Unit 8: Genetic Engineering

Content Area: **Template**
Course(s):
Time Period:
Length:
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Unit 8: Genetic Engineering

Learning Objectives

- How do humans take advantage of naturally occurring variation among organisms?
- How do humans use genetic engineering?
- How do scientists study and work with specific genes?
- What are the ethical issues raised by genetic engineering?

Essential Skills

- Apply scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence
- Describe how a disease is the result of a malfunctioning system, organ, and cell, and relate this to possible treatment interventions
- Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences
- Explain the value and potential applications of genome projects
- Provide a scientific explanation for the history of life on Earth using scientific evidence
- Reflect on and revise observations as new evidence emerges
- Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams
- Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories
- Use data representations and new models to revise predictions and explanations

Standards

9-12.HS-LS1-1	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.
9-12.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
9-12.HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
9-12.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.
9-12.HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Instructional Tasks/Activities

- Chapter Test
- Create a transgenic organism: Students describe a hypothetical transgenic organism they would create by combining the genomes of 2 animals. Then explain how the process could occur using genetic engineering concepts.
- GM Research: Students research a type of GM food, animal, or plant, and describe the process in which it was created and the benefits and risks.
- Review game
- Rhino Investigation: Students use paper-based DNA fingerprinting simulation to determine which animal's tusks have been confiscated from poachers.
- Vocabulary Quizzes

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Foldables – organization of material (types of GE processes, uses of GE)
- GATTACA – students watch movie and answer questions to review genetic engineering concepts. Students describe misconceptions implied in the movie. Students express opinion of living in the scenario presented in movie.
- Group discussion
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review

- Performance
- PowerPoint presentation of material
- Problem Correction
- Project
- Quiz
- Rubric
- Selective Breeding Corn Activity – Students collect and interpret data from given samples of corn to determine prevalence of yellow and blue kernels. Then explain how a farmer could use selective breeding to create a crop of corn with mostly yellow kernels.
- Teacher Collected Data
- Test
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating

- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

N/A

Resources

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5