4H346

Aquatic and Marine Ecosystems

Leader's Activity Guide

UF | IFAS Extension UNIVERSITY of FLORIDA

Sea Grant Florida

This page is left blank on purpose.

Aquatic and Marine Ecosystems

Leader's Activity Guide

UF | IFAS Extension
UNIVERSITY of FLORIDA

Sea Grant Florida

CREDITS AND ACKNOWLEDGMENTS

The original **Aquatic/Marine Ecosystems Leader's Activity Guide** was developed in the spring of 1998 by the Department of Family, Youth and Community Sciences and the Florida 4-H Youth Development Program, Institute of Food and Agricultural Sciences, University of Florida. The original curriculum was created by Dr. Jerry Culen, Assistant Professor and 4-H Youth Development Specialist, Department of Family, Youth and Community Sciences, and the following Project Assistants/Writers, Elise Cassie, Tammy Cushing, Wendy Flanagan, and Mike Harrington. Additional editorial and design layout assistance was provided by Karen Stetson, Program Assistant, 4-H Youth Development Office. Special thanks to Jeanie Slade for additional artwork included in selected activities.

Original technical review and assistance for the curriculum was provided by Robert A. Mattson, Biologist with the Suwannee River Water Management District and the following members of the Cooperative Extension Service Environmental Education Design Team (FL714): Joe Halusky, Sea Grant Agent; Sonya Wood, Sea Grant Agent; Bryant Diersing, 4-H Agent Monroe County; additional assistance was also provided by Bill Mahan, County Extension Director and Sea Grant Agent, and Nancy Peterson, Center for Natural Resources. The 4-H Youth Development Program also acknowledges the U.S. Sugar Corporation for its support in underwriting the cost and development of the original curriculum.

This second version of the **Aquatic/Marine Ecosystems Leader's Activity Guide** was initiated in 2011 by Dr. Joy Jordan, former 4-H Curriculum specialist, now retired. The revision process was continued and completed by Karen Blyler, State 4-H Science Coordinator in the fall of 2013. Additional review and editorial assistance was provided by Dr. Maia McGuire and Chris Verlinde of the Florida Sea Grant Program. Additional editorial and layout assistance was provided by Katie Profeta, a graduate student at the University of Florida. The revision of this curriculum was made possible by a grant from the Florida Sea Program.

Photographs: The 4-H Program gratefully acknowledges and thanks those 4-H members whose photographic works appear on many pages of the curriculum.

TABLE OF CONTENTS

INTRODUCTION

LESSON 1 AQUATIC/MARINE ECOSYSTEM CONNECTIONS

Lesson 1 is designed to be a primer for the Aquatic/Marine Leader's Activity Guide. It is suggested that anyone using this guide begin with Lesson 1 and complete all eight activities. The concepts presented here will help set the stage for the remainder of the lessons which are related to specific ecosystems. After completing Lesson 1, the remaining four lessons can be randomly selected depending on the interest of the participants and/or the location relative to the ecosystems under study.

Participants will use maps to locate Florida's aquatic/marine ecosystems and learn how they are related.

Discovering how fish respond to fresh and salt water.

Learning how water cycles.

Distinguishing between nonliving and living components of an ecosystem.

Sampling from a local ecosystem and learning about its energy flow.

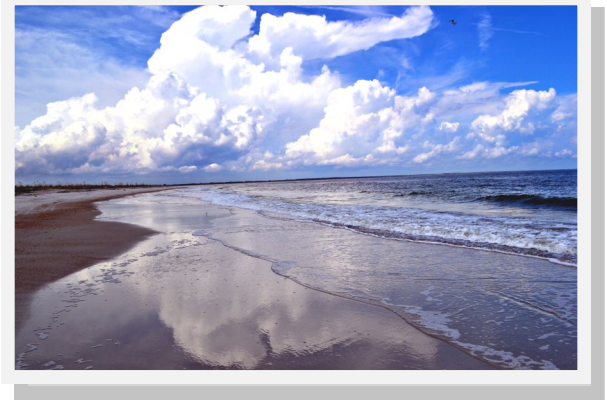
INTRODUCTION TO THE AQUATIC AND MARINE ECOSYSTEMS CURRICULUM

Leader's Activity Guide

The new Florida 4-H Aquatic/Marine Ecosystems Leader's Activity Guide helps leaders address the 4-H Science Initiative and is part of the Environmental Sciences Framework, OUR NATURAL WORLD. This framework includes the basic premise that aquatic/marine environments are important in children's lives, particularly to those children in Florida. The 4-H Aquatic and Marine Ecosystems curriculum provides an opportunity for young people to practice a variety of life skills while learning marine science concepts. The curriculum also utilizes science inquiry as a way for young people to gain a deeper curiosity about the natural world.

The Aquatic and Marine Ecosystems Leader's Activity Guide is designed to help 9-14 year old children understand the role freshwater and marine environments play in our lives and how we as individuals might become better stewards of these environments. Additional curriculum packages are being designed for youth in other age ranges for sequential advancement in the area of aquatic, marine, and environmental sciences. The following page identifies those subject areas included in 4-H's Environmental Science curricula and form the core of "Our Natural World."

To the informed Florida citizen, it is not surprising that educational activities related to the aquatic and marine studies commands a priority within the total Florida 4-H education curriculum. An investment in young people's knowledge, understanding and attitudes about these topics will certainly produce a citizen that is better prepared for the decisions of tomorrow.



4-H ENVIRONMENTAL SCIENCES CURRICULA AREAS

Using the Curriculum

The development of this 4-H Activity Guide was driven by two basic principles:

- Learning about the environment can be fun! This leader's guide provides fun, interactive, and educational activities that teach youth about ecological concepts related to Florida's aquatic/ marine ecosystems and fosters ocean literacy. In addition, the activities in this guide promote the concept of good stewardship in the use and management of these valuable natural resources.

- 4-H volunteer teaching activities must be ready-to-use. This activity guide includes projects, experiments, games, and activity sheets needed to conduct activities in an easy-to-use format. It was designed to be teacher friendly and takes much of the guesswork out of teaching this subject.

Age or Grade Levels

This project was developed for youth ages 9-14. Both group and individual activities encourage participation and action in all aspects of this program. Because of the large age range, teachers and volunteers are encouraged to select learning activities that are most suitable to their youth, as some activities are more advanced than others. Youths' individual experiences and grade level should be considered when selecting activities. The overall intent is to facilitate learning and to spark creativity in both teachers and youth.

Components

The following are components of the AQUATIC/MARINE ECOSYSTEMS LEADER'S ACTIVITY GUIDE:

- LESSON INTRODUCTION/BACKGROUND BASICS - This three-ring notebook contains five complete lessons that provide background information for the leader/teacher and help organize activities for the participants. Each lesson is prefaced with a lesson outline and the BACKGROUND BASICS that help you focus on the overall concepts and desired outcomes. Also, to help the leader/teacher, important concepts or critical vocabulary words are in bold and followed by a definition. With this information the leader/teacher can use the lesson as a unit of study or select activities to supplement other curricula. The lesson activities can be adapted and conducted according to needs of the participants and time frame devoted to this project

- LESSON ACTIVITIES - The activities provided in each lesson are specifically designed to guide the learner through specific concepts related to the lesson topic. Objectives for each activity are listed in

the activity organizer section along with a materials list, time limitations, setting description, and a list of any advance preparation needed by the leader. Each activity provides an introduction for the participant and a “Do” section. The activity then concludes with discussion questions or suggestions for youth to REFLECT and APPLY the knowledge and skills they have gained. Creative projects, experiments, role playing, and competitions are just a few of the activities found in the leader's guide.

- STUDENT PAGES FOR DUPLICATION - All youth activity pages or handouts (e.g., word search sheets, worksheets, and diagrams) are contained in this section. These pages are provided for the leader/ facilitator to easily access these materials for duplication purposes. Permission to copy these pages for educational purposes related to the use of this guide is granted. All pages are single sided and should produce a clean clear image when copied. Note: duplicates of these pages along with the answer sheets are included with each corresponding activity.

- REFERENCES AND RESOURCES - This section is provided at the end of the guide. The lists contains a number of publications that were used in the production of the curriculum and additional resources that might be helpful to educators and 4-H leaders. Several of the field guides can be used during ecosystem exploration activities and should prove invaluable to the serious naturalist.

- EVALUATION TOOL - A FACILITATORS EVALUATION is provided at the end of the document to allow you to provide us with feedback about activities in this project. We welcome suggestions and urge you to return this form after you have explored a lesson or two. Simply return the completed evaluation to the address at the bottom of the form.

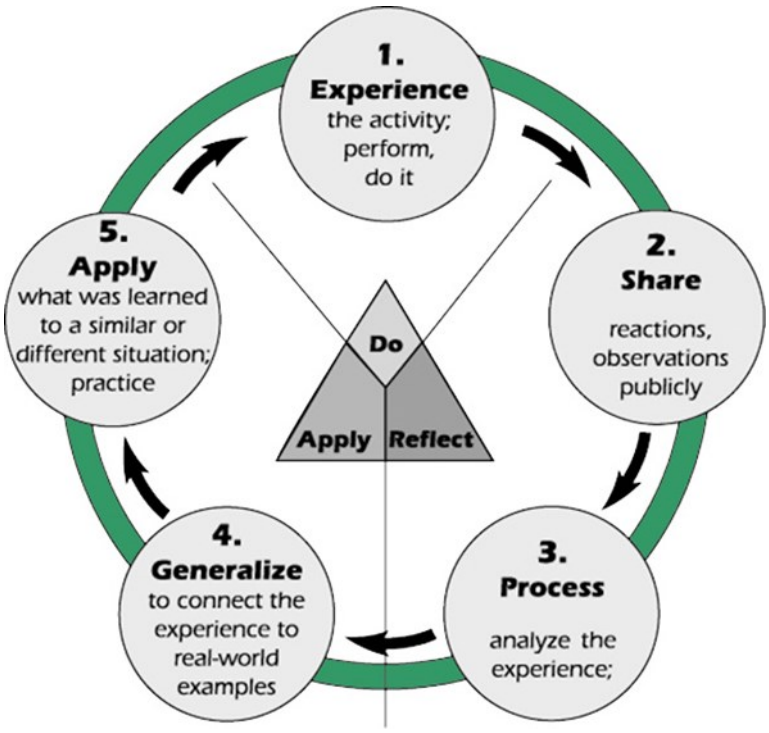
The Experiential Process...Steps and Strategies

The 4-H Program has a long history of providing for a cooperative teaching-learning process between adults and youth. The activities in each project lesson strive to involve young people in experiences that require them to interact, analyze, question, reflect and transfer what they have learned to personal application. The activity comes first, the "learning" comes from the "discovery" of new knowledge and skills as a result of the experience. This is the 4-H "learn-by-doing" process. However, to end with the experience without building upon it through REFLECTING and APPLYING does not help the young person understand the significance of what he/she saw, heard, or did. It is the transfer of this significance from one experience to another that helps young people apply their "learning" in future situations. *(See figure below. Source* - www.4-h.org*)*

DO Each lesson topic identifies the activity or series of activities to **DO** involving youth in a common experience.

REFLECT At the conclusion of each activity, allow time for youth to **REFLECT** (share and process) what they learned from the experience. Each lesson guide outlines some key questions to assist you in the process.

APPLY Help you to **APPLY** their new knowledge and skill to real life situations. You can do this by helping them to identify key principles that are important for future decisions or personal action. Again, each lesson has outlined a few questions to direct the process.



STEPS

The **experiential learning model** illustrates the cooperative teaching-learning process that is the goal of 4-H curricula. A further description of the steps in the process may be helpful as you become an active participant in *AQUATIC/MARINE ECOSYSTEMS!*

Experience - Begin with concrete experience. This can be an individual activity or a group experience, but it involves "doing something." The learning experience will most likely take place when the experience is unfamiliar or a first-time activity for the learner; pushes the learner beyond any previous performance levels; is uncomfortable; and includes the risk of failure.

Share - Next, get the participant(s) to talk about the experience. Share reactions and observations. Let the group talk freely. Acknowledge ideas; listing them visually is helpful. Allow time for volunteers to share responses. Encourage group members to answer questions posed by others. Avoid having the leader answer questions.

Process - Discuss how themes, problems and issues are brought out by the exercise. Speak to specific problems and issues that the group discovers from the exercise or recalls from personal experiences. Look for recurring themes and write them on the newsprint. Have small groups discuss and report back, have a panel discussion, or generate ideas individually on 3" x 5" cards.

Generalize - Find general trends or common truths in the experience. Draw out and identify the principles that are important - that apply to "real life," not just the activity. This focuses on the key messages. Try to list key terms that capture the lessons. Identify situations where the principles apply.

Apply - Concentrate on how the new learning can be applied to everyday situations. Discuss how issues raised by this activity can be useful in the future. Describe how more effective behaviors can grow out of what is learned. Write personal goals for behavior changes, take turns solving problem situations in groups of two or three, or role-play situations that show how new behavior is learned. Each individual should feel a sense of ownership for what is learned.

Suggested Strategies and Approaches

Use a Variety of Activities

You might consider any one or a combination of the following: tours, interviews, judging, games, pantomimes, skits, puzzles, demonstrations, problems to solve, experiments, using a specific tool, systematic observations, creating a product, visualization, brainstorming, group initiatives, case studies, simulations, surveys leading to an event or activity, or sharing and presenting to others through talks and exhibits.

Develop Questions to Ask

The types of questions asked will vary with the activity, some questions may relate to the content but must go beyond it. If a specific life skill is to be enhanced, then the youth should have the opportunity to become as involved with understanding the life skill as understanding the subject related skill. Questions to help move in this direction may be as straightforward as these examples:

Sharing Questions

1. What did you do?
2. What happened?
3. How did you feel? Or how did it feel to…?
4. What was the most difficult? What was the easiest?

Processing Questions (Use date generated from sharing questions)

1. What problems or issues seemed to occur over and over?
2. What similar experiences have you had?

Generalizing Questions

1. What did you learn about yourself through this activity?
2. What did you learn about (life skill, i.e., making decisions)?
3. How do the major themes or ideas relate to real life and not just the activity?
4. How did you go about making your decision?

Applying Questions

1. How can you apply what you learned (making decisions) to a new situation?
2. How will the issues raised by this activity be useful in the future?
3. How will you act differently in the future as a result of this activity?

Each of these general questions could be enhanced by adding specific language referring to the experience in a particular project.