

# 4-H

## Marine Biology and Oceanography

### Proficiency Program

### A Member's Guide

#### OVERVIEW

The 4-H Marine Biology and Oceanography Proficiency program helps you learn what you need to know about your 4-H Marine Biology and Oceanography project.

Through this project, you will learn the basic concepts of oceanography – dealing with tides and current, ocean biology, ocean food webs and transfer of energy. You will explore the identity of marine plants and animals and their habits. You will practice principles for beach and water safety.

There are many resources to help you learn more about your project:

- ❖ The 4-H Publications Catalog lists a variety of project materials and resources recommended for use in your project.
- ❖ The 4-H Educational Resources Lending Library at your county 4-H office includes other books, videos and reference materials that can be checked out by members and leaders.
- ❖ Local junior college and universities may offer classes in marine biology or oceanography and experts who may be able to come speak to your group. Don't hesitate to visit or telephone them for more information.

There are five levels in the Project Proficiency Program. You may choose how many levels you wish to complete.

- ❖ Level I - "Explorer", you begin to learn about many different aspects of Marine Biology and Oceanography.
- ❖ Level II - "Producer", you learn more about marine life, ecosystems and the ocean.
- ❖ Level III - "Consumer", you become experienced in many aspects of Marine Biology and Oceanography.
- ❖ Level IV - "Leader", allows you to show your own leadership potential.
- ❖ Level V - "Researcher", you carry out a demonstration or experiment on some aspect of Marine Biology and Oceanography, and prepare a paper or portfolio.

As you work through the Marine Biology and Oceanography proficiency program, have your leader initial and date each skill item when you have completed it. When you have finished all items in a proficiency level, have your leader sign the Certificate of Achievement and order a medal for you from the 4-H office.

# MARINE BIOLOGY AND OCEANOGRAPHY

## Level I – Explorer

Date \_\_\_\_\_  
Completed \_\_\_\_\_

- \_\_\_\_\_ 1. Explain seven beach safety tips and practice them at the beach.
- \_\_\_\_\_ 2. Identify five species of marine mammals and describe where they can be found.
- \_\_\_\_\_ 3. Describe the marine food web.
- \_\_\_\_\_ 4. Identify the parts of a wave and describe how waves affect sea life.
- \_\_\_\_\_ 5. Define: phytoplankton, zooplankton, estuary, wetlands, algae, crustacean, invertebrate, mammal, mollusk, ecology,
- \_\_\_\_\_ 6. Explain the influence of the moon and the sun on tides.
- \_\_\_\_\_ 7. Collect and identify ten seashells and explain how a seashell is formed.
- \_\_\_\_\_ 8. Identify five intertidal animals and three intertidal plants.
- \_\_\_\_\_ 9. Describe the regulations which protect marine plants and animals that live in the ocean, intertidal zone, wetlands, estuaries, dunes and marshes.
- \_\_\_\_\_ 10. Complete an art project using some aspect of your project such as shell collage, sand painting, beach casting, fish print or rubbing, etc.
- \_\_\_\_\_ 11. Identify seven marine birds and describe the differences in their bills, feet and wings. Record when and where each was sighted. Share this information with other members.
- \_\_\_\_\_ 12. Find six examples of pollution in marine areas. Explain how each could be prevented.
- \_\_\_\_\_ 13. Collect samples of, and explain the differences between sand particles found on two different beaches.
- \_\_\_\_\_ 14. Identify five wildflowers found in sand dunes and five wildflowers found in salt marshes. Record when and where each was sighted. Share this information with other project members.
- \_\_\_\_\_ 15. Identify the parts of a fish from a diagram or live example and explain the functions of the fins and the scales.
- \_\_\_\_\_ 16. Define hypothermia and demonstrate the H.E.L.P. and Huddle positions.

Member Name: \_\_\_\_\_

Date: \_\_\_\_\_

Project Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**KEEP IN YOUR RECORD BOOK WITH YOUR PROJECT RECORDS.**

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# MARINE BIOLOGY AND OCEANOGRAPHY

## Level II – Producer

Date Completed \_\_\_\_\_

- \_\_\_\_\_ 1. Describe ten ways we can keep our oceans, beaches, rivers and land as close to nature as possible.
- \_\_\_\_\_ 2. Explain the importance of estuaries to marine life.
- \_\_\_\_\_ 3. Name describe four dangerous marine animals and explain why they may be dangerous.
- \_\_\_\_\_ 4. Assemble a beach safety kit.
- \_\_\_\_\_ 5. Visit an established operation or expert in the field (such as a commercial fishing vessel, cannery, biologist, etc.) and learn what they do and how they do it.
- \_\_\_\_\_ 6. Describe the function of dunes.
- \_\_\_\_\_ 7. Using your local news media, identify a policy issue related to your project and explain its significance to another person.
- \_\_\_\_\_ 8. Explain El Niño and describe how it affects the seafood industry.
- \_\_\_\_\_ 9. Participate in a project related cleanup activity.
- \_\_\_\_\_ 10. List five causes of boating accidents and explain how they can be avoided.
- \_\_\_\_\_ 11. Explain upwelling and its effect on climate and marine life.
- \_\_\_\_\_ 12. Collect and identify three different phytoplankton and three different zooplankton and explain how they are different.
- \_\_\_\_\_ 13. Make a collage of photographs or drawings illustrating man's use of the marine environment and display it at a local fair, county 4-H event or similar public event.
- \_\_\_\_\_ 14. Prepare one food dish from fresh fish and one food dish from marine algae.
- \_\_\_\_\_ 15. Name five types of fish and/or shellfish produced by aquaculture.
- \_\_\_\_\_ 16. Identify and describe three different types of fishing vessels and three different types of fish harvesting gear. Explain which vessel uses which gear to harvest which fish.
- \_\_\_\_\_ 17. Identify three types of ropes and five knots used in the industry. Compare their relative strengths and where/how each might be used.
- \_\_\_\_\_ 18. Determine the age of three fish samples by collecting and analyzing their scales.
- \_\_\_\_\_ 19. Collect, press and mount three different algae and describe their physical characteristics.

Member Name: \_\_\_\_\_

Date: \_\_\_\_\_

Project Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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# MARINE BIOLOGY AND OCEANOGRAPHY

## Level III – Consumer

Date \_\_\_\_\_  
Completed \_\_\_\_\_

- \_\_\_\_\_ 1. Design, construct, rig and use one item for this project, such as a seine net, plankton net, poke pole, crayfish pot, etc.
- \_\_\_\_\_ 2. Explain how seafood gets from the sea to the dinner table. Explain the career options in the various marketing channels.
- \_\_\_\_\_ 3. Explain fishing license regulations.
- \_\_\_\_\_ 4. Describe two commercial uses of marine algae
- \_\_\_\_\_ 5. Describe the quality characteristics you would look for when purchasing fresh and frozen seafood.
- \_\_\_\_\_ 6. Name and describe five marine careers and required qualifications. Identify five potential ocean related summer jobs.
- \_\_\_\_\_ 7. Contact a local, state or national association related to your project and determine what this association has to offer its membership.
- \_\_\_\_\_ 8. Invite a commercial fisherman or industry representative to discuss a local policy issue with your project group or club. Introduce the speaker to your group.
- \_\_\_\_\_ 9. Give three examples of Native American historical use of marine resources and explain how they collected and prepared each item.
- \_\_\_\_\_ 10. Compare the food habits of two species of fish by analyzing their stomach contents.
- \_\_\_\_\_ 11. Demonstrate how to preserve fish utilizing two different methods.
- \_\_\_\_\_ 12. Diagram the major currents of the North Pacific Ocean.
- \_\_\_\_\_ 13. Record and analyze the distribution of one organism across the intertidal zone.
- \_\_\_\_\_ 14. Describe the lifecycle/history of one marine mammal.
- \_\_\_\_\_ 15. Keep a personal reference library of literature that will be helpful in your project.
- \_\_\_\_\_ 16. Assist with a marine habitat improvement project.
- \_\_\_\_\_ 17. Prepare a marine educational display for a local or county event.

Member Name: \_\_\_\_\_ Date: \_\_\_\_\_

Project Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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# MARINE BIOLOGY AND OCEANOGRAPHY

## Level IV – Leader

Date \_\_\_\_\_  
Completed \_\_\_\_\_

- \_\_\_\_\_ 1. Explore and sample one recreational use of the marine land such as sailing, scuba diving, sand castle building, wind surfing, boating, fishing, etc.
- \_\_\_\_\_ 2. Select one species of marine life such as whale, shark, crab, etc. name and describe ten varieties of that species and describe habitat, eating habits, migratory habits and reproductive habits of the species.
- \_\_\_\_\_ 3. Serve as a Junior or teen leader in this project for one year.
- \_\_\_\_\_ 4. Assist younger members in designing and constructing needed equipment.
- \_\_\_\_\_ 5. Prepare teaching materials for use at a project meeting.
- \_\_\_\_\_ 6. Develop and put on a demonstration or judging event or train a junior team for an event.
- \_\_\_\_\_ 7. Speak on a project-based subject before an organization other than your 4-H group.
- \_\_\_\_\_ 8. Assist younger members in actually learning a specific topic in the project.
- \_\_\_\_\_ 9. Develop your own special project related activity. Chart your progress, plan the activities, analyze successes and problems, and report on findings.
- \_\_\_\_\_ 10. Organize or participate in a public forum discussion/debate on a local, state, national or global issue related to your project.
- \_\_\_\_\_ 11. Assist a local organization with a marine research project.

Member Name: \_\_\_\_\_

Date: \_\_\_\_\_

Project Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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# MARINE BIOLOGY AND OCEANOGRAPHY

## Level V – Researcher

Date \_\_\_\_\_  
Completed \_\_\_\_\_

- \_\_\_\_\_ 1. Report on the results of a demonstration comparing measurable difference in some aspect of your project.
- \_\_\_\_\_ 2. Prepare a paper of 300 words or more on one of the following topics:
- Commercial markets and methods of marketing
  - Global fishing policies and problems
  - The effects of temperature and light on marine organisms
  - Ocean currents
  - marine mammals
  - Aquaculture
  - History of the whaling industry
  - Wetland species
  - Local marine land pollution
  - Other
- \_\_\_\_\_ 3. Prepare a speech or illustrated talk to orally summarize your findings and present at a club, project meeting or other educational event.

Member's Name: \_\_\_\_\_

Date: \_\_\_\_\_

Project Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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# Certificate of Achievement

*This certifies that*

*has completed the* \_\_\_\_\_ *Proficiency*

*in* \_\_\_\_\_ *County.*

**Explorer**

**Producer**

**Consumer**

**Leader**

**Researcher**

\_\_\_\_\_  
**Date**

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Leader's Signature

## ***NOTES***



**Adapted from DNAR North Region  
Publication No. NR-PP-001**

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