



**Dover Area School District Curriculum K-U-D
High School Environmental Biology**

	Know	Understand	Do
BIO.A.1.1 Explain the characteristics common to all organisms.	<ul style="list-style-type: none"> - Abiotic and biotic factors - Classification of organisms - Characteristics of life 	Students will understand the unity and diversity of life.	Describe and identify the characteristics of life shared by all prokaryotic and eukaryotic organisms.
BIO.A.1.2 Describe relationships between structure and function at biological levels of organization.	<ul style="list-style-type: none"> -Chemical levels of organization: proton, neutron, electron, molecule, macromolecule -Biological levels of multicellular organization: organelles, cells, tissues, organs, organ systems, and multicellular organisms 	Students will demonstrate understanding that structure determines function at all levels.	Describe and interpret relationships between structure and function at various levels of biological organization .
BIO.A.2.1 Describe how the unique properties of water support life on Earth.	Structure and classification of matter, basic chemical bonding, polarity	Students will demonstrate understanding that structure determines function at the chemical level. Students will understand the chemical basis of life.	Describe the unique properties of water and how these properties support life on Earth (e.g., freezing point, high specific heat, cohesion).
BIO.B.3.1 Explain the mechanisms of evolution.	<ul style="list-style-type: none"> - Structure of DNA - Mutations - Migration - Genetic Drift - Gene Flow - Natural Selection - Fitness - Adaptations 	Students will understand that evolution explains the unity, continuity, and diversity of life.	<p>Explain how natural selection can impact allele frequencies of a population.</p> <p>Describe the factors that can contribute to the development of new species (e.g., isolating mechanisms, genetic drift, founder effect, migration).</p> <p>Explain how genetic mutations may result in genotypic and phenotypic variations within a population.</p>
BIO.B.3.3 Apply scientific thinking, processes, tools, and technologies in the study of the theory of evolution.	<ul style="list-style-type: none"> -Laboratory safety rules/skills -Laboratory equipment uses -Inquiry skills: observation, inference, prediction, analysis, conclusion 	Students will understand that evolution explains the unity, continuity, and diversity of life.	Distinguish between the scientific terms: hypothesis, inference, law, theory, principle, fact, and observation. Write hypotheses and conclusions. Design experiments and collect data.
BIO.B.4.1 Describe ecological levels of organization in the biosphere.	-Ecological levels of organization: individual, population, community, ecosystem, biome, biosphere	Students will demonstrate understanding that structure determines function at all levels.	<p>Describe the levels of ecological organization (i.e., organism, population, community, ecosystem, biome, and biosphere).</p> <p>Describe characteristic biotic and abiotic components of aquatic and terrestrial ecosystems.</p>
BIO.B.4.2 Describe interactions and relationships in an ecosystem.	<ul style="list-style-type: none"> - competition, predation, symbiosis - food chains, food webs, energy pyramids - water cycle, carbon cycle, oxygen cycle, and nitrogen cycle - climate changes, introduction of nonnative species, invasive species, pollution, fires 	<p>Students will demonstrate an understanding of interdependence in nature.</p> <p>Students will understand that organisms use materials and energy.</p>	<p>Describe how energy flows through an ecosystem</p> <p>Describe biotic interactions in an ecosystem</p> <p>Describe how matter recycles through an ecosystem</p> <p>Describe how ecosystems change in response to natural and human disturbances</p>
4.1.10.A. Explain the concept of carrying capacity in an ecosystem.	<ul style="list-style-type: none"> - limiting factors - carrying capacity 	Students will demonstrate an understanding of interdependence in nature.	<p>Describe factors that affect the growth of populations.</p> <p>Describe the effects of limiting factors on population dynamics and potential species extinction.</p>



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4.1.10.A Explain the concept of endangered species.	<ul style="list-style-type: none"> - vulnerable species - threatened species - endangered species 	Students will demonstrate an understanding of how humans affect the balance of an ecosystem.	Describe how organisms become classified as threatened or endangered.
4.2.10.C. Explain the relationship between water quality and the diversity of life in a freshwater ecosystem.	<ul style="list-style-type: none"> - types of pollution 	Students will demonstrate an understanding of interdependence in nature.	Assess the health of an aquatic ecosystem using chemical and biological tests.
4.3.10.A. Evaluate factors affecting the use of natural resources.	<ul style="list-style-type: none"> -Renewability continuum -Sustainability -Ecological footprints 	Students will explain how humans use and affect natural resources	Differentiate between renewable and non-renewable resources and factors that affect these resources.
4.5.10.C. Analyze real-world data and explain how point and nonpoint source pollution can be detected and eliminated.	<ul style="list-style-type: none"> -Types of pollution -Watershed structure 	Students will explain and interpret data linked to human effects on the environment.	Differentiate between point and nonpoint sources of pollution and factors that cause them.