7.5 Genetics

Content Area: **Science**
Course(s):
Time Period: **Marking Period 3**
Length: **7 weeks**
Status: **Published**

Course Pacing Guide

Unit	Marking Period	Length
Chemical Reactions and Matter Transformation	1	6 weeks
Cells and Systems (2019 only)	1	6 weeks
Metabolic Reactions	2	6 weeks
Genetics (2019 only)	2,3	4 weeks
Evolution (2019 only)	3	4 weeks
Photosynthesis and Matter Cycling	4	8 weeks
Ecosystems	4	6 weeks

Unit Overview

In this unit, students develop and use models to describe how gene mutations and sexual reproduction contribute to genetic variation. Students understand how genetic factors determine the growth of an individual organism. They also demonstrate understanding of the genetic implications of sexual and asexual reproduction. The crosscutting concepts of cause and effect and structure and function provide a framework for understanding how gene structure determines differences in the functioning of organisms. Students are expected to demonstrate proficiency in developing and using models. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

Enduring Understandings

* DNA is the molecule that determines an organism’s traits.

* Variation is DNA result in different phenotypes that can be predicted with simple probability problems.

Essential Questions

Why is the study of heredity important for understanding human health?

How can probability be used to predict genetic traits?

New Jersey Student Learning Standards (No CCS)

SCI.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.
SCI.MS-LS4-5	Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.
SCI.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.

Interdisciplinary Connections

LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
MA.6.SP.B.5	Summarize numerical data sets in relation to their context, such as by:

Technology Standards

TECH.8.1.8.A.2	Create a document (e.g., newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.
TECH.8.1.8.A.4	Graph and calculate data within a spreadsheet and present a summary of the results.

21st Century Themes/Careers

CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.

Instructional Strategies & Learning Activities

Differentiated Instruction

Examples may include:
Inquiry/Problem-Based Learning
Learning preferences integration (visual, auditory, kinesthetic)
Sentence & Discussion Stems
Tiered Learning Targets
Meaningful Student Voice & Choice
Relationship-Building & Team-Building
Self-Directed Learning
LMS use
Student Data Inventories
Mastery Learning (feedback toward goal)
Grouping
Rubrics
Jigsaws
Assessment Design & Backwards Planning
Student Interest & Inventory Data

Formative Assessments

Include, but are not limited to:

- Initial models
- Driving Question Board
- Notebook checks
- Progress Trackers
- Scientists Circle discussions
- Peer Feedback rubrics

Summative Assessment

Scientific Explanation (Midpoint assessment)

Transfer task (final unit assessment): Students will apply understanding of phenomenon to a related phenomenon (investigating other animals).

Benchmark Assessments

Fall/Winter LinkIt Assessments

Alternate Assessments

Modifications to assessments based on IEP/504; alternate assessments may include oral explanations, scaffolded templates, digital choice for final model representations

Resources & Technology

Internet Technology (visual aides, videos, interactive websites)

BOE Approved Texts

McGraw Hill Education: Life Science (iScience series)

Closure

Individual classes and lessons will end with a closure activity that reinforces what students figured out during class, and helps navigate toward next steps.

Closure activities may include:

- Scientists' Circle
- Post-it reflection
- Google form exit ticket
- Group performance reflection
- Science notebook jot

ELL

- Alternate Responses
- Extended Time
- Teacher Modeling
- Simplified Written and Verbal Instructions
- Frequent Breaks
- Google Translate

Special Education

Accommodations will be made in accordance with students' IEPs. The following list provides examples:

- Shorten assignments to focus on mastery of key concepts.
- Substitute alternatives for written assignments (clay models, posters, panoramas, collections, etc.)
- Keep workspaces clear of unrelated materials.
- Provide a computer for written work.
- Seat the student close to the teacher or a positive role model.
- Provide an unobstructed view of the chalkboard, teacher, movie screen, etc.
- Keep extra supplies of classroom materials (pencils, books) on hand.
- Maintain adequate space between desks.
- Give directions in small steps and in as few words as possible.
- Number and sequence the steps in a task.
- Have student repeat the directions for a task.
- Provide visual aids.
- Go over directions orally.
- Allow the student to complete an independent project as an alternative test.
- Show a model of the end product of directions (e.g., a completed math problem or finished quiz).
- Stand near the student when giving directions or presenting a lesson.
- Mark the correct answers rather than the incorrect ones.

- Use a pass-fail or an alternative grading system when the student is assessed on his or her own growth.

504

Examples of accommodations in 504 plans include but are not limited to:

- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- verbal, visual, or technology aids
- modified textbooks or audio-video materials
- behavior management support
- verbal testing
- excused lateness, absence, or missed classwork
- pre-approved nurse's office visits and accompaniment to visits

At Risk

Examples may include:

- Have student restate information
- Provision of notes or outlines
- Concrete examples
- Assistance in maintaining uncluttered space
- Weekly home-school communication tools (notebook, daily log, phone calls or email messages)
- Peer or scribe note-taking
- Use of manipulatives
- No penalty for spelling errors or sloppy handwriting
- Follow a routine/schedule

- Teach time management skills
- Verbal and visual cues regarding directions and staying on task
- Adjusted assignment timelines
- Visual daily schedule
- Immediate feedback
- Work-in-progress check
- Pace long-term projects
- Preview test procedures
- Film or video supplements in place of reading text
- Pass/no pass option
- Cue/model expected behavior
- Use de-escalation strategies
- Use peer supports and mentoring
- Have parent sign homework/behavior chart

Gifted and Talented

Examples may include:

- Offer choice
- Speak to Student Interests
- Allow G/T students to work together
- Tiered learning
- Focus on effort and practice
- Encourage risk taking