



## 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.*

Dr. James G. Merrill, Superintendent

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CIE-0005 (Revised 8/12)