Biology

UC/CSU "d" approved/NCAA approved
Grade Level: 9
Estimated Work Outside of Class: 2.5 hrs per week

Course Description:
In this required, college-prep laboratory science course, students explore the fundamental properties of life. Topics of study include the fundamentals of ecology and nutrient cycles; macromolecules, which make up living things; cell structure and function; cellular energy; introduction to genetics; and evolution. Students engage in class discussions, laboratory investigations, research, and the construction of models.

Prerequisite:
Placement in this course is based on a student's score in reading comprehension on the CCHS placement exam, 8th grade course and grade reported on the student's transcript, and 8th grade teacher recommendations.

Recommended Prerequisite Skills:
None

Course Grade Categories:
- Independent Practice: 20%
- Labs/Projects: 35%
- Assessments: 45%

Major Assessments/Units/Topics:
Assessments per unit: Quiz, Unit Test, Formal Lab Write Up, Activity.

Unit 1 Introduction to Biology
- Scientific Method (variables, conducting an experiment, observations)
- Lab Basics (equipment, measurements and safety)
- Characteristics of living things

Unit 2 Chemistry of Life
- What is matter
- Elements, compounds, mixtures
- Chemical Bonding
- Polarity
- Properties of Water
- Nutrient Cycles (carbon cycle, nitrogen cycle, and hydrologic cycle)

Unit 3 Ecology
- Levels of organization
- Biomes
- Energy Transfer (trophic levels)
- Basics of Photosynthesis and cellular respiration
- Food Webs

- Biodiversity
- Human Impact on Biodiversity
- Climate Change

Unit 4 Macromolecules

- Carbohydrates, lipids, proteins, & nucleic acids
- Monomers and polymers
- Dehydration Synthesis and Hydrolysis reactions
- Function of Enzymes

Unit 5 Cell Structure and Function

- Cell Theory
- Cell Organelles
- Photosynthesis deeper
- Cellular Respiration deeper
- Cell Membrane (fluid mosaic model/phospholipid bilayer)
- Cell Transport (active vs passive transport / osmosis and diffusion)

Unit 6 DNA and Protein Synthesis

- Structure of DNA and RNA
- Protein Synthesis
- DNA Replication
- Cell Cycle
- Mitosis
- Mutations

Unit 7 Genetics and Heredity, Meiosis

- Meiosis
- Mendelian Genetics
- Punnett Squares
- Non-mendelian Patterns of Inheritance
- Chromosomes & Karyotypes
- Human Genetic Disorders

Unit 8 Evolution

- Evidence of Evolution
- Darwinian Principles
- Adaptations
- Natural Selection
- Populations