

Pequannock Township School District

Curriculum Syllabus

Course Name and level / Grade level and Subject:
Honors Biology / Grade 9

Course Description:

This lab-based, inquiry-instructed course is aligned to the Next Generation Science Standards and the Common Core State Standards. This course deals with major concepts and theories of biology. Students develop an understanding of matter in terms of composition and changes in composition, and become able to solve scientific problems logically, use and write chemical formulae, as well as, write and balance chemical equations. This course will cover topics such as: Chemistry of living things, cell structure and function, energy and life, genetics and DNA, Evolution, Diversity of life, and Ecology

Course Standards:

The following is a list of NJSLS that describe what students are expected to know and be able to do as a result of successfully completing this course. The following NJSLS are the basis of the assessment of student achievement. The learner will demonstrate mastery of:

Units of Study	NGSS
Unit Plan 1: The Chemistry of Living Things	LS1-6 LS1-7
Unit Plan 2: Cell Structure & Function	LS1-1 LS1-2, LS1-3 LS1-4
Unit Plan 3: Energy & Life	LS1-5 LS1-7

<p>Unit Plan 4: Genetics & DNA</p>	<p>LS1-1 LS3-1, LS3-2, LS3-2 LS 4-1</p>
<p>Unit Plan 5: Evolution</p>	<p>LS4-2 LS4-3, LS4-4 LS4-5, LS4-6</p>
<p>Unit Plan 6: Diversity of Life</p>	<p>LS4-1 LS4-2</p>
<p>Unit Plan 7: Ecology</p>	<p>LS2-1, LS2-2 LS3-3, LS4-5 LS4-6</p>

Scope and Sequence

<p>Unit Plan 1: (15 days)</p> <p>The Chemistry of Living Things</p> <p>Biology and chemistry are two subjects that are tied closely together. A student cannot fully grasp all of the processes in an organism without a basic understanding of how reactions work and the structure of the atom. This unit serves to solidify students' foundation understanding of chemistry.</p>
<p>Unit Plan 2: (27 days)</p> <p>Cell Structure & Function</p> <p>Cell theory, along with evolution and genetics, form the foundation of modern biology. At the center of this, of course, is the cell. Without knowing each part of the cell and its role, students will not be able to link cells to functions of tissues and organs. Also, recognizing the importance of water balance is an underlying issue for later chapters, including ecology and body systems.</p>
<p>Unit Plan 3: (21 days)</p>

Energy & Life

Understanding both photosynthesis and respiration is the foundation for understanding of all of the processes that cells perform. This understanding is key for students to begin to see the interconnectedness of all living things.

Unit Plan 4: (31 days)

Genetics & DNA

Many of the questions that students ask relate to their appearance and how it relates to the appearance of their family. Having a solid genetic understanding allows students to see the traits that are carried down and lost and perform basic predictions. Modern development of DNA and genetics are the basis for emerging technologies and treatments. Understanding gene therapy, genetically modified foods, mutations, and DNA technology is key to existing as an informed citizen.

Unit Plan 5: (23 days)

Evolution

Evolution forms the foundation of modern biology. After the study of mutations creating different traits, the natural progression is to see the effect of differences. Evolution acts on these differences and creates the diversity that students see around them. The ideas in this unit underpin the understanding of units to come, especially the animal and plant units.

Unit Plan 6: (25 days)

Diversity of Life

From food to death, bacteria serve numerous roles in the modern world. Students consistently encounter new cases of bacterial disease or infestation in the news. Understanding of these “organisms” could help students avoid disease. The role of plants in the world cannot be understated. Seeing how plants reproduce is key for understanding how they live. Humans are not the only animals on Earth. Students often forget that the majority of the world population is invertebrate. This unit will show students the incredible adaptations that invertebrates have as well as the role that they play in the ecological world. While invertebrates dominate in numbers, vertebrates dominate in complexity. Vertebrates are the most familiar living things to students, and are the organisms that they have asked questions about their whole lives.

Unit Plan 7: (15 days)

Ecology

The highest level of biological organization is ecology. Understanding this topic means that students have a solid understanding of all topics previous. Also, news in recent years has involved more ecological trends and ideas. Events like the Gulf Oil Spill, Global Warming, and recent flooding in the Northeast show the human impact on the environment. Students need to be able to discuss ecological topics to be part of modern society.

Assessments

Evaluation of student achievement in this course will be based on the following:

- a. *Tests*
- b. *Quizzes*
- c. *Concept Checks*
- d. *Modelling activities*
- e. *Lab experiments*
- f. *Lab reports/questions*

Curriculum Resources

Anchor Programs/Teacher Materials

Prentice Hall Biology

Home and School Connection

The following are suggestions and/or resources that will help parents support their children:

- <http://www.bozemanscience.com/chemistry>
- <https://www.khanacademy.org/science/biology>
- <https://www.youtube.com/user/AmoebaSisters>