



OCEANOGRAPHY

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

Oceanography is a laboratory-oriented course in which students are involved in an in-depth study of the physical, chemical, geological, and biological aspects of the oceans. Field studies and investigations of local, regional, and national issues and concerns are required components of the course. Students also explore the relationships of oceanography to their interests, to career opportunities, and to the historical contributions of science. Topics include oceanographic instruments; the chemistry of sea water; ocean sediments; weather and climate; waves, tides, and currents; life in the oceans; habitats; maritime heritage; and current issues created by the interaction of science and technology.

COURSE GOALS

- Develop an understanding of the marine environment
- Develop the major physical, chemical, geological, and biological concepts of the seas and coastal world through classroom activities, laboratory investigations, and field studies
- Strengthen problem-solving and decision-making skills through science activities and issue investigations
- Develop an understanding of the economic importance of the seas and how to manage and conserve marine resources

PREREQUISITE

Earth Science

OPTIONS FOR NEXT COURSE

Chemistry (Algebra II prerequisite or co-requisite)

Physics (Algebra II prerequisite or co-requisite)

Advanced Placement Environmental Science (Biology and Chemistry prerequisite)

Advanced Placement Biology (Chemistry and Biology prerequisite)

Advanced Placement Chemistry (Chemistry prerequisite)

Advanced Placement Physics (Algebra II/Trigonometry prerequisite)

Biology

Astronomy (Earth Science prerequisite)

REQUIRED STUDENT TEXTBOOK

Oceanography, Trujillo, Thurman (Prentice Hall, 2008)

MINIMUM REQUIREMENTS

- Demonstrate knowledge and understanding of all core objectives through laboratory investigations, issue investigations, projects, oral and/or written tests, quizzes, and reports
- Participate in the core laboratory experiences and adhere to all safety procedures
- Prepare written reports for core laboratory activities
- Investigate and report on an issue of local, regional, national, or global concern; suggest possible solutions; design a plan of action for solving the problem
- Design and conduct at least one experiment; interpret and report the results
- Investigate and report on career opportunities and areas of interest in oceanography
- Set up and maintain a saltwater aquarium
- Select, read, and critique a marine science trade book
- Read and share current literature on relevant topics

The Knowledge, Skills, and Attitudes That Comprise the Oceanography Course are Summarized as Follows From the Prescribed Curriculum:

- Investigate the historical contributions of individuals towards the discipline of oceanography
- Set up and maintain a saltwater aquarium
- Demonstrate safe practices in the classroom, laboratory, and field
- Explain the importance of an estuary system with emphasis on the Chesapeake Bay
- Explain the theory of plate tectonics and relate it to crustal movements and geologic features of the Earth
- Describe features of the ocean floor to include continental margins and the ocean basin
- Relate satellite imagery to the topography of the ocean floor
- Differentiate between various marine sediments based on size, shape, and origin
- Explore the hydrothermal vent system
- Describe the factors that affect the physical and chemical properties of water
- Interpret the relationship between depth and pressure and the effect on marine organisms
- Analyze sea water to determine its chemical composition
- Describe global and local wind patterns to include sea breezes, monsoons, hurricanes, and tornadoes
- Discuss the Earth's atmosphere and problems associated with man's influence
- Identify and describe ocean currents and the reasons they exist
- Classify waves and compare different types of waves
- Identify the forces that create tides and describe tide patterns
- Describe and compare coasts and beaches based on their shoreline features
- Describe shoreline effects to include longshore currents, rip currents, and man-made features
- Examine the barrier islands and their importance
- Identify the factors that control primary production of the oceans and analyze the energy flow
- Classify marine organisms according to physical similarities
- Classify oceanic zones and describe the organisms of each
- Investigate representative groups of organisms from ocean and beach environments
- Examine coastal habitats for their physical characteristics, plant and animal populations, and man's effect on the habitats
- Classify various types of boats and ships
- Evaluate the importance of coastal planning near wetlands or estuary systems
- Integrate lighthouse history with folklore and daymark with locations
- Investigate global environmental issues as they relate to the marine environment

Core Areas For Laboratory Experiences

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| • Safety | • Measurement skills | • Identification and classification of organisms |
| • Data collection | • Chemical composition of sea water | • Food webs |
| • Charts/graphs/tables interpretation | • Physical factors of sea water | • Adaptations of marine organisms |
| • Field study | • Atmospheric circulation | • Fish populations |
| • Aquarium set-up | • Ocean currents | • Land use simulations |
| • Coastal habitats | • Tides and waves | |
| • Plate tectonics | | |
| • Coastline changes | | |



VIRGINIA BEACH CITY PUBLIC SCHOOLS

A H E A D O F T H E C U R V E

MISSION STATEMENT

The Virginia Beach City Public Schools, in partnership with the entire community, will empower every student to become a life-long learner who is a responsible, productive and engaged citizen within the global community.

DEPARTMENT OF CURRICULUM AND INSTRUCTION

2512 George Mason Drive P.O. Box 6038

Virginia Beach, VA 23456-0038

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Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write The Department of Curriculum and Instruction, Director of Secondary Instructional Services, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038, Telephone (757) 263-1070 or (757) 263-1429, fax (757) 263-1412.