8 Science Unit 1: Cells & Genetics

Content Area: **Science**
Course(s):
Time Period: **Marking Period 1**
Length: **15 Weeks**
Status: **Published**

Unit Overview

Traits

The island of Madagascar has plants and animals that exist nowhere else on the planet. Plan an eco-tour, highlighting how the unique physical and behavioral traits of these organisms have helped them survive.

Bodies

Everyday, people all over the world get sick. Sometimes they recover; sometimes they don’t. Like a doctor, use evidence from medical charts, test results, and medical fact sheets to "diagnose" problems four patients are experiencing.

Cells

Some scientists believe they are on the verge of creating life itself. Work as a technician in a biology lab to create a model of a synthetic animal or plant cell. Then, devise a test to determine if synthetic organisms are really alive.

Genes

Coral reefs around the world are threatened by rising ocean temperatures. Working as an official at a National Park, you'll use your understanding of genes and inheritance to devise a management plan to save local coral reefs.

Changes in Genes

Organisms' traits can be altered when their genes are changed by mutations or genetic engineering. Critique articles about mutations and genetic engineering by assessing the reliability of each article's source.

Standards

Science and Engineering Practices

- Analyzing and Interpreting Data
- Asking Questions and Defining Problems
- Constructing Explanations and Designing Solutions
- Developing and Using Models
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information
- Planning and Carrying Out Investigations
- Using Mathematics and Computational Thinking

Crosscutting Concepts

- Cause and Effect
- Patterns
- Scale, Proportion, and Quantity
- Stability and Change
- Structure and Function
- Stems and System Models

MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
MS-LS1-3	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
MS-LS1-4	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
MS-LS3-1	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
MS-LS3-2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Materials

Core Materials:

- TCI Cells & Genetics Text and Online Resources
    - Traits
    - Bodies
    - Cells
    - Genes
    - Changes in Genes
- Teacher Created Labs

Supplemental Materials:

- Gizmos
- BrainPop resources
- GRC Lessons
- Nearpod Activities

Technology

8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Evidence of Learning/Assessment

Formative Assessment

- Teacher Observation
- Quizzes
- Exit Tickets
- Labs

Summative Assessment

- Unit Tests
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Follow IEP Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

504

Follow 504 Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe

At-risk of Failure

- Extra time during intervention
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe

Gifted & Talented

- Independent projects
- STEM Projects

Interdisciplinary Connections

Climate Change

- Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.
- Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.
- Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.

RI.CR.8.1	Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.
RI.CI.8.2	Determine a central idea of an informational text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
8.F.B	Use functions to model relationships between quantities
W.AW.8.1	Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
W.IW.8.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

8.SP.A	Investigate patterns of association in bivariate data

Career Readiness, Life Literacies, and Key Skills

9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
9.1.8.CR.3	Relate the importance of consumer, business, and government responsibility to the economy and personal finance.
9.1.8.CR.4	Examine the implications of legal and ethical behaviors when making financial decisions.
9.4.8.DC.1	Analyze the resource citations in online materials for proper use.
9.2.8.CAP.15	Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
9.4.8.IML.12	Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.
9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
9.4.8.TL.3	Select appropriate tools to organize and present information digitally.

Career Ready Practices

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP7. Employ valid and reliable research strategies.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.
- CRP12. Work productively in teams while using cultural global competence