



The *Bonhomme Richard* Series
Lesson 3
Working the Oceans: Careers in Marine Technology



LESSON OBJECTIVES

- Explore various careers related to marine technology
- Compare and contrast job duties, educational requirements, and salaries for careers in marine technology

NATIONAL SCIENCE EDUCATION STANDARDS

Content Standard E: Science and Technology

Abilities of technological design
Understandings about science and technology

Content Standard G: History of Nature of Science

Science as a human endeavor
Nature of science
History of science

OCEAN LITERACY PRINCIPLES

Principle #6: The ocean and humans are inextricably connected.

Principle #7: The ocean is largely unexplored.

To view the Ocean Literacy Principles, visit:

http://www.ngsednet.org/community/resource_uploads/OceanLitChart.pdf

INTRODUCTION

On September 23, 1779 one of the most fierce and famous battles of the Revolutionary War took place off the coast of Flamborough Head, England between the sailing ships *Bonhomme Richard* and H.M.S. *Serapis*. The *Bonhomme Richard* was captained by John Paul Jones, who is considered by some people to be the father of the United States Navy. The battle between the two ships took place at point-blank range and lasted almost three and a half hours. John Paul Jones was victorious and captured *Serapis* as his prize. Thirty-six hours after taking command of *Serapis*, he watched his beloved *Bonhomme Richard* sink into the North Sea. It was during this battle that Jones' legendary words, "I have not yet begun to fight!" were recorded in American history. The Ocean Technology Foundation (www.bonhomme-richard.org) and its team of partners, which includes archeologists, historians, technicians, and educators, are searching for the remains of the *Bonhomme Richard*. Marine technologies, such as sonar, research vessels, and computer models are critical in the search. (See Lesson 1 of this series.)

WARM-UP

Ask students to brainstorm different types of marine technologies (submersibles, sonar, water sampling tools, sediment sampling devices, thermometers, etc.) and the types of careers that would deal with marine technologies. List answers on the board. Answers may include marine archeologists, biologists, geologists, submarine pilots, ocean engineers, naval architects, shipbuilders, research vessel crew members, and others.

Marine Technology as a Career

Marine technology is the application of science and engineering knowledge, tools, and techniques to the understanding and use of the marine environment. Its scope is much wider than just the marine environment, however, because the ocean's impacts extend throughout the global environment.

The field of Marine technology deals with the marine environment, but has global implications as well. For example, over 95% of the world's goods arrive at their destination by ship. Marine technology is a broad field with many branches, and it intersects directly with environmental and resource management, transportation, construction, communication, and recreation. Some examples of career fields in marine technology are:

Ocean Resource Activities: fishing, mineral extraction, aquarium technology, aquaculture

Transportation Activities: ship design, construction and maintenance, harbor and port operations, salvage operations

Military Activities: monitoring and predicting the ocean environment, diving and salvage

Exploration and Research Activities: sea floor surveys, scientific and industrial experimentation, submarine vehicles

Human-Environment Interface Activities: coastal construction, environmental protection and forecasting, determining shipping routes, flood control

It has been estimated that there may be more than one million marine technicians employed nationwide. They work on board a ship at sea, on an oil drilling platform, under the ocean in a submarine, or in a shore-based laboratory. Employers of marine technicians are just as diverse: the government, public companies, and research institutes all require their services.

Skilled marine technicians are in demand by industry, government agencies, the research community, consulting firms, and many other employers. That need will continue to grow as ocean exploration, the nation's reliance on marine resources, and technological advances continue.

ACTIVITIES

1) Visit the NOAA Office of Ocean Exploration OceanAge Careers Website (<http://oceanexplorer.noaa.gov/edu/oceanage/welcome.html>) which contains video profiles of scientists describing their research and work; their education, salary, and hours; rewards of their chosen fields and words of advice. Choose two of the professions listed, and watch the video or read the transcript of that professional's interview. In one or two paragraphs, write a comparison of the two jobs you chose. Which aspects are similar? Which are different? What kind of education is needed? How much is the salary?

2) Visit the Ocean Careers website at www.oceancareers.com. Under the "Jobs and Internships" link, browse through the job listings and choose one job that you think you might like to do for a week. Write a paragraph about those aspects of the job that appeal to you, and those that you do not find appealing.

3) According to recent occupational employment statistics from the U. S. Bureau of Labor, a Marine Technician might make an entry level salary of \$29,730 per year. An experienced technician might make \$53,650 per year. Determine the hourly rates for each, based on a 40-hour work week.

A Marine Biologist might earn an entry level salary of \$39,570 per year. With experience, that salary may increase to \$64,930 per year. Determine the hourly rates for each level, based on a 40-hour work week.

Create a single bar graph which compares the two different careers' hourly rates for an entry level position, and for an experienced worker.

ADDITIONAL RESOURCES

Ocean Technology Foundation's Search for the *Bonhomme Richard*
<http://www.bonhommerichard.org>

Sea Grant Marine Careers
<http://www.marinecareers.net/>

Sea Grant Ocean Sciences Education Center
<http://www.marine-ed.org/bridge/>
(Click on "Guiding Students," then "Careers")

Marine Advanced Technology Education Center
<http://www.marinetech.org/careers/index.php>

Ocean science-related programs for high school students
http://www.onr.navy.mil/careers/ocean_marine/education_key.asp

Links to other marine careers resources
<http://hopkins.stanford.edu/careers.htm>

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