

UC
CE

Marine Biology



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This We Believe:

- The boy and girl are more important than the projects.
- The member should be their own best product.
- No award is worth sacrificing the reputation of a member or leader.
- Competition is a natural human trait and should be recognized as such. It should be given no more emphasis than other fundamentals.
- Learning how to do the project is more important than the project itself.
- Many things are caught rather than taught.
- A blue ribbon member with a red ribbon project is more desirable than a red ribbon member with a blue ribbon project.
- To learn by doing is fundamental in any sound educational program.
- Generally speaking, there is more than one good way of doing most things.
- Every member needs to be noticed, to feel important, to win, and to be praised.
- Our job is to teach members *how* to think, not what to think.

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, mullusk, 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.

Approved by Lake County 4-H Council, 1999

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

Date

Producer

Date

Consumer

Date

Leader

Date

Researcher

Date

Leader's Signature

Leader's Signature

Leader's Signature

Leader's Signature

Leader's Signature

NOTES

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MARINE BIOLORY

Sonoma County 4-H

Name: _____ Date: _____

Guidelines for Project Proficiency Award

Beginner:

Date
Completed

Leader's
Initials

HEAD:

1. Identify 4 tidal zones and explain differences of each.
(Characteristics). _____
2. Define indicator species of identify two for each tidal zone. _____
3. Identify/discuss these terms: high tide, spring tide, low tide, neap tide, continental shelf, continental slope. _____
4. Explain/diagram tides and the cause of them. _____
5. Understand the differences between these habitats; rocky, sandy piling and estuary. _____

HEART:

1. Attend a low tide field trip. _____
2. Understand and discuss grey whale migration. _____
3. Identify and give 2 characteristics of 3 other species of whales. _____
4. Explain and give examples of why oceans are important to man. _____

HANDS:

1. Discuss how organisms have adapted to survive repeated exposure to the air and sun. _____
2. In a tidal pool, locate and identify 5 common inhabitants. _____
3. Understand causes and explain the differences in salinity of tidal pools, open ocean, estuary. _____
4. Be able to read and understand a tide table book. _____

HEALTH:

1. Identify "red tide", discuss what causes it, and explain its effects on man. _____
2. Discuss how oceans can become polluted, give 2 examples, and explain how ocean pollution affects all life. _____
3. Define "feeding frenzy". _____
4. Give a demonstration at County Presentation Day. _____

Project Leader's Signature of Completion: _____

Date: _____

Club Leader's Signature of Completion: _____

Date: _____

MARINE BIOLOGY

Sonoma County 4-H

Name: _____ Date: _____

Guidelines for Project Proficiency Award

Intermediate:

<u>Date</u>	<u>Leader's</u>
<u>Completed</u>	<u>Initials</u>

HEAD:

1. Compare and contrast the life cycles of salmon and steelhead.
2. Define; benthic, current, trench, sea mount, swell, sea level, tsunami.
3. Identify and discuss the importance of the "holdfast" to the sea palm.
4. Identify and describe 2 marine mammals (other than the whale).
5. Explain the differences between marine mammals and fish.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

HEART:

1. Attend a whale watching field trip.
2. Adopt a whale.
3. Define; ecosystem, niche, commensal, parasitic, symbiotic.
4. Understand the differences between phytoplankton and zooplankton, and give examples of each.
5. Discuss the importance of plankton, where it is the most abundant, and why it is important to the world's ecosystem.

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HANDS:

1. Identify 3 seaweeds and discuss their importance to the ecosystem and to man.
2. Define "food chain", give 5 examples and be able to draw a diagram of one.
3. Cook and eat some fish or seaweed.
4. Explain predator and prey and discuss why both are necessary for a functioning ecosystem.

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Project Leader's Signature of Completion: _____

Date: _____

Club Leader's Signature of Completion: _____

Date: _____

MARINE BIOLOGY

Guidelines for Project Proficiency Award

Intermediate:

HEALTH:

1. Define and discuss the importance and necessity of biodiversity. _____
2. Explain the difference in the oxygen level in both warm and cold water, and discuss what effects this has on marine organisms. _____
3. Define buoyancy and explain the difference in buoyancy in warm and cold water. _____
4. Give a demonstration at County Presentation Day. _____

Leader's Signature of Completion: _____

Date: _____

MARINE BIOLOGY

Sonoma County 4-H

Name: _____ Date: _____

Guidelines for Project Proficiency Award

Advanced:

<u>Date</u> <u>Completed</u>	<u>Leader's</u> <u>Initials</u>
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HEAD:

1. Describe the coloration found on many open ocean fish, and discuss why they have adapted to this coloration.
2. Identify eels, and describe their life cycle.
3. Describe how a sea anemone gets its food. Identify 2 common sea anemones.
4. Describe 3 methods organisms can use to protect themselves.

_____	_____
_____	_____
_____	_____
_____	_____

HEART:

1. Discuss the relationship between the sea otter and man.
2. Describe two uses man has found for seaweed.
3. Visit an aquarium.
4. Describe the requirements necessary for a productive environment for open ocean dwellers.
5. Describe 3 mechanisms that deep water creatures use to survive.
6. Explain how and why aquariums are used to provide the public with information.

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_____	_____
_____	_____
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_____	_____
_____	_____

HANDS:

1. Eat some seaweed.
2. Describe waves and how they move.
3. Make a collection of shells and identify them.
4. Identify the radula on some shells and discuss its importance and purpose.
5. Identify 3 types of coral and explain the importance of coral reefs to man.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

HEALTH:

1. List several safety rules used to lessen the danger of shark attack.
2. Identify 3 poisonous ocean organisms, describe characteristics and where they may be found.
3. Explore in depth one area of marine biology that especially interests you.
4. Give a demonstration at County Presentation Day.

_____	_____
_____	_____
_____	_____
_____	_____

Project Leader's Signature of Completion: _____

Date: _____

Club Leader's Signature of Completion: _____

Date: _____

I'm a 4-H Project Leader: Now What Do I Do?

How do I know who is in my project?

- Your club organizational leader will provide you with the names, addresses and phone numbers of the members enrolled in the project for which you are the leader.
- If you are working on the county level, contact the UCCE for the list of project members.
- The organizational leader may indicate to you if any of the youth have special needs. At your first project meeting, note any other youth that may have special needs.
- You may wish to consult with the parent or your 4-H Youth Development Agent as to how to work with a special needs child.

How often should I hold project meetings?

It is recommended you hold 4-6 meetings that each last 1½ to 2 hours in length. Some projects require more meetings or a longer meeting time to accomplish your goals. Some projects, such as leather craft, may lend themselves to individual project work as members progress on their projects. In this case, you should hold several introductory meetings for all members and then set up a schedule of time for them to sign up for individual help.

When do I start?

Get started as soon as possible! Members' interest in a project is most keen when they are signing up for a project and when they get their project books.

How do I cover the cost of project meetings?

- There is a wide variety of means for covering the cost of project meetings. Some methods used include:
- Each member pays for their share of the expenses or provides a portion of the supplies.
- The club agrees to cover expenses using funds from their treasury. Approval in advance is needed for this.
- Members and leaders can solicit donations/supplies from area businesses.
- Sometimes funds from sources outside your club may be available to cover your project meeting costs.

How do I establish a project meeting schedule?

First, determine when you are available to work with project members. Then determine an initial project meeting date by consulting with your project members.

Publicize the date using one of the following means:

- County and/or club newsletter
- Club meeting or leader association meetings
- Postcards or phone calls to project members

You may not be able to schedule an initial meeting that everyone can attend. Establish a time to meet with those unable to attend before you hold your second project meeting.

Where do I hold project meetings?

Typically project meetings are held at project leader homes, schools, or community buildings. For more information on facility adaptability and liability concerns contact your 4-H Youth Development Agent.

What safety precautions do we need to consider?

Consider the type of safety issues your particular project involves. Request and secure necessary safety items such as ear protection, eye protection and head protection.

How do I let others in my club or other clubs know I am a project leader?

Prior to enrollment ask for time on your club's meeting agenda to let families in your club know you're a project leader and to share some things the kids could do in the project if they enrolled in it. When the project materials are handed out, take the opportunity to inform or remind members that you are their project leader and set an initial meeting date with the group. If no one in your club is in your project, you may wish to offer your services to a neighboring club. Talk to your club organizational leader or county 4-H Youth Development agent about this opportunity.

How do I prepare for the first meeting?

You may want to establish a 4-H resource box where you keep your project materials and any additional resources you will be using. Take time to become familiar with your project literature and talk to others who were project leaders for this project to find out what activities the members enjoyed.

What should I do at the initial project meeting?

- At the initial project meeting, here are some ideas of what you might want to cover:
- Find out what the members want to learn and accomplish in the project. The project literature is an excellent source of ideas.
- Review the safety practices that members will need to follow.

- Do an introductory activity related to the project so the members get to know one another
- Have a small project the members can complete and take home
- Talk about how the project meeting supplies will be paid for. Experienced leaders have found it easiest to charge a small fee to cover the cost of the expenses.
- Assess when members are available for additional meetings. You may wish to ask the parents or members to bring along their calendars of family activities.
- Encourage parents to participate in project meetings, especially the initial meeting.

What does a typical project meeting look like after the initial orientation?

Use the experiential learning model (found in the introductory pages of your Helper's Guide) to plan your project meeting. The project helper's guide will provide suggestions for designing a project meeting. Here are some suggestions for each section of the model:

Do

- Plan an activity to focus the project members on what they'll be doing today. Work on the project for that meeting.

Reflect

- Review the process completed
- Discuss what worked and didn't work.
- Talk about how any problems that arose were solved.
- Assist members in documenting their project work for inclusion in their record books/portfolios.

Apply

- Ask the project member the following questions:
- What else have you seen that is similar to this?
- How can you apply what you learned today to other situations?

What resources are available to help me?

- 4-H Project Literature – You will receive project literature through your 4-H club or the UW-Extension office. Typically there is a helper's guide and member literature for three to four levels.
- Other People in my Club & County – There are a number of people in your county who would be willing to share project ideas and tips with you.

These include:

- Project leaders in other clubs
 - County Staff
 - Older youth who have been involved in the project
-
- Media Collection & Public Libraries – Additional resources can be obtained from the Cooperative Extension Media Collection. They have videos, skillathons, displays and resource packages available to support a variety of projects. There is a user fee per item you or your club will be responsible for. You can view their catalog at their website <http://www.uwex.edu/ces/media/>. Check with your local public library to find out what resources they may have or that you can obtain through inter-library loan.
 - 4-H Website – Wisconsin 4-H is continually adding more information and activities to their website. Visit this site at www.uwex.edu/ces/4h/onlinepro/. You may wish to check out websites from other state 4-H programs also.
 - Volunteer Leaders Conferences – Review each issue of your county's newsletter to learn about training sessions for project leaders offered by your county, district or at statewide events. Sessions focusing on new project literature are typically offered at the State 4-H Volunteer Leader Conference held every other year. Periodically statewide conferences focusing on specific project areas are offered in addition to sessions at the volunteer conferences. You can also exchange ideas with other leaders at statewide Field Day.
 - Field Trips – Youth always enjoy the opportunity to see firsthand how things are done and how they work. Consider taking your project group on a field trip or tour of a local business or company to enhance their project experience. An example would be taking your dairy members to a cheese factory or your foods group to a local bakery.
 - Local Experts – Bring in a local "expert" to share their ideas and experiences with your group. One example would be asking a Master Gardener to share information on choosing perennial or trimming shrubs at one of your project meetings.
 - Magazines – Many leaders have found creative ideas to supplement those in the project literature in magazines they have or those at the public library.

How can I incorporate activities not included in the project guide?

We encourage you to use the ideas in the project literature as they have been successfully used with youth. If you have some additional activities you would like to incorporate, consider the following criteria:

- Of interest to kids
- Developmentally appropriate
- Incorporate the experiential learning model
- Youth and adults are involved in determining what will be done
- Enhances the development of member life and project skills
- Research based source of content utilized

What is the relationship between project work and the county fair?

The County Fair is an opportunity for an independent evaluation of life and project skills a member learned through completing a project. County fair entries typically match the activities included in the project literature and may include other activities that are being emphasized in your county. One of your roles is to help maintain the focus of members and parents on the goal of 4-H, which is to develop blue ribbon kids. Talk with members about what they learned about each of their fair entries from the judging process. Help members celebrate their accomplishments regardless of the color of ribbon each project member received at the fair. This may be done through individual encouragement or at a meeting following the fair. While entering and displaying a project at the County Fair is the traditional method of public affirmation, there may be other means of exhibition such as a club tour, open house, community celebrations or others.

Who can I go to if I need someone to help me during the project meetings?

If you are leading beginning level project meetings, ask older members in the project to help you. This is a great leadership experience for them! Parents are another excellent source of help. Don't hesitate to ask them to stay for the meeting and be actively involved in their child's project work.