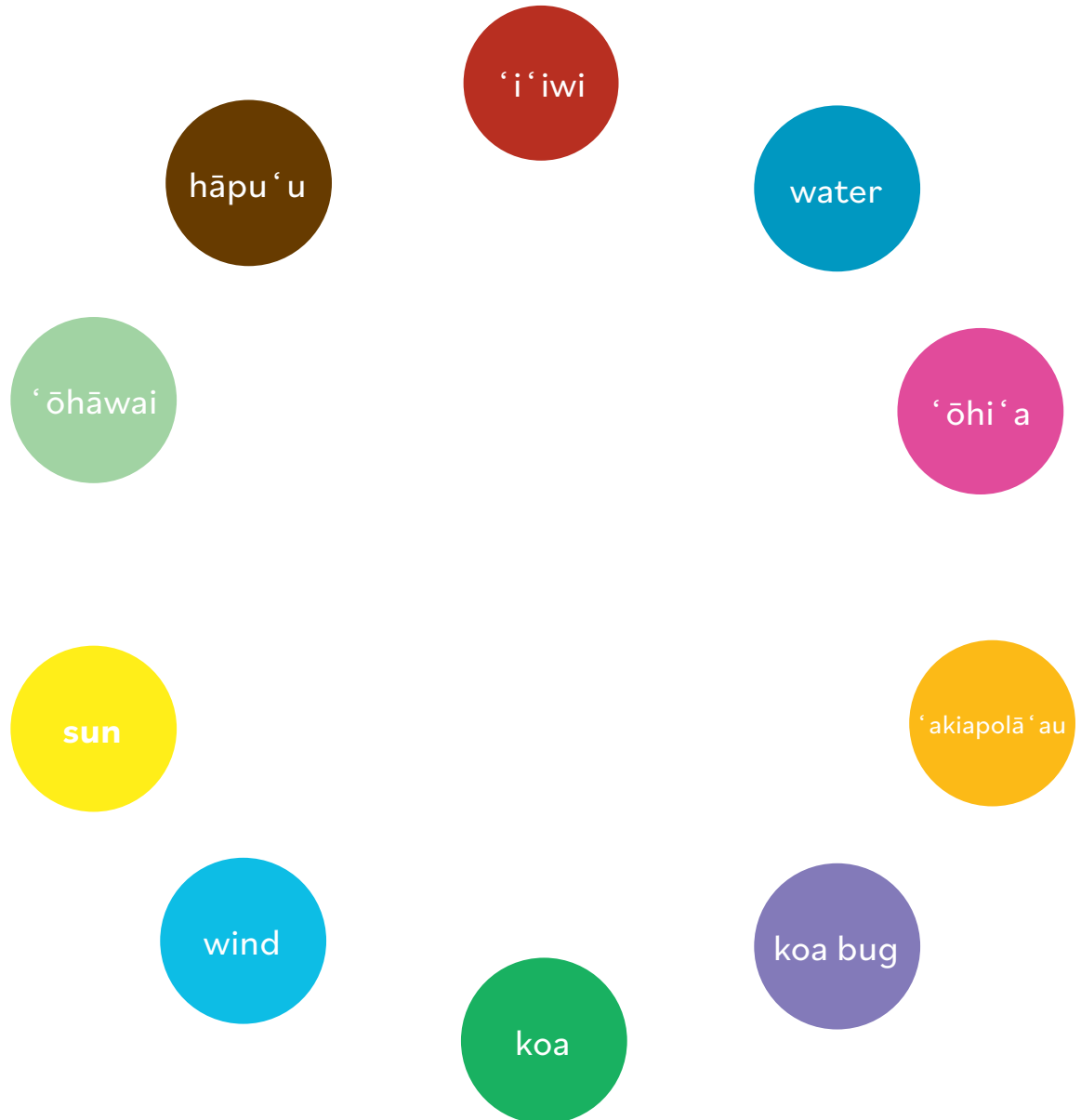
## TERMS TO KNOW

- **Climate:** Regular variations in weather in a region over a period of years
- **Cycle:** A sequence of events that is repeated again and again
- **Evaporate:** A change of a liquid into a vapor.
- **Endemic:** A species that is only found in a particular geographical region.
- **Fertilizer:** A chemical or natural substance added to soil or land to increase its fertility
- **Habitat:** The natural conditions and environment in which a plant or animal lives.
- **Keiki:** Child
- **Makai:** Towards ocean
- **Native:** A plant or animal that arrived to an area without the help of humans.
- **Nectar:** The sweet liquid that flowering plants produce to attract insects and small birds that assist in pollination.
- **Pulu:** Hair, wool.

# HAWAIIAN RAINFOREST WEB OF LIFE

Connect the circles to make a web of the relationships between plants and animals found in our Hawaiian rainforests.

1. Look at the following page for a list of connections between the different species.
2. Start with one organism or element. Draw a line connecting that circle to another circle (organism, or element) that has a relationship with it. These lines represent a dependence or relationship to that other creature or element.
  - For example: If you choose 'i'iwi, you would draw a line from the red 'i'iwi circle to water, wind, sun, 'ōhāwai, and 'ōhi'a.
3. Using a different color choose another organism or element and draw in those connections. It helps to match the color of your pen/pencil/crayon to the color of the starting circle.
  - Example: 'i'iwi = red.



# WEB OF LIFE CONNECTIONS

For each rectangle list other organisms or elements from the rainforest ecosystem that are connected to the organism or element in the right corner. Don't forget to include the relationship between the two!

<u>Organism/ Element</u>	<u>Relationship</u>
'i'iwi	

<u>Organism/ Element</u>	<u>Relationship</u>
'akiapolaau	

<u>Organism/ Element</u>	<u>Relationship</u>
wind	

<u>Organism/ Element</u>	<u>Relationship</u>
water	

<u>Organism/ Element</u>	<u>Relationship</u>
koa bug	

<u>Organism/ Element</u>	<u>Relationship</u>
'ōhāwai	

<u>Organism/ Element</u>	<u>Relationship</u>
hāpu'u	

<u>Organism/ Element</u>	<u>Relationship</u>
'ōhi'a	

<u>Organism/ Element</u>	<u>Relationship</u>
koa	

<u>Organism/ Element</u>	<u>Relationship</u>
sun	

# WEB OF LIFE CONNECTIONS (CHEAT SHEET)

‘i’ iwi

Organism/ Element	Relationship
water	hydration
sun	warmth
‘ōhāwai	food
‘ōhi’ a	food

‘akiapolāau

Organism/ Element	Relationship
water	hydration
sun	warmth
koa	habitat
koa bug	food

wind

Organism/ Element	Relationship
water	currents and waves
sun	heat creates wind
‘ōhi’ a	disperses seeds
hāpu’ u	disperses spores

water

Organism/ Element	Relationship
wind	currents and waves
sun	evaporation
‘ōhāwai	hydration
‘ōhi’ a	hydration
koa	hydration
hāpu’ u	hydration
koa bug	hydration
‘akiapolā’ au	hydration
‘i’ iwi	hydration

koa bug

Organism/ Element	Relationship
water	hydration
sun	warmth
koa	habitat
‘akiapolā’ au	prey

‘ōhāwai

Organism/ Element	Relationship
water	hydration
sun	nutrients
hāpu’ u	seedlings grow from trunk
‘i’ iwi	pollinates other ‘ōhāwai

hāpu’ u

Organism/ Element	Relationship
water	hydration
wind	disperses spores
sun	nutrients
‘ōhi’ a	acts as nurse log for seedlings
koa	water drips from koa leaves

‘ōhi’ a

Organism/ Element	Relationship
wind	disperses seeds
sun	nutrients to grow
‘ōhāwai	leaf litter makes soil seedlings
hāpu’ u	sprout from trunk habitat and
‘i’ iwi	flowers provide nectar

koa

Organism/ Element	Relationship
water	hydration
wind	blows mist to forests
sun	nutrients
‘ōhā wai	drips water to understory
hāpu’ u	drips water to understory
koa bug	habitat
‘akiapolā’ au	habitat

sun

Organism/ Element	Relationship
water	evaporation
wind	creates wind movement
‘ōhā wai	nutrients
‘ōhi’ a	nutrients
koa	nutrients
hāpu’ u	nutrients
koa bug	warmth
‘akiapolā’ au	warmth
‘i’ iwi	warmth