

06_Genetic Inheritance

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **3-4 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

Biology focuses on the diversity, complexity, and interdependence of life on Earth. Students will develop an understanding of how organisms evolve, reproduce, and adapt to their environments. This will include an exploration of how to relate the structure and function of molecules to their role in cell biology and metabolism. Further understanding of evolution and reproduction will be explored through the science of genetics. Knowledge of biodiversity and adaptation will be illustrated through the science of ecology.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

- In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited.
- Apply concepts of statistics and probability (including Punnett square)

CONTENT AREA STANDARDS

SCI.HS-LS3-1	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
SCI.HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

MA.K-12.4	Model with mathematics.
LA.RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.) and make relevant connections, to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
MA.F-BF.A.1	Write a function that describes a relationship between two quantities.
LA.W.9-10.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when

appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

TECH.9.4.12.CI.1

Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).

TECH.9.4.12.IML.3

Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8).

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- Genetic mutations produce genetic variations between cells or organisms.
- Genetic variations produced by mutation and meiosis can be inherited

Procedural Knowledge

Students will be able to:

- Students can identify and explain the idea that inheritable genetic variations may result from:
 - New genetic combinations through meiosis.
 - Viable errors occurring during replication.

EVIDENCE OF LEARNING

Formative Assessments

- Checks for understanding during lesson.
- Do Now activities.
- Student-centered questioning and discussion that is facilitated by instructor.
- Exit Tickets.

Summative Assessments

- Exams/Unit Exams.
- Quizzes.
- Laboratory Activities.

RESOURCES (Instructional, Supplemental, Intervention Materials)

[Miller & Levine Biology Textbook](#)

- Unit 4 - Genetics
 - Chapter 12 - Introduction to Genetics
 - Case Study: *Genetic Disorders: understanding the odds.*
 - Interactivity: *Segregation.*
 - Interactivity: *Punnett Squares.*
 - Analyzing Data: *Human Blood Types.*
 - Modeling Lab: *A Model of Meiosis.*

POGIL Biology

- Meiosi

[Brainpop](#)

[NSTA](#)

[Data Nuggets](#)

INTERDISCIPLINARY CONNECTIONS

ELA/Literacy

Mathematics

Technology

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.

