

HONORS BIOLOGY

Code: S461 Full Year (9-12) (1 credit)

(rank weight 1.04)

Recommendation: Participation in the eighth grade Earth Science program with a minimum final average of 85%, or 90% average in ninth grade Earth Science.

Areas of Study Include:

- **Biology as a Science**
 - Scientific Method
 - Tools of Science
 - Microscope
 - Bioethics
 - Safety

- **Unity and Diversity Among Living Things**
 - Concept of Life
 - Historical perspective
 - Cytology
 - Taxonomy
 - Chemistry of Living Things: Organic & Inorganic
 - Enzymes

- **Maintenance in Living Things**
 - Adaptations for Maintenance in Representative Organisms
 - Nutrition
 - Chemistry of Photosynthesis
 - Transport
 - Respiration
 - Chemistry of Cellular Respiration
 - Excretion
 - Chemical and Nervous Regulation
 - Locomotion

- **Human Physiology**
 - Human Body Systems
 - Adaptations for Maintenance
 - Human Disease

- **Reproduction and Development**
 - Asexual Reproduction in Organisms
 - Mitosis and Cytokinesis: Cellular Reproduction
 - Vegetative Propagation
 - Sexual Reproduction in Humans, Animals, and Plants
 - Gametogenesis and Meiosis
 - Fertilization, Early Development, Embryo Development, Birth
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- Transmission of Traits through Generations
 - Historical Perspective
 - Classical Mendelian Genetics
 - Incomplete Dominance, Codominance, Multiple Alleles
 - Gene Linkage, Sex Linkage, Pedigrees
 - Genetic Disorders
 - Mutations
 - Modern Genetics
 - Watson, Crick, and Franklin
 - DNA; Nucleotides, Transcription, and Replication
 - DNA Fingerprinting, Electrophoresis
 - Genetic Engineering
 - Protein Synthesis
 - Population Genetics

- Evolution
 - Organic Evolution
 - The Heterotroph Hypothesis
 - Supporting Evidence for Evolution
 - Lamarck, Darwin, Oparin, Stanley, Hardy-Weinberg
 - Sources of Variation
 - Adaptation and Natural Selection
 - Gradualism and Punctuated Equilibrium
 - Speciation
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- Ecology
 - Populations, Communities, Ecosystems, Biosphere
 - Abiotic and Biotic Factors
 - Nutritional Relationships: Autotroph, Heterotroph
 - Symbiotic Relationships; Mutualism, Commensalism, Parasitism
 - Energy Flow in an Ecosystem
 - Food Webs, Food Chains
 - Nitrogen Cycle, Carbon Cycle, Water Cycle
 - Ecological Succession
 - Biomes
 - Human Impact on the Environment
 - Endangered Species
 - Pollution

Assessment: The final examination is the NY State prepared Living Environment Biology Regents. Students are also encouraged to take the SAT II exam in Biology.

Note: Students should have an above average reading grade level. Stress is placed on individual achievement.