

## **Earth Science - Grade: 9**

Prerequisite: None. Major emphasis and laboratory work are in the areas of geology, astronomy, meteorology, oceanography and physical geography.

## **Earth Science Honors - Grade: 9**

Prerequisite: Recommendation from eighth grade science teacher and Algebra I. This course involves the study of the earth and its place in space. It encompasses the areas of astronomy, geology, meteorology, oceanography, and physical geography.

## **Earth Science II: Advanced Topics (Oceanography) - Grade: 9-12**

Advanced Topics will be taught as an environmental geology course. This class will teach and use the process of science to study the Earth's composition, structure, processes; its atmosphere, freshwater, and oceans; as well as its local and global environment. Major topics of study include mineral and energy resources, anthropogenic effects on global systems- overpopulation, natural disasters, global warming, freshwater depletion, pollution, and sustainability.

## **Environmental Science – Grade: 9-12**

The goal of this course is to provide the students with the skills and content necessary for them to analyze current and future environmental issues, both natural and man-made, through a critical lens and to provide a platform to make informed decisions.

## **Biology - Grade: 10**

Prerequisite: Completion of Earth Science or Earth Science CH. The main objectives are to have the student plan and conduct investigations. The students will investigate the history of biological concepts, the biochemical principles essential for life, the relationship between cell structure and function, the basis of classification systems, and the common mechanism of inheritance.

## **Biology Honors - Grade: 10**

Prerequisite: Recommendation from 9th grade science teacher and successful completion of Earth Science or Earth Science Honors with an A or B. This course is designed for college-bound students and provides the students with a detailed understanding of living systems, classification of organisms, biochemical life processes, cellular organization, and mechanisms of inheritance. Also included are population studies, interactions and relationships among organisms, populations, communities, ecosystems and their environments, as well as changes in organisms through time.

## **Biology II/ Ecology - Grade: 10-12**

Involves hands-on laboratory activities - learning about issues and interactions between man and his environment.

## **Chemistry - Grade: 11 – 12**

First year chemistry prerequisite: successful completion of or concurrent enrollment with Algebra II.

## **Anatomy and Physiology - Grade: 11–12**

Students will develop an understanding of the anatomical and chemical makeup of cells, tissues, organs and organ systems as they relate to the whole organism. The students will learn the location and function of the various parts of the skeletal system.

## **AP Environmental Science - Grade: 11-12**

Environmental Science course is designed to be the equivalent of a one semester, introductory college course in environmental science. The goal of the A.P. Environmental Science is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural

and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Course Requirements: Must have taken and passed with a C or better: Algebra 2 and Chemistry (the Instructor has ability override) A daily commitment to read and good attendance.

### **AP Chemistry - Grade: 12**

Prerequisite: A or B in Chemistry.

### **Physics/AP Physics - Grade: 12**

Prerequisite: Recommendation from previous science teacher; completion of chemistry and trigonometry/ analysis, or concurrent enrollment.

Physics I at Patrick Henry High School is taught concurrently with the Advanced Placement Physics Class. The Physics I class syllabus is outlined in the Virginia Department of Education SOLS for Physics. The general content of the Physics I class and the A.P Physics class are parallel. Lectures and Labs will be conducted with both classes. However, the Physics I class follows more of a conceptual model whereas the A.P. Physics class is much more analytical and critical in nature. The Physics I class will use the approved high school text: *Physics by Serway and Vaughn, 2012, Holt McDougal*

The Physics standards emphasize a more complex understanding of experimentation, the analysis of data, and the use of reasoning and logic to evaluate evidence. The use of mathematics, including algebra and trigonometry, is important, but conceptual understanding of physical systems remains a primary concern. Students build on basic physical science principles by exploring in-depth the nature and characteristics of energy and its dynamic interaction with matter. Key areas covered by the standards include force and motion, energy transformations, wave phenomena and the electromagnetic spectrum, electricity, fields, and non-Newtonian physics. The standards stress the practical application of physics in other areas of science, technology, engineering, and mathematics. The effects of physics on our world are investigated through the study of critical, contemporary global topics.