

CULMINATING LESSON **Wetland Investigators**

Lesson at a Glance

In this lesson, students learn how to research a topic effectively, and then work in small groups to research one of four Hawai'i wetlands. Students learn to conduct searches efficiently, to collaborate effectively, and to engage good speaking and listening skills while working in small groups. Students conduct searches on the Internet and in printed resources to gather information as they assume the role of naturalists.

Students synthesize their new knowledge into a short oral report, and prepare a visual aid. Together, the class develops an oral presentation rubric that will be used by all students. In small groups they deliver their oral presentations to the class, while other students must recall key ideas from presentations as they actively listen as members of the audience. In conclusion, each student must conduct self- and peer-assessments of the presentations.

Lesson Duration

Two 45-minute periods for research
Two 45-minute periods for report and visual aid
Two 45-minute periods for oral presentations

Essential Question(s)

How can doing your part in a group research project help educate others about Hawai'i's wetlands?

How can we deepen the public's understanding of the wetland ecosystem and how the organisms function within that ecosystem?

How can educating others about Hawai'i's wetlands make a difference?

Key Concepts

- Collaborating with group members will improve results in completing tasks successfully.
- Oral reports shared by naturalists can be effective ways to educate others about Hawai'i's wetlands and how the organisms function within that ecosystem.
- A visual aid in an oral presentation will help address the various types of learners in the audience.
- Assessing presentations done by peers and noting key ideas can help educate students.

Instructional Objectives

- I can describe the interdependent relationships among producers, consumers, and decomposers in a wetland ecosystem in terms of the cycle of water.
- I can use speaking and listening skills to fill a prescribed role in group activities.
- I can give informal presentations or reports to inform.
- I can recall oral messages by noting key ideas and relating them to the speaker's purpose.



Related HCPSIII Benchmark(s):

Science SC.5.3.2
Describe the interdependent relationships among producers, consumers, and decomposers in an ecosystem in terms of the cycles of matter.

Language Arts LA.5.6.1
Use speaking skills to fill a prescribed role in group activities.

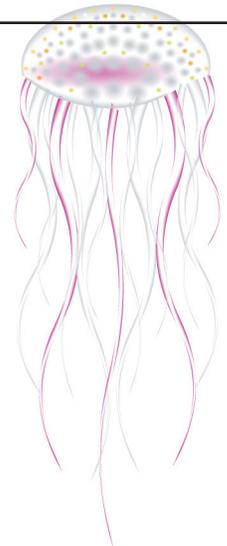
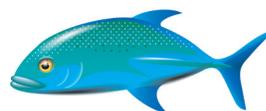
Language Arts LA.5.6.2
Give informal presentations or reports to inform in terms of matter.

Language Arts LA.5.6.3
Recall oral messages by noting key ideas and relating them to the speaker's purpose.

Assessment Tools

Benchmark Rubric:

Topic		Interdependence	
Benchmark SC.5.3.2		Describe the interdependent relationships among producers, consumers, and decomposers in an ecosystem in terms of the cycles of matter	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain and give examples of how specific relationships among producers, consumers, and decomposers in an ecosystem affect the cycling of matter	Describe the interdependent relationships among producers, consumers, and decomposers in an ecosystem in terms of the cycling of matter	Identify a few relationships between producers, consumers, or decomposers in an ecosystem in terms of the cycling of matter	Recall, with assistance, that matter cycles in an ecosystem among producers, consumers, and decomposers
Topic		Discussion and Presentation	
Benchmark LA.5.6.1		Use speaking and listening skills to fill a prescribed role in group activities	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Use speaking and listening skills to fill a prescribed role in group activities, in a highly effective way	Use speaking and listening skills to fill a prescribed role in group activities	Use some speaking and listening skills that assist in filling a prescribed role in group activities, in a limited way	Use irrelevant speaking and listening skills that do not relate to a prescribed role in group activities
Topic		Discussion and Presentation	
Benchmark LA.5.6.2		Give informal presentations or reports to inform	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Give highly effective informal presentations or reports that clearly inform	Give effective informal presentations or reports to inform	Give marginal informal presentations or reports that somewhat inform	Give ineffective informal presentations or reports that do not inform



Topic		Critical Listening	
Benchmark LA.5.6.3		Recall oral messages by noting key ideas and relating them to the speaker's purpose	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Recall oral messages accurately by clearly noting key ideas and relating them to the speaker's purpose, in a highly effective way	Recall oral messages by noting key ideas and relating them to the speaker's purpose, with no significant errors	Recall part of an oral message by noting a few key ideas and relating them to the speaker's purpose, or recall an oral message with a few significant and/or many minor errors	Recall little of an oral message by noting very few key ideas and not relating them to the speaker's purpose, or recall an oral message with many significant errors

Assessment/Evidence Pieces

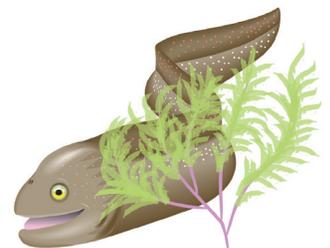
<p>Lesson</p> <ul style="list-style-type: none"> • Naturalist's Report (including proper citations) • Naturalist's Oral Presentation • Student Research Notes • Peer and Self Reflection Sheets

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • Board and markers • Computer with speakers • Method to project student presentations 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Computer with internet access • Books and print publications on wetland topics • Encyclopedia or other reference material • Materials to create a visual aid (i.e., poster board, markers, glue, scissors, etc.) 	<ul style="list-style-type: none"> • None

Instructional Resources

- Teacher Reading: *The Role of a Naturalist*
 Teacher Reading: *Naturalists Educating Others*
 Student Reading: *Wetland Research Online Resources*
 Student Worksheet: *Wetland Research*
 Student Worksheet: *Key Ideas*
 Student Worksheet: *Report References*
 Student Worksheet: *Recalling Key Ideas*
 Assessment Tool: *Benchmark Self-Assessment Checklist*



Student Vocabulary Words

body language: bodily mannerisms, posture, and facial expressions that can be interpreted as unconsciously communicating somebody's feeling or psychological state.

citation: a reference to a book, article, web page, or other published item with sufficient details uniquely to identify the item.

collaboration: all processes wherein people work together, especially in a joint intellectual effort.

constructive: carefully considered and meant to be helpful.

enunciate: to pronounce something distinctly and clearly.

eye contact: the act of looking directly into the eyes of another person.

feedback: comments in the form of opinions about, and reactions to something intended to provide useful information for future decisions and development.

key word: any word used in a reference to link to other words or other information.

naturalist: a person committed to studying nature or natural history.

paraphrase: restatement of a text in different words.

self-aware: knowing oneself well, having a balanced and honest view of one's own personality, and often an ability to interact with others frankly and confidently.

visual aid: something that is looked at as a complement to a lesson or presentation.

Lesson Plans

Lesson Preparation

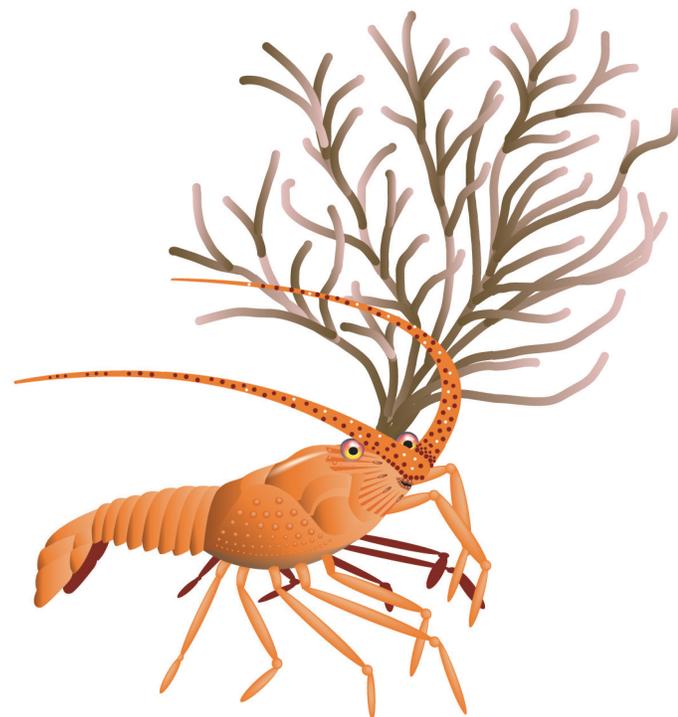
- Review the Science Background provided in the Unit Overview and the Teacher Reading, *The Role of Naturalist* and *Naturalist Educating Others*.
- Make copies of the Student Reading *Wetland Research Online Resources*, and the Student Worksheets *Wetland Research*, *Key Ideas*, *Report References*, *Recalling Key Idea*, and *Benchmark Self-Assessment Checklist*, one for each student.
- Gather books and publications from the library for each group to use. Preview the suggested websites that students will use. Decide how to facilitate each group researching on the Internet. When using classroom computers, arrange for equal time on the computer (timed rotations) for each group.
- Preview images of naturalist at the following websites:

Naturalists at large

<http://www.naturalists-at-large.com/>

Naturalist Corp

http://channelislands.noaa.gov/edu/edu_natc.html



- Decide what options you will give students for developing a visual aid, and arrange for facilitating use of materials and equipment. For instance, if you allow students to refer to a website during their presentation (to display an image, etc.), give students time to get online and choose their website. Or, if you allow students to make poster boards (with diagrams, etc.), provide sufficient materials to accomplish this task.
- Review the *Report References* worksheet to see what each group will be required to complete as they prepare their reports. Referencing each book, website, and image used in students' reports is important.
- Prepare the computer, projector, and/or designated space for presenters to set up their visual aids. Make sure all audience members will be able to see the visual presentation. Move desks as needed.

I. *Efficient Research Strategies*

- Facilitate a discussion on effective researching and proper citation of resources. Find out from students what they already know.
- As a class, develop a list of key words for a practice research topic. List on the board the key words that students come up with. Ask for students' help in identifying the top three or four key words to use, and circle them. For purposes of this exercise, use key words students selected, and follow the following guidelines.
- Project a sample website onto the screen to practice, as a class, and conduct a few searches. Use a search engine or information source already screened for inappropriate content. The following two sources may be useful for this exercise:
 - 1) <http://www.askforkids.com/>
 - 2) <http://www.factmonster.com/>
- When conducting a search online, type one or more key words into the search field.
- Review with students how to use key words when using printed resources for research. Invite students to help demonstrate how to use the Table of Contents and the Index of the print resources available.
- Lastly, review with students the importance of paraphrasing information, as opposed to copying sources word for word. Students must put ideas into their own words as they take notes. Citing sources in a standardized way is important. Make sure students abide by your classroom and/or school policy for citations.

II. *Research Wetland Topics*

- Establish the small groups, and distribute the student worksheet *Wetland Research* to each student. Then, assign one of the following Hawaiian wetland types to each group to research: Palustrine Wetlands (Marshes/Bogs), Riverine Wetlands, Estuarine Wetlands, Marine Wetlands, and Taro *Lo'i*.
- Have students start by developing initial questions on their topic, and then listing key words they could use for online or index searches. Remind students to add new key words to their list of key words as they learn more about their assigned topic.
- Facilitate students' use of printed materials and computers with Internet access. Make sure that the students refer to the appropriate list of online resources provided in the Student Reading *Wetland Research Online Resources*.



III. A Naturalist's Oral Presentation

- A. Present the images of a naturalist on the computer project or screen showing them at work, presenting in the field, and presenting to various audiences. Define for the students the role of a naturalist.
- B. Explain that the task of each small group of students is to prepare a 5-7 minute naturalist's oral report on the topic they researched. The presentation could be an oral report with visual aids, a PowerPoint presentation, role playing as investigative news reporters, or as a TV "special assignment report." Other possibilities include presenting ideas in the form of a podcast, debate, acted out as a mini-drama, etc.
- C. Work with students to create a checklist as a guide for them as they prepare their oral presentation (some examples are below):
 - 1) Choose a local example that represents the Hawaiian wetland type assigned to the group.
 - Give the name of this wetland and its type.
 - What is the history of your wetland?
 - What are the features of your particular type of wetland?
 - List and describe the plants and other organisms found in your particular type of wetland. Tell what type of plant or other organism they are (i.e., producer, consumer or decomposer). What does the food chain look like in this type of wetland (Use what you learned in previous lessons about the interrelationships among producers, consumers, and decomposers; how matter cycles and energy flows in wetlands.)?
 - What are the issues facing your wetland?
 - 2) Use visual aids, such as images, a map, or diagrams to help present and explain information.
 - 3) Plan your group presentation so that everyone in the group has a chance to speak.
- D. Pass out to students the *Key Ideas* and *Report References* worksheet and go over them. Provide access to the resources students used in the previous lessons, so that they are able to complete their *Report References* worksheet.
- E. Allow time for students to create some type of visual aid, depending on what options you decide to give them. At this time, provide necessary poster board, time for printing or coloring diagrams and pictures, and/or allow them access to computers for multimedia presentation development.
- F. Allow students time, toward the end of the period, to practice their report within their group. Collect the *Key Ideas* and *Report References* worksheets.

IV. Oral Presentation Assessment Criteria

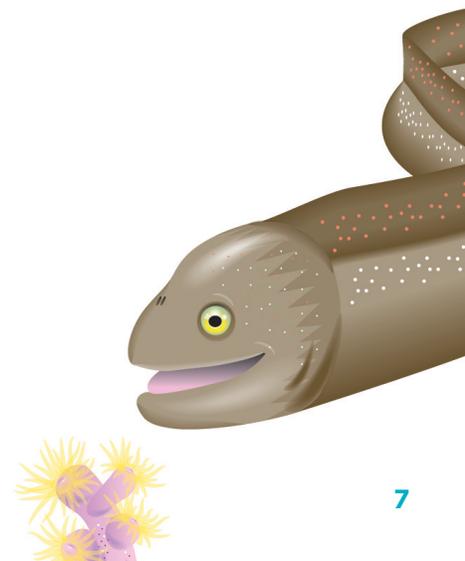
- A. Guide the class in developing an oral report rubric. Explain that this rubric will be used for self- and peer-assessments.
- B. Refer to the Benchmark LA.5.6.2 Rubric to generate ideas with students.
- C. As the students give suggestions, write the rubric on the board, or if you prefer use the computer projector and type the rubric in a table as you go.

V. *How to be an Effective Naturalist*

- A. Distribute the rubric assessments and review the criteria. Be sure to coach students on the most effective and polite way to share constructive feedback with their peers.
- B. Distribute the *Recalling Key Ideas* worksheet, and tell students that, besides evaluating the overall presentation by their peers, they must also take brief notes on each presentation.
- C. Have each group share their presentation. Allow about five minutes following each presentation for audience assessment and recalling of key ideas. Make sure presenters also take advantage of this time to complete their self-evaluations. Be sure to conduct your own teacher's assessment during this time.
- D. Collect student assessments for each presentation prior to the start of the next presentation.
- E. At the end of all presentations, and after a brief screening of the peer assessments for appropriateness, allow each group to read through the assessments provided by their peers for their group.

VI. *Assessment*

- A. During the lesson, as each student completes his/her research, prepares the oral report and gives the oral presentations, conduct formative assessments by viewing the appropriate Self-Assessment form.
- B. Conduct summative assessment for this lesson by grading the worksheets and noting participation in discussions, using the Rubric Assessment, their self-assessment and your assessment of each oral presentation.



Extended Activities

Science:

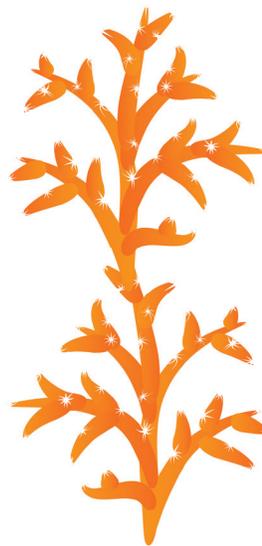
1. Take a field trip to a local coastal wetland, and while there, have students investigate their topic by inviting along real naturalists, or experts with expertise on their topic.
2. Invite a local wetland naturalist or scientist into your classroom to speak about his/her experiences in their area of expertise.

Language Arts:

1. Allow students to do multiple presentations to other classes at school prior to their class presentations, so that student presenters have opportunities to refine their presentations as naturalists.
2. Have students make flash cards of the vocabulary words, using students own definitions with graphic representations.

Technology Integration Ideas:

1. Take pictures of each group presenting to add to their portfolios.
2. Record all presentations with a video camera for subsequent reviewing as a class, or in small groups. Add these videos to students' portfolios.



CULMINATING LESSON - Teacher Reading

The Role of a Naturalist

Students, residents, and visitors of Hawai‘i need to become aware of the importance of wetlands. Wetlands are much more than just a pleasant habitat for Hawai‘i’s unique, endemic birds. Wetlands play an important role in ocean preservation and natural protection from flooding. Students can become ambassadors of the wetlands by becoming scientists and naturalists.

In this lesson, students take on the role of naturalists. A naturalist is a scholar, or student of natural history, the science of the natural world. Wetland naturalists might specialize in a number of different features of the wetland ecosystem. A few of the topics worthy of study by each group of students are addressed in this lesson. For more information on each specific topic, refer to the resources listed in the Student Readings and References for Teachers sections.

Ideally, a naturalist will go out into the field to conduct part of his or her research, but a large portion of research can be done online and through print materials. Naturalists also collaborate with one another regularly.

The following resources provide additional information:

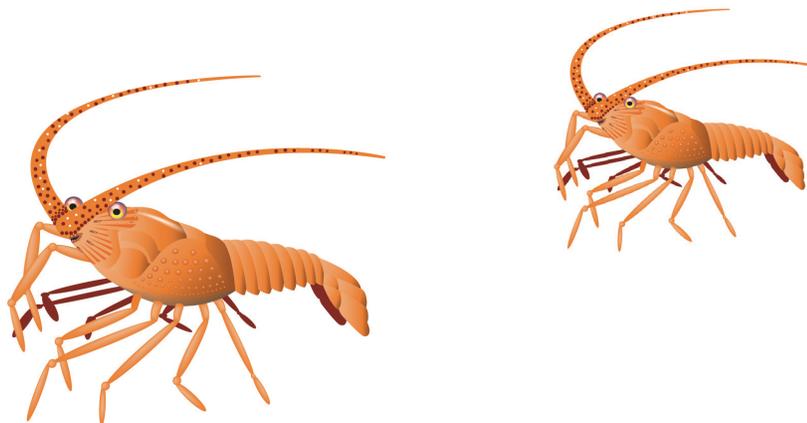
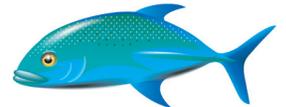
Kimball, John W. (2006). *The carbon cycle*. Retrieved January 15, 2007, from <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/CarbonCycle.html>

MSN Encarta. (2007). *Methane*. Retrieved February 7, 2007, from http://encarta.msn.com/encyclopedia_761568077/Methane.html

Pearson Education. (2007). *Marsh gas*. Retrieved February 7, 2007, from <http://www.factmonster.com/ipd/A0529869.html>

WestEd. (2000). *Matter cycles*. Retrieved January 29, 2007, from http://www.planetguide.net/book/chapter_2/chapter2.html

WQM. (2004). *Aquatic ecosystem health - bioaccumulation as a monitoring tool*. Retrieved January 18, 2007, from <http://www.nwrc.usgs.gov/fringe/function.html>



CULMINATING LESSON - Teacher Reading

Naturalists Educating Others

Naturalists often perform the role of educating the public. One of the ways they do this is through oral presentations. Ideally, they might lead a tour through the setting in which they have expertise. Otherwise, a presentation that includes images and visual aids can be effective in addressing the learning styles in the audience. Effective speakers will enunciate their words, speak loudly, and use eye contact with their audience.

The following resources provide additional information:

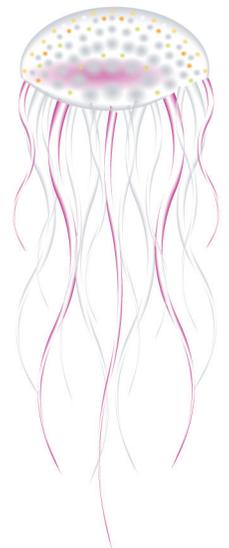
Roger Tory Peterson Institute of Natural History. (2007). *Just what is a naturalist?* Retrieved February 11, 2007, from www.enaturalist.org/faq/13

McCullen, Caroline. (1997). *Presentation rubric*. Retrieved February 11, 2007, from www.ncsu.edu:80/midlink/rub.pres.html

Active Audience Participation

Students have much to gain through self- and peer-evaluations when doing oral presentations. Often, students are unaware of good and bad presentation techniques until they see their peers at the front of the class, or until they hear directly from their peers how they might improve their own presentation techniques.

Actively listening and recalling ideas from peers' presentations can be a difficult task for students, because the presenters are their friends and classmates. As such, students may find it especially challenging because they are required to do two tasks at once: 1) assess each group's presentation, and 2) recall key ideas from each group's presentation. However, with proper preparation and use of the rubric and worksheet provided in this lesson, they should be able to accomplish this task successfully.



CULMINATING LESSON - Student Reading

Wetland Research Online Resources

Pacific Coast Joint Venture - Hawaii Wetlands Information

<http://pcjv.org/hawaii/wetlands/panels.html>

Hawai'i Resources for Students and Teachers

<http://www.k12.hi.us/~tlcf/marcopolo/curriculum/hawaiiresources.htm>

Environmental Protection Agency (EPA)

<http://www.epa.gov/OWOW/wetlands/index.html>

Fish and Wildlife Service, Pacific Island Threatened and Endangered Species

<http://www.fws.gov/pacificislands/teslist.html>

Heeia Fish Pond – Paepae o Heeia (Oahu)

<http://www.paepaeoheeia.org/index.php>

Hawai'i Wetland Information Network

<http://hiwetlands.com/index.html>

Hawaiian Ecosystems at Risk - Hawaiian bog photos (Maui, Greensword Bog)

http://hear.smugmug.com/Photos-from-Betsy-H-Gagne/Hawaii-bogs/7613837_Vvgqn#514034210_uLxLW

Hamakua Marsh (Oahu)

<http://hamakuamarsh.com/mainmenu.htm>

Hule'ia National Wildlife Refuge (Kauai)

<http://www.fws.gov/huleia/>

Hanalei National Wildlife Refuge (Kauai)

<http://www.fws.gov/refuges/profiles/index.cfm?id=12522>

James Campbell National Wildlife Refuge (Oahu North Shore)

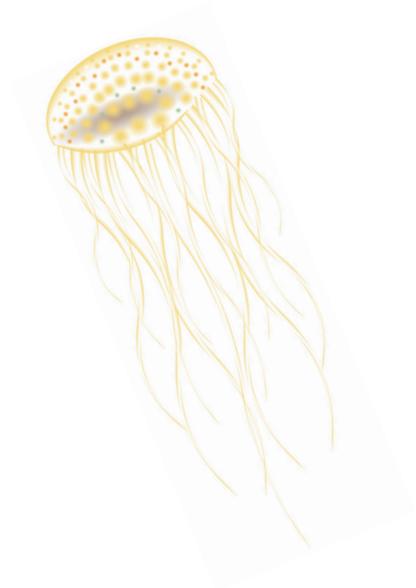
<http://www.fws.gov/jamescampbell>

Keālia Pond National Wildlife Refuge (Maui)

<http://www.fws.gov/kealiapond/index.html>

Kawai Nui Marsh (Oahu –kid*)

<http://www.kawainuimarsh.com/Site%20Folder/index.html>



Kaelepulu Pond (Oahu kid*)

<http://library.thinkquest.org/J0110028/splash.htm>

Ka'elepulu Pond Wetland (Oahu)

<http://www.kaelepuluwetland.com/>

Kakahaia National Wildlife Refuge (Molokai)

<http://www.fws.gov/kakahaia/>

Kaloko-Honokohau National Historic Park (Hawaii)

<http://www.nps.gov/kaho/index.htm>

Kauai Native Wetland birds

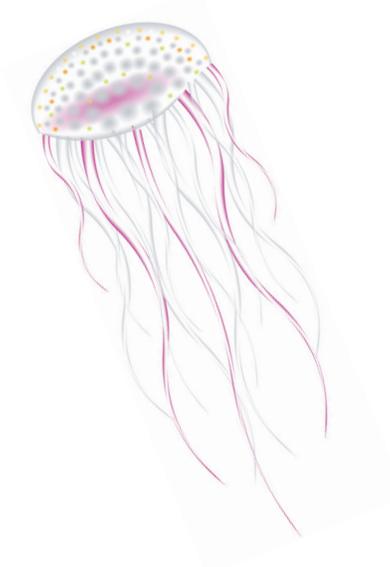
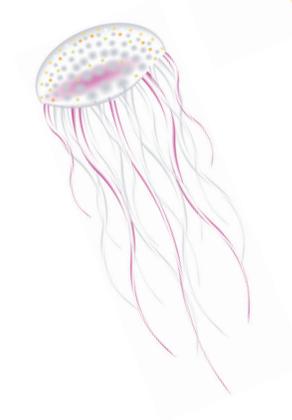
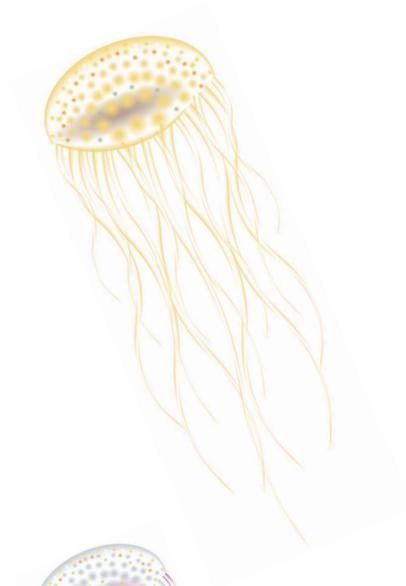
<http://www.kauaibirds.com/nativewetlandbirds.htm>

Pearl Harbor National Wildlife Refuge (Oahu)

<http://www.fws.gov/pearlharbor>

Waihe'e Refuge (Maui)

<http://www.mauicoastallandtrust.org/waihee.php>



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Wetland Research

Name: _____ Date: _____

Group's Topic: _____

Write three questions about your group's topic. What do you want to know? Then, write key words that will be useful in the research process.

Questions about this topic	Keywords

Notes from Research (Including, but not limited to, answers to previous questions.)

Printed Resources Used:	Internet Resources Used:

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Key Ideas

Topic: _____

Group Members: _____

Idea	Presenter	Visual Aid (Image, Slide, Diagram, etc.)

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Report References

Internet References:

1.

2.

3.

4.

Printed Resources:

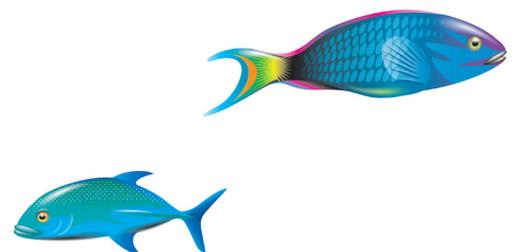
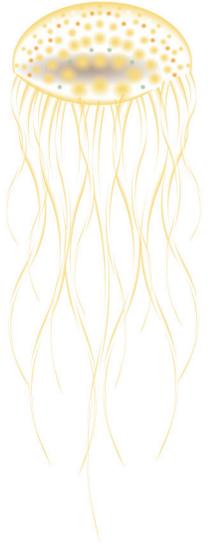
1.

2.

3.

4.

Other:



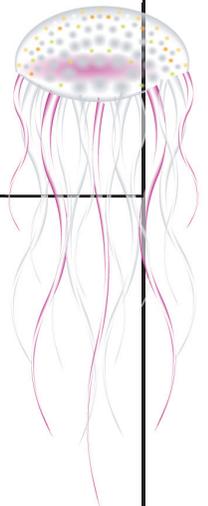
CULMINATING LESSON

Recalling Key Ideas

Topic: _____

Presenters: _____



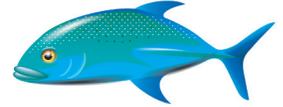


CULMINATING LESSON

Benchmark Self-Assessment Checklist

Name: _____ Date: _____

Check the appropriate column with an X below.



Benchmark	Expectation	Advanced	Proficient	Partially Proficient	Novice	Evidence (list where someone could find evidence of your meeting the expectation.)
SC 5.3.2	I can describe the interdependent relationships among producers, consumers, and decomposers in a wetland ecosystem in terms of the cycle of matter.					
LA 5.6.1	I can use speaking and listening skills to fill a prescribed role in group activities.					
LA 5.6.2	I can give informal presentations or reports to inform.					
LA 5.6.3	I can recall oral messages by noting key ideas and relating them to the speaker's purpose.					

Reflections:

Explain how you did during the research and presentation activity. What went well? What needs improvement?
List some things that you learned by listening to other students' presentations.

