

Ridgefield Public Schools

Biology Curriculum at a Glance

Overview

This year-long 9th grade high school course involves a teacher guided process of engaging students in the study of life and living organisms, and examines biology and biochemistry in the real world. Through scaffolding, the course covers traditional concepts in biology and encourages exploration of science-based phenomena and real-world applications. The components include Matter and Energy in Living Systems, System Dynamics and Homeostasis, Inheritance and Variation, Natural Selection, and Sustainability.

Biology is a year-long 9th grade course aligned to the Performance Expectations of the Next Generation Science Standards (NGSS). The course focuses on the Life Science concepts of organism structure & function, inheritance & variation of traits, matter & energy in organisms & ecosystems, interdependent relationships in ecosystems, natural selection & evolution, and human impacts on Earth systems. Biology engages students in the study of life through three dimensional learning focusing on Biologic Core Ideas, developing scientific skills (Practices), while learning conceptual connections through crosscutting concepts.

Units of Study	
Unit 1	Life Needs Stability • Characteristics of Life • Hierarchy of Life • Review of Cells • Introduction to Chemistry • Introduction to Macromolecules • Homeostasis and Feedback Loops • Cellular Respiration • Cycle of Matter and Energy in Aerobic and Anaerobic Conditions

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Unit 2	All Life is Connected • Biodiversity • Population Dynamics • Carrying Capacity • Density Dependent and Independent Factors • Ecosystem Interactions • Transfer of Energy in Ecosystem • Succession
Unit 3	Human Actions Have Consequences • Climate Change • How the Ocean, Atmosphere, and Biosphere Interact and are Modified in Response to Human Activities • Sustainability of Human Society and Biodiversity • Natural Hazards • Speciation and Extinction • Photosynthesis • Cycling of Carbon
Unit 5	Life Needs Instructions • Cell Cycle • DNA and Replication • Protein Synthesis
Unit 6	Life's Instructions Change • Meiosis • Genetics and Punnett Squares • Epigenetics • Pedigrees
Unit 7	The Better Instructions Persist • Origin of Species • Phylogenetic Trees and Speciation • Evidence of Evolution • Natural Selection Leading to Evolution • Alleles and Advantageous Traits • Natural Selection Leading to Adaptation of Populations • Environmental Selection

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