

Pequannock Township School District Curriculum Syllabus

Genetics / Grade 10

Course Description:

This course is designed to go into depth within the field of genetics. Genetics is the study of genes at various levels, from molecular to population, and at different life stages. In this course, students will gain knowledge from many of the different subfields of genetics while being able to connect each field to develop a larger picture. The students will be able to obtain skills necessary to work in this field by using various tools, technology, laboratory investigations, and case studies.

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:

NJSLS	New Jersey Student Learning Standards
SL.9-10.4.	Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.
RI.9-10.2.	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
SL.9-10.1.	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, teacher led) with peers on grades 9-10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively

W.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence
W.9-10.2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content
SL.9-10.5	Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance findings, reasoning, and evidence and to add interest.

Scope and Sequence

Unit 1: Marking Period 1

In this unit, the concepts that will be studied include mitosis, meiosis, Mendelian genetics, non-mendelian genetics, and chromosome mapping. This gives the students an introduction of how traits and genes are passed down to the following generations. Genetics is the study of heredity and therefore, the students will be able to understand the future units better with this inclusive background.

Unit 2: Marking Period 1-2

In this unit, the students will study the structure and function of DNA, replication, transcription, translation, and epigenetics. This unit will go into more detail of the molecular relationship of genetics and heredity. Specifically, the influence that DNA has on the makeup of organisms.

Unit 3: Marking Period 2-3

In this unit, the students will study mutations, pedigrees, genetics of cancer, and pharmacogenetics. The students will examine how genetics is connected to the health field through real life examples, research, case studies, and experimentation. Specifically, it prepares students to identify and research hereditary disorders, various types of cancers, and different types of drugs for treatment.

Unit 4: Marking Period 3-4

In this unit, the students will study genomics, genetic engineering, and biotechnology processes. The students will analyze the technology available in the genetics field by interpreting the advantages and disadvantages. They are prompted to research this technology and use engineering design practices to brainstorm novel genetic technology.

Assessments

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

- a. Projects
- b. Case Studies
- c. Quizzes
- d. Tests
- e. Laboratory Experiments
- f. Activities

Curriculum Resources

Anchor Programs/Teacher Materials:

- **Textbook:** Essentials of Genetics, 10e, By: William S. Klug, Michael R. Cummings, Charlotte A. Spencer, Michael A. Palladino, Darrell J. Killian.

Home and School Connection

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

- Khan Academy and Bozeman Science Videos
- <https://teach.genetics.utah.edu/>
- <http://genesinlife.org/teachingtools>