



## BIOLOGY

*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**

Biology is the study of life – the basic characteristics and functions of living organisms and their place in our environment. Laboratory and field investigations are the primary means for developing problem-solving skills and for developing knowledge and understanding of biological concepts. Topics include the history of biology; the cell and cell processes; genetics and heredity; cycles in nature; photosynthesis and respiration; ecology; plants, animals, and microorganisms; continuity of life; and the interaction of science, technology, and society. Students will take the Standards of Learning test for Biology or a substitute test approved by the State Board of Education. Specific dates for the spring SOL test (April/May) or the summer SOL Test will be announced by the school system.

### **COURSE GOALS**

- Develop a foundation of interrelated biological concepts for understanding the characteristics and functions of living things
- Develop investigative skills in order to solve real problems
- Apply the processes of rational thought to make responsible decisions about issues relating from the interactions of science, technology, and society
- Explore the application of biological principles in modern life, in careers, and in other areas of interest

### **PREREQUISITE**

None

### **OPTIONS FOR NEXT COURSE**

Chemistry (Algebra II prerequisite or co-requisite)

Earth Science

Oceanography (Earth Science prerequisite)

Astronomy (Earth Science prerequisite)

Physics (Algebra II prerequisite or co-requisite)

### **REQUIRED STUDENT TEXTBOOK**

*Biology*, Biggs, Hogins, Holliday (Glencoe, 2009)

### **MINIMUM REQUIREMENTS**

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

**THE INSTRUCTIONAL OBJECTIVES THAT COMPRISE THE BIOLOGY COURSE ARE LISTED AS FOLLOWS FROM THE PRESCRIBED CURRICULUM:**

- Demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations
- Investigate and understand the chemical and biochemical principles essential for life.
- Investigate and understand relationships between cell structure and function.
- Investigate and understand life functions of Archaea, Bacteria and Eukarya.
- Investigate and understand common mechanisms of inheritance and protein synthesis.
- Investigate and understand bases for modern classification systems.
- Investigate and understand how populations change through time.
- Investigate and understand dynamic equilibria within populations, communities, and ecosystems.

**Core Areas For Laboratory Experience**

- Safety
- Presence of organic molecules
- Use of the microscope
- Structure of plant and animal cells
- Homeostasis
- Photosynthesis and respiration
- Structure of DNA
- Mitosis and meiosis
- Basic principles of heredity
- Human genetic traits
- Organic variation and adaptation
- Classification
- Characteristics of bacteria
- Types and structure of algae
- Structure and characteristics of protozoans
- Structure and characteristics of fungi
- Structure of monocot and dicot seeds
- Structure of roots, stems, and leaves
- Relationship of structure to function in flowers
- Investigations to illustrate increasing complexity and development of life (three labs)
- Relationships among the biotic and physical components of an ecosystem
- Energy transfer in trophic levels
- Changes in population density



**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**

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**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.