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

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

- The University of California Davis has free resources available online by visiting: http://anrcatalog.ucdavis.edu/4HYouthDevelopment/ This site lists a variety of project materials and resources recommended for use in your project.
- The Tehama County 4-H Resources and Lending Library at our 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 and experts who may be able to come speak to your group. Don't hesitate to visit of telephone them for more information.

There are five levels in the Project Proficiency Program. You may choose how many levels you with 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 proficiency program, your leader will date each skill item as you complete it. When all items in a proficiency level are completed, you leader will sign the Certificate of Achievement.

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 the following:
   - Phytoplankton
   - Zooplankton
   - Estuary
   - Mollusk
   - Ecology
   - Wetlands
   - Algae
   - Crustacean
   - Invertebrate
   - mammal
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.
17. Identify four tidal zones and explain differences in each.
18. Define indicator species and identify two for each tidal zone.

19. Explain/diagram the following terms:

- High tide
- Low tide
- Continental shelf
- Spring tide
- Neap tide
- Continental slope

20. Understand the differences between these habitats: rocky, sandy, piling, and estuary.

Member Name: _____ Date: _____

Project Leader's Signature: _____ Date: _____

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 and describe four dangerous marine mammals 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 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: _____

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 marine biology 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.
_____	18.	Explain the difference between marine animals and fish.

Member Name: _____ Date: _____

Project Leader's Signature: _____ Date: _____

MARINE BIOLOGY AND OCEANOGRAPHY
Level IV - Leader

Date Completed		
_____	1.	Serve as Junior or Teen leader in this project for one year.
_____	2.	Prepare teaching materials for use at project meetings.
_____	3.	Assist younger members in designing, selecting, or constructing something for your project.
_____	4.	Develop and put on a judging event or train a junior team for a judging event.
_____	5.	Speak on a project-related subject before an organization other than your 4-H group.
_____	6.	Explore and sample one recreational use of the marine land such as sailing, scuba diving, and castle building, wind surfing, boating, fishing etc.
_____	7.	Assist younger members in actually learning a specific topic in the project.
_____	8.	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.
_____	9.	Develop your own special project-related event. Create a plan, chart progress, analyze successes and/or problems and report results.
_____	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.
_____	12.	Compare and contrast the life cycles of salmon and steelhead.

Member Name: _____ Date: _____

Project Leader's Signature: _____ Date: _____

MARINE BIOLOGY AND OCEANOGRAPHY
Level V - Researcher

Date Completed

_____ 1. Report on the results of a demonstration comparing measurable differences in some aspect of your project. (experiment)

_____ 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 effect of temperature and light on marine organisms
- Ocean currents
- Marine mammals
- Aquaculture
- History of the whaling industry
- Local marine land pollution
- Wetland species
- Other

_____ 3. Identify eels and describe their life cycle.

_____ 4. Describe how a sea anemone gets its food. Identify 2 common sea creatures.

_____ 5. Describe 3 methods organisms can use to protect themselves.

Member Name: _____ Date: _____

Project Leader's Signature: _____ Date: _____

Certificate of Achievement

This certifies that

_____

has completed the Marine Biology and Oceanography Proficiency

in Tehama County.

Explorer	*Producer*	*Consumer*	*Leader*	*Researcher*
_____ *Date*	_____ *Date*	_____ *Date*	_____ *Date*	_____ *Date*
_____ *Initials*	_____ *Initials*	_____ *Initials*	_____ *Initials*	_____ *Initials*

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