Biological Life Science

Content Area: **Science**
Course(s): **Biology**
Time Period:
Length: **School Year**
Status: **Not Published**

Course Overview: Objectives, Benchmarking, and Screening Plan

Statement of Purpose

The Biological Life Sciences course provides a comprehensive study of fundamental biological concepts, unifying principles, and the interrelationships that define life. Students will explore the diversity of living organisms and their interactions within ecosystems, emphasizing the connections between biology, the environment, and current global challenges. Biology is an all-encompassing term that includes Matter and Energy Transformations in Ecosystems, Interdependent Relationships, Human Activity and Biodiversity, Cells and Homeostasis, DNA and Inheritance, and Evolution. By engaging in inquiry-based learning, laboratory investigations, and real-world applications, students will develop critical thinking skills and a deeper understanding of the biological sciences. This course will prepare students for future scientific study and informed decision-making in an increasingly complex world.

Biology is the study of life, and this course guides students through key biological concepts, theories, and phenomena using an evolutionary approach within the cycle of life. Students will explore how Earth supports life, examine the essential components necessary for survival, and analyze how life changes over time through genetic variation and environmental influences.

Through inquiry-driven learning, students will:

- Evaluate what it means to be alive by identifying the characteristics of life and the role of abiotic factors in sustaining life.
- Investigate the physical and biological changes that organisms undergo and connect these changes to broader ecological and evolutionary patterns.
- Explain the mechanisms of heredity and explore how genetic variations drive natural and artificial selection, leading to evolutionary changes in populations.
- Develop critical thinking skills by conducting research, formulating claims, designing experiments, collecting and analyzing data, and drawing evidence-based conclusions.
- Apply biological concepts to real-world challenges, emphasizing the impact of human activity on ecosystems, biodiversity, and sustainability.

This course takes a student-centered approach, encouraging hands-on exploration and scientific reasoning to deepen understanding of the living world and its complex interconnections. There will be three benchmark assessments throughout the year.

Course Name, Length, Date of Revision and Curriculum Writer

Biological Life Science
5 Credits
Full Year
Written: April, 2025
Curriculum Writers: Meenu Kohli, Christina McCabe

Table of Contents

Unit 1: Macromolecules and Homeostasis

Content Area: **Science**
Course(s): **Biological Life Scienc**
Time Period: **1st Marking Period**
Length: **3 weeks**
Status: **Awaiting Review**

Summary of the Unit

In this unit, students will formulate an answer to the question "How do the structures of organisms enable life's functions?" Students investigate explanations for the structure and functions of macromolecules, of hierarchical organization of interacting organ systems, and of the role of homeostasis.

Enduring Understandings

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
- Feedback mechanisms maintain a living system's internal conditions within certain limits, and they mediate behaviors, allowing the system to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
- Feedback (negative or positive) can stabilize or destabilize a system.
- Identify the structure and function of macromolecules common to all organisms and the chemical processes of synthesis and dehydration utilized to synthesize and decompose these complex molecules.

Essential Questions

- What does it mean to be alive?
- How do the structures of organisms enable life's functions?
- How does the structure of DNA determine the structure of proteins, and what is the function of proteins?
- How do feedback mechanisms maintain homeostasis?
- How do organisms obtain and use the matter and energy they need to live and grow?

Unit Summative Assessment and Alternate Assessment Options

The tools used to assess the following criteria for mastery will be, but are not limited to:

Quarterly exam, topic quizzes, chapter tests, projects, worksheets, and laboratory experiments.

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Macromolecules websites
- Homeostasis Websites
- Amoeba Sisters
- Bioman
- Crash Course

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments
Chemistry of Life (6 days)	• SWBAT identify the four basic types of biological macromolecules. • SWBAT describe the structure and function of simple and complex carbohydrates, giving examples of biologically important molecules. • SWBAT describe the structure and function of various types of biologically important lipids. • SWBAT describe the structure and function of biologically important proteins. • SWBAT investigate the	• Macromolecules Model • Macromolecules Lab • Enzymes and Macromolecules Activity	• Macromolecules Lab

	role of enzymes as catalysts for chemical reactions in the cell. • SWBAT describe structures and functions of nucleic acids.		
Hierarchical Structural Organization (1 day)	• SWBAT identify and describe the levels of organization at the multicellular level. • SWBAT model the interaction of the functions at the organism system level.	• Levels of organization activity	• Topic Assessment
Feedback Mechanisms (4 days)	• SWBAT explain how external and internal environmental conditions impact an organism's ability to stay alive. • SWBAT explain how metabolism and responsivenes s are mechanisms of	• Positive and Negative Feedback Activity • Homeostasis Activity	• Unit 1 Assessment

	homeostasis. • SWBAT investigate that provides evidence of feedback mechanisms in order to maintain homeostasis.		
Unit Review (2 days)	• SWBAT review the topics of Chemistry of life, Hierarchical Structural Organization, and Feedback Mechanisms	• Unit 1 Review	• Review Assessment
Unit Exam (1 day)	• SWBAT explain the topics of Chemistry of life, Hierarchical Structural Organization, and Feedback Mechanisms	• Unit 1 Assessment	• Unit 1 Assessment

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.HS-LS1-6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
SCI.HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

Suggested Modifications for Students with Disabilities, 504 eligible, Multilingual Learners, At Risk Students and Gifted Students

Special Education*:

- Collaboration between Content Education and Special Education teachers
- Preferential seating to minimize distractions
- Printed and highlighted notes
- Modified tests, quizzes, worksheets, and written assignments
- Repetition of directions and refocus activities
- Test, quiz, and assessment questions read aloud if needed
- Allow for extended time on assessments and assignments
- Alternative assessment formats (oral exams, project-based assessments)
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

504-Eligible Students*:

- Collaboration between teachers and support staff to ensure accommodations are met
- Preferential seating to minimize distractions
- Extended time on assessments and assignments
- Access to printed and highlighted notes
- Option for verbal or dictated responses on assignments and assessments
- Reduced workload or modified assignments as needed
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Alternative assessment formats (oral exams, project-based assessments)
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

Multilingual Language Learners (MLL):

- Collaboration between Content Education and ESL teachers
- Use of audio recordings when applicable
- Use of translation dictionaries when applicable
- Provide opportunities for oral responses and assessments
- Allow use of computer or other technological devices for assignments
- Highlight important notes and key concepts
- Use of graphic organizers to support comprehension
- Assign a peer liaison for additional support
- Incorporation of visual aids and real-world examples to reinforce concepts
- Modified assignments to focus on essential content
- Additional scaffolding such as sentence starters and guided practice

At-Risk Students:

- Small group instruction or one-on-one support when possible
- Clear, step-by-step instructions and modeling of tasks

- Use of engaging, real-world connections to make content more relevant
- Frequent feedback and progress monitoring
- Additional scaffolding (sentence starters, guided practice, visual supports)
- Peer mentoring and collaborative learning opportunities
- Encouragement of active participation through hands-on and interactive learning
- Flexible deadlines and opportunities for revision and reassessment
- Regular check-ins with teacher or counselor for academic and emotional support
- Positive reinforcement and goal-setting strategies to encourage motivation and engagement

Gifted Students:

- Provide more elaborate, complex, and in-depth study of major ideas and themes that integrate knowledge within and across the curriculum
- Incorporate outside sources (media, content, community resources) for further study that are thematic in nature
- Promote self-directed and self-initiated learning opportunities
- Allow for the development of productive thinking skills to encourage students to generate new knowledge
- Provide opportunities for leadership roles in collaborative projects
- Offer independent research projects and inquiry-based assignments
- Encourage critical analysis of multiple perspectives and interpretations of historical events

Computer Sci Design Thinking

CS.9-12.8.1.12.DA.1	Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.
CS.9-12.8.1.12.DA.5	Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
CS.9-12.8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.
CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.
CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.
CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.

Career Readiness, Life Literacies and Key Skills Practice

PFL.9.1.2.CR	Civic Responsibility
	There are actions an individual can take to help make this world a better place.
PFL.9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
PFL.9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.

WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.
WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.
TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.
TECH.9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
TECH.9.4.2.GCA	Global and Cultural Awareness
TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
	Digital tools can be used to display data in various ways.

Unit 2 Cells

Content Area: **Science**
Course(s): **Biological Life Science**
Time Period: **1st Marking Period**
Length: **5 weeks**
Status: **Awaiting Review**

Summary of the Unit

Students explore the question, *"How do the structures of organisms enable life's functions?"* by investigating the structure and function of cells as the fundamental unit of life. They examine how cells form specialized systems that work together to maintain life, growth, and development. Through critical reading, modeling, and hands-on investigations, students gain insight into the hierarchical organization of cells, tissues, and organ systems. They also analyze data and create models to understand the role of DNA and chromosomes in cellular division, highlighting how genetic information is passed from one generation to the next.

Enduring Understandings

- Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism.
- Through passive and active transport mechanisms, the cell maintains a balanced equilibrium.
- In multicellular organisms, individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow.
- The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells.
- Through the cell cycle, cells divide, specialize, and go through apoptosis. 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.

Essential Questions

- How do cell structures enable a cell to carry out basic life processes?
- How does a cell maintain homeostasis both within itself and as a part of a multicellular organism?
- How do cells know when, how, and to what extent perform their functions?
- How do organisms grow and develop?
- How does one cell give rise to two identical cells in order to allow for growth and development of an organism?
- What happens when the cell division process goes wrong?

Unit Summative Assessment and Alternate Assessment Options

The tools used to assess the following criteria for mastery will be, but are not limited to:

Quarterly exam, topic quizzes, chapter tests, projects, worksheets, and laboratory experiments (Lab Analysis/Experimental Design).

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Mitosis websites
- Meiosis websites
- Boman Website
- Amoeba Sisters Video

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments
Introduction to Cells (5 days)	• SWBAT distinguish between prokaryotic and eukaryotic cells. • SWBAT distinguish between plant and animal cells • SWBAT diagram the different organelles in a bacteria, plant and animal cell	• Notes on prokaryotes and eukaryotes • Prokaryote and eukaryote activity • Drag and drop plant and animal cell labelling activity • Organelle graphic organizer	• Chapter Quiz/Test

Cell Transport (5 days)	• SWBAT explain process of passive transport (diffusion, osmosis, facilitated diffusion), and active • Transport (endocytosis, exocytosis, and sodium potassium pump) in the movement of materials • through cell membranes. • SWBAT compare and contrast endocytosis and exocytosis.	• Notes on Passive and active transport with demos • Osmosis lab	• Chapter Quiz/Test
Cell Cycle/Cell Division (10 days)	• 1.SWBAT model and explain the significance of the cell cycle as it applies to asexual reproduction, growth and repair. • 2. Explain and model how the cell cycle is controlled. • 3. Compare and contrast how cancer cells differ from normal cells and understand the	• Cell cycle Notes • Webquest activity on Cell Cycle • Bioman Mitosis Activity • Cell Cycle Lab • Cancer Activity	• Chapter Quiz/Test

	underlying causes of uncontrolled cell growth		
Meiosis

(4 days) | • SWBAT analyze that inheritable genetic variations are the result of meiosis which creates daughter cells that have new combinations of genetic material as a result of crossing over. | • Meiosis Activity
• Meiosis model diagram
• Bioman Meiosis online Activity | • Meiosis Model Diagram |
| Review/ Assess

(3 days) | • Students will review information gained throughout the unit in preparation for an assessment
• Students will explain information gained throughout the unit | • Study Guide
• Review Game (task cards, Kahoot, quizzes, Blooket)
• Unit 2 Assessment | • Unit 2 Assessment |

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS.LS1.A	Structure and Function
SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS.LS1.B	Growth and Development of Organisms

Suggested Modifications for Students with Disabilities, 504 eligible, Multilingual Learners, At Risk Students and Gifted Students

Special Education*:

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- Test, quiz, and assessment questions read aloud if needed
- Allow for extended time on assessments and assignments
- Alternative assessment formats (oral exams, project-based assessments)
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Access to a quiet testing environment
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504-Eligible Students*:

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Multilingual Language Learners (MLL):

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At-Risk Students:

- Small group instruction or one-on-one support when possible
- Clear, step-by-step instructions and modeling of tasks
- Use of engaging, real-world connections to make content more relevant
- Frequent feedback and progress monitoring
- Additional scaffolding (sentence starters, guided practice, visual supports)
- Peer mentoring and collaborative learning opportunities

- Encouragement of active participation through hands-on and interactive learning
- Flexible deadlines and opportunities for revision and reassessment
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Gifted Students:

- Provide more elaborate, complex, and in-depth study of major ideas and themes that integrate knowledge within and across the curriculum
- Incorporate outside sources (media, content, community resources) for further study that are thematic in nature
- Promote self-directed and self-initiated learning opportunities
- Allow for the development of productive thinking skills to encourage students to generate new knowledge
- Provide opportunities for leadership roles in collaborative projects
- Offer independent research projects and inquiry-based assignments
- Encourage critical analysis of multiple perspectives and interpretations of historical events

Computer Sci Design Thinking

CS.9-12.8.1.12.DA.1	Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.
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CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
CS.9-12.8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.
CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.
CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.
CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.

Career Readiness, Life Literacies and Key Skills Practice

PFL.9.1.2.CR	Civic Responsibility
	There are actions an individual can take to help make this world a better place.
PFL.9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
PFL.9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.

WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.
WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.
TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.
TECH.9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
TECH.9.4.2.GCA	Global and Cultural Awareness
TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
	Digital tools can be used to display data in various ways.

Unit 3: DNA and Inheritance

Content Area: **Science**
Course(s): **Biology**
Time Period: **2nd Marking Period**
Length: **8-10 weeks**
Status: **Awaiting Review**

Summary of the Unit

In this unit, students explore why individuals within the same species vary in appearance, function, and behavior. They develop conceptual models to understand the role of DNA in the unity of life and use statistical models to explain the importance of variation within populations for species survival and evolution. Students examine the mechanisms of genetic inheritance, the causes of mutations, and how genetic and environmental factors influence gene expression. Additionally, they apply probability to analyze population trends and explain how advantageous heritable traits affect survival and reproduction in specific environments.

Enduring Understandings

- What is DNA, and how does it serve as the blueprint for life?
- How do genes and chromosomes determine the traits of an organism?
- How does an organism transfer the information contained in DNA to the proteins?
- Why do individuals of the same species vary in their physical traits, behaviors, and functions?
- How are traits passed from one generation to the next through genetic inheritance?
- What is the relationship between genetic variation and the survival of a species?
- How do mutations arise, and what role do they play in genetic diversity?

Essential Questions

- All cells contain genetic information in the form of DNA molecules.
- Genes are regions in the DNA that contain the instructions that code for the formation of proteins.
- Each chromosome consists of a single, very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA.
- The instructions for forming species' characteristics are carried in DNA.
- All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways.
- Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have, yet no known function.
- 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.
- Environmental factors also affect the expression of traits and hence affect the probability of occurrence of traits in a population.
- The variation and distribution of traits observed depends on both genetic and environmental factors.
- Empirical evidence is required to differentiate between cause and correlation and to make claims about inheritable genetic variations resulting from new genetic combinations through meiosis, viable errors occurring during replication, and/or mutations caused by environmental factors.

Unit Summative Assessment and Alternate Assessment Options

Assessments can include, but are not limited to the following:

- Research/Presentations Projects
- Group Projects
- Posters
- Labs
- Unit Assessments
- Section Quizzes
- Quarterly Exam
- Online Activities

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Genetics websites
- Codon Wheel
- Protein Synthesis websites
- Mutations websites
- Amoeba Sisters videos

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments

DNA (7 days)	• SWBAT clarify the relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. • SWBAT demonstrate an understanding of the structure of DNA by properly labeling a diagram or describing its molecular structure and bonding. • SWBAT model the process of DNA replication and state its significance to the mitotic process.	• DNA notes • DNA Model Activities (Paper, Candy, online) • DNA Extraction Lab • DNA Structure coloring WS • Replication Activity	• Model Activity Labs
RNA (3 days)	• SWBAT describe the process of Transcription and role of three types of RNA • SWBAT compare and contrast the	• Transcription notes • DNA/ RNA base pairing activity • DNA/RNA Graphic Organizer	• DNA/RNA Chapter Assessment

	nucleotides present in DNA and RNA.		
Protein Synthesis (7 days)	• SWBAT model the processes of transcription and translation, including the roles of DNA, • messenger RNA, transfer RNA and ribosomal RNA. • SWBAT explain how various combinations of the four nucleotides of DNA can ultimately code for thousands of different proteins. • SWBAT evaluate how gene sequence will affect the structure and function of a protein	• Translation Notes • Protein Synthesis Simulation • online Protein Synthesis Activity • Protein Synthesis Practice WS using codon wheel	• Protein Synthesis Activity • Chapter Assessment
Mutations (4 days)	• SWBAT explain what mutations are and differentiate between point mutations (e.g., substitution, insertion, deletion) and chromosomal mutations (e.g.,	• Mutation Notes • Mutation Lab (Online) • Mutation practice WS	• Mutation Lab

	duplication, inversion, translocation). • SWBAT explain that a mutation may or may not have an effect based on the amino acid sequence. • SWBAT use models to demonstrate how changes in the DNA sequence can alter mRNA and the resulting amino acid sequence during protein synthesis. • SWBAT construct a model based on evidence that connects gene sequence changes to genetic disorders.		
Genetics (15 days)	• SWBAT define genes and alleles and explain how they influence the inheritance of traits. • SWBAT predict the	• Punnett Square Practice Problems • Baby Dragon Genetics Lab • Monster Lab • Incomplete and codominance Practice WS	• Genetic Crosses • Genetics Lab • Chapter Assessment

		• ABO blood types	
	outcomes of monohybrid crosses using Punnett squares and probability rules. • SWBAT predict the different genetic crosses involving complete dominance, incomplete dominance, and sex-linkage		
Karyotype (5 days)	• SWBAT explain the structure and organization of a karyotype. • SWBAT use karyotypes to identify normal and abnormal chromosomal arrangements, including disorders such as Down syndrome (trisomy 21), Turner syndrome, and Klinefelter syndrome. • SWBAT use models or diagrams to demonstrate how errors during meiosis, such as nondisjunction, result in	• Analyze Karyotypes WS • Karyotype Lab • Sex-Linked Genetics Disorders • Punnett Square Practice	• Karyotype Lab • Chapter Assessment

	chromosomal abnormalities observable in karyotypes. • SWBAT relate sex linkage to humans using crosses to illustrate its importance in the transmission of abnormalities.		
Pedigree (5 days)	• SWBAT analyze and construct pedigrees to trace the inheritance of a specific trait or genetic disorder. • SWBAT identify carriers, affected individuals, and predict probabilities of inheritance for future offspring based on pedigree information.	• Create your own Pedigree Project	• Create your own Pedigree Project
Review/ Assess (2 days)	• Students will review information gained throughout the unit in preparation for an assessment	• 1.Study Guide • 2.Review Game (task cards, Kahoot, quizizz, Blooket)	• Unit 3 Assessment

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS.LS3.A	Inheritance of Traits
SCI.HS-LS3-2	Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
SCI.HS.LS3.B	Variation of Traits
SCI.HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Suggested Modifications for Students with Disabilities, 504 eligible, Multilingual Learners, At Risk Students and Gifted Students

Special Education*:

- Collaboration between Content Education and Special Education teachers
- Preferential seating to minimize distractions
- Printed and highlighted notes
- Modified tests, quizzes, worksheets, and written assignments
- Repetition of directions and refocus activities
- Test, quiz, and assessment questions read aloud if needed
- Allow for extended time on assessments and assignments
- Alternative assessment formats (oral exams, project-based assessments)
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

504-Eligible Students*:

- Collaboration between teachers and support staff to ensure accommodations are met
- Preferential seating to minimize distractions
- Extended time on assessments and assignments
- Access to printed and highlighted notes
- Option for verbal or dictated responses on assignments and assessments
- Reduced workload or modified assignments as needed
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Alternative assessment formats (oral exams, project-based assessments)
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

Multilingual Language Learners (MLL):

- Collaboration between Content Education and ESL teachers
- Use of audio recordings when applicable
- Use of translation dictionaries when applicable
- Provide opportunities for oral responses and assessments
- Allow use of computer or other technological devices for assignments

- Highlight important notes and key concepts
- Use of graphic organizers to support comprehension
- Assign a peer liaison for additional support
- Incorporation of visual aids and real-world examples to reinforce concepts
- Modified assignments to focus on essential content
- Additional scaffolding such as sentence starters and guided practice

At-Risk Students:

- Small group instruction or one-on-one support when possible
- Clear, step-by-step instructions and modeling of tasks
- Use of engaging, real-world connections to make content more relevant
- Frequent feedback and progress monitoring
- Additional scaffolding (sentence starters, guided practice, visual supports)
- Peer mentoring and collaborative learning opportunities
- Encouragement of active participation through hands-on and interactive learning
- Flexible deadlines and opportunities for revision and reassessment
- Regular check-ins with teacher or counselor for academic and emotional support
- Positive reinforcement and goal-setting strategies to encourage motivation and engagement

Gifted Students:

- Provide more elaborate, complex, and in-depth study of major ideas and themes that integrate knowledge within and across the curriculum
- Incorporate outside sources (media, content, community resources) for further study that are thematic in nature
- Promote self-directed and self-initiated learning opportunities
- Allow for the development of productive thinking skills to encourage students to generate new knowledge
- Provide opportunities for leadership roles in collaborative projects
- Offer independent research projects and inquiry-based assignments
- Encourage critical analysis of multiple perspectives and interpretations of historical events

Computer Sci Design Thinking

CS.9-12.8.1.12.DA.1	Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.
CS.9-12.8.1.12.DA.5	Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
CS.9-12.8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.
CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.
CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.

CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.

Career Readiness, Life Literacies and Key Skills Practice

PFL.9.1.2.CR	Civic Responsibility
	There are actions an individual can take to help make this world a better place.
PFL.9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
PFL.9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.
WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.
TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.
TECH.9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
TECH.9.4.2.GCA	Global and Cultural Awareness
TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.

TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
	Digital tools can be used to display data in various ways.

Unit 4: Matter and Energy Transformations in Ecosystems

Content Area: **Science**
Course(s): **Biological Life Science**
Time Period: **3rd Marking Period**
Length: **5 weeks**
Status: **Awaiting Review**

Summary of the Unit

In this unit of study, students construct explanations for the role of energy in the cycling of matter in organisms and ecosystems. They apply mathematical concepts to develop evidence to support explanations of the interactions of photosynthesis and cellular respiration, and they will develop models to communicate these explanations. Students also understand organisms' interactions with each other and their physical environment and how organisms obtain resources. Students are expected to use students construct explanations for the role of energy in the cycling of matter in organisms and ecosystems.

Enduring Understandings

- Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes.
- Plants or algae form the lowest level of the food web. At each link upward in a food web, only a small fraction of the matter consumed at the lower level is transferred upward to produce growth and release energy in cellular respiration at the higher level.
- There are generally fewer organisms at higher levels of a food web.
- Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded.
- Models can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.
- Photosynthesis and cellular respiration are important components of the carbon cycle, in which carbon is exchanged among the biosphere, atmosphere, oceans, and geosphere through chemical, physical, geological, and biological processes.
- The main way that solar energy is captured and stored on Earth is through the complex chemical process known as photosynthesis.

Essential Questions

- How and why do organisms interact with their environment and what are the effects of these interactions?
- How do matter and energy move through an ecosystem?
- What abiotic factors support life?

Unit Summative Assessment and Alternate Assessment Options

Assessments can include, but are not limited to the following:

- Research/Presentations Projects
- Group Projects
- Posters
- Labs
- Unit Assessments
- Section Quizzes
- Quarterly Exam
- Online Activities

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Photosynthesis Websites
- Cellular Respiration Websites
- Bioman Website
- Amoeba Sisters

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments
Flow of Energy Through an Ecosystem (4 days)	• SWBAT illustrate the transfer of energy from one trophic level to another in and ecosystem. • SWBAT explain how energy flows through an ecosystem. • SWBAT compare and contrast abiotic and biotic factors. • SWBAT evaluate different ecological pyramids to account for the	• Energy flow in ecosystems activity • Trophic level diagram • Ecological pyramid activity • 10% rule calculations	• Topic Assessment

	10% rule		
Photosynthesis (7 days)	• SWBAT illustrate the process of photosynthesis in aerobic and anaerobic conditions. • SWBAT investigate the process of photosynthesis and how it can affect an ecosystem. • SWBAT describe the main function of photosynthesisusing the following terms: light energy, chlorophyll, and, ATP.	• Photosynthesis diagram • Photosynthesis simulation lab • Photosynthesis activity	• Photosynthesis Lab • Photosynthesis Simulation
Cellular Respiration (7 days)	• SWBAT explain the process of cellular respiration. • SWBAT explain the difference between aerobic and anaerobic conditions. • SWBAT Compare and contrast alcohol fermentation and lactic acid synthesis to include the products formed, site of activity, and the conditions under which each will occur. • SWBAT model how food	• Cellular Respiration activity • Cellular Respiration lab • Fermentation Activity	• Cellular respiration lab

	molecules and oxygen transfer energy into the cell to sustain life processes.		
Food Webs (4 days)	• SWBAT construct and analyze a food web in an ecosystem. • SWBAT diagram how the energy flows through a food web in an ecosystem.	• Construct Food Web Diagram • Food Webs Activity	• Food Webs Activity
Unit 4 Review (2 days)	• SWBAT review topics from Unit 4	• Unit 4 Review • Unit 4 Assessment	• Unit 4 Assessment

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS-LS1-5	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
SCI.HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
SCI.HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.
SCI.HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
SCI.HS-LS2-5	Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
SCI.HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

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- Offer independent research projects and inquiry-based assignments
- Encourage critical analysis of multiple perspectives and interpretations of historical events

Computer Sci Design Thinking

CS.9-12.8.1.12.DA.1	Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.
CS.9-12.8.1.12.DA.5	Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
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CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.
CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.
CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.

Career Readiness, Life Literacies and Key Skills Practice

PFL.9.1.2.CR	Civic Responsibility
	There are actions an individual can take to help make this world a better place.
PFL.9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
PFL.9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.

WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.
TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.
TECH.9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
TECH.9.4.2.GCA	Global and Cultural Awareness
TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
	Digital tools can be used to display data in various ways.

Unit 5: Interdependent Relationships

Content Area: **Science**
Course(s): **Biology**
Time Period: **4th Marking Period**
Length: **3 weeks**
Status: **Awaiting Review**

Summary of the Unit

In this unit, students explore the interactions between organisms (biotic factors) and their environment (abiotic factors) to understand how ecosystems function and respond to change. They examine the interdependent relationships that shape ecosystems, including symbiosis, competition, predation, and group behavior. Through the lens of ecosystem dynamics and resilience, students analyze factors that influence population stability, biodiversity, and carrying capacity. Using mathematical reasoning and models, students investigate how energy flows through food webs and how matter cycles within ecosystems. They apply the crosscutting concepts of scale, proportion, and quantity to quantify population trends and resource availability, while stability and change provide a framework for understanding how ecosystems recover from disturbances. By engaging in data analysis and modeling, students develop proficiency in predicting and explaining ecosystem interactions.

Enduring Understandings

- Ecosystems have carrying capacities, which are limited to the number of organisms and populations they can support.
- These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, completion, and disease.
- Organisms would have the capacity to produce populations of great sizes were it not for the fact that environments and resources are finite.
- This fundamental tension affects the abundance (the number of individuals) of species in any given ecosystem.
- The significance of carrying capacity in ecosystems is dependent on the scale proportion and quantity at which it occurs.
- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions.
- If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem.
- Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.
- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions.

Essential Questions

- How do organisms interact with each other and their environment to maintain balance in an ecosystem?
- What factors determine the carrying capacity of an ecosystem for a given population?
- How do changes in one part of an ecosystem affect the whole system?

- How does energy flow through ecosystems, and how does it matter cycle within them?

Unit Summative Assessment and Alternate Assessment Options

Assessments can include, but are not limited to the following:

- Research/Presentations Projects
- Group Projects
- Posters
- Labs
- Unit Assessments
- Section Quizzes
- Quarterly Exam
- Online Activities

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Ecosystems Website
- Carrying Capacity data website
- Populations website
- Teacher Created Resources
- Amoeba sisters video

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments

Interdependent relationships in ecosystems (7 days)	• SWBAT determines how living organisms interact with both biotic (living) and abiotic (nonliving) components of their ecosystems, and these interactions shape population dynamics and ecosystem stability. • SWBAT describes how energy flows in one direction through ecosystems via food chains and food webs. • SWBAT explains how carrying capacity is determined by resource availability, competition, predation, and environmental factors, influencing the survival and reproduction of species.	• Biotic/Abiotic factor graphic organizer • Flow chart of levels of organization from smallest to largest. • Food Web Activity • Food Chain Station Activity • Notes on competition, Predator -Prey and Symbiotic relationship • Symbiotic Relationship Activity	• Chapter Assessment • Station Activity • Symbiotic Relationship Activity
Carrying Capacity of Ecosystems (7 days)	• SWBAT identify and explain how resource availability, competition,	• Notes on factors affecting population growth • Interpret and analyze exponential and	• Lab Assessment

	predation, and environmental conditions affect population growth and carrying capacity. • SWBAT apply mathematical representations, such as population growth curves (exponential vs. logistic), to describe and predict how populations change over time. • SWBAT investigate how factors such as habitat destruction, climate change, and disease influence population stability and biodiversity.	logistic growth curves • Hands-On Population Growth Simulation • Scenario or Case Study: Present a real-world example, such as the decline of honeybee populations due to habitat loss, climate change, and disease (colony collapse disorder). • Data Analysis – How Do Environmental Factors Affect Populations?	
Review/ Assess (2 days)	• Students will review information gained throughout the unit in preparation for an assessment	• Study Guide • Review Game (task cards, Kahoot, quizizz, Blooket)	• Unit 5 Assessment

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS-LS2	Ecosystems: Interactions, Energy, and Dynamics
SCI.HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
SCI.HS.LS2.A	Interdependent Relationships in Ecosystems
SCI.HS.LS2.C	Ecosystem Dynamics, Functioning, and Resilience
SCI.HS.LS2.B	Cycles of Matter and Energy Transfer in Ecosystems

Suggested Modifications for Students with Disabilities, 504 eligible, Multilingual Learners, At Risk Students and Gifted Students

Special Education*:

- Collaboration between Content Education and Special Education teachers
- Preferential seating to minimize distractions
- Printed and highlighted notes
- Modified tests, quizzes, worksheets, and written assignments
- Repetition of directions and refocus activities
- Test, quiz, and assessment questions read aloud if needed
- Allow for extended time on assessments and assignments
- Alternative assessment formats (oral exams, project-based assessments)
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

504-Eligible Students*:

- Collaboration between teachers and support staff to ensure accommodations are met
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- Breaks as needed to support focus and processing
- Alternative assessment formats (oral exams, project-based assessments)
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

Multilingual Language Learners (MLL):

- Collaboration between Content Education and ESL teachers
- Use of audio recordings when applicable
- Use of translation dictionaries when applicable

- Provide opportunities for oral responses and assessments
- Allow use of computer or other technological devices for assignments
- Highlight important notes and key concepts
- Use of graphic organizers to support comprehension
- Assign a peer liaison for additional support
- Incorporation of visual aids and real-world examples to reinforce concepts
- Modified assignments to focus on essential content
- Additional scaffolding such as sentence starters and guided practice

At-Risk Students:

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- Clear, step-by-step instructions and modeling of tasks
- Use of engaging, real-world connections to make content more relevant
- Frequent feedback and progress monitoring
- Additional scaffolding (sentence starters, guided practice, visual supports)
- Peer mentoring and collaborative learning opportunities
- Encouragement of active participation through hands-on and interactive learning
- Flexible deadlines and opportunities for revision and reassessment
- Regular check-ins with teacher or counselor for academic and emotional support
- Positive reinforcement and goal-setting strategies to encourage motivation and engagement

Gifted Students:

- Provide more elaborate, complex, and in-depth study of major ideas and themes that integrate knowledge within and across the curriculum
- Incorporate outside sources (media, content, community resources) for further study that are thematic in nature
- Promote self-directed and self-initiated learning opportunities
- Allow for the development of productive thinking skills to encourage students to generate new knowledge
- Provide opportunities for leadership roles in collaborative projects
- Offer independent research projects and inquiry-based assignments
- Encourage critical analysis of multiple perspectives and interpretations of historical events

Computer Sci Design Thinking

CS.9-12.8.1.12.DA.1	Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.
CS.9-12.8.1.12.DA.5	Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
CS.9-12.8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.
CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.

CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.
CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.

Career Readiness, Life Literacies and Key Skills Practice

PFL.9.1.2.CR	Civic Responsibility
	There are actions an individual can take to help make this world a better place.
PFL.9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
PFL.9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.
WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.
TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.
TECH.9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
TECH.9.4.2.GCA	Global and Cultural Awareness

TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
	Digital tools can be used to display data in various ways.

Unit 6:Human Activities and Biodiversity

Content Area: **Science**
Course(s): **Biology**
Time Period: **3rd Marking Period**
Length: **3 weeks**
Status: **Awaiting Review**

Summary of the Unit

In this unit of study, the mathematical models provide support for students' conceptual understanding of systems and students' ability to design, evaluate, and refine solutions for reducing the impact of human activities on the environment and maintaining biodiversity. Students create or revise a simulation to test solutions for mitigating adverse impacts of human activity on biodiversity. Mathematical models also provide support for students' conceptual understanding of systems and their ability to develop design solutions for reducing the impact of human activities on the environment and maintaining biodiversity.

Enduring Understandings

- The sustainability of human societies and the biodiversity that supports them require responsible management of natural resources.
- Anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.
- Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction).
- Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change.
- Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.
- Changes in the physical environment, whether naturally occurring or human induced, have contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline—and sometimes the extinction—of some species.
- Changes caused by human activity to ecosystems can shift populations and species distribution, sometimes past the point of return.

Essential Questions

- How do organisms interact in groups so as to benefit individuals?
- What can be done to reduce human impact on ecosystems to ensure that Earth will continue to support life?
- How have human activities and climate change shaped local and global ecology?

Unit Summative Assessment and Alternate Assessment Options

Assessments can include, but are not limited to the following:

- Research/Presentations Projects
- Group Projects
- Posters
- Labs and Activities
- Unit Assessments
- Section Quizzes
- Quarterly Exam
- Online Activities

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Bio Interactive Websites
- Biodiversity websites
- Climate Change Websites
- Amoeba Sisters
- Bioman Website

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments
Impacts of Human Activities on Environment (5 days)	• SWBAT research and propose a solution to decrease the negative effects of human activity on environment. • SWBAT investigate the effects of human activity in an	• Human Impact on Environment Activity	• Topic Assessment

	environment		
Human Impact on Biodiversity (5 days)	• SWBAT research and propose a solution to decrease the negative effects of human activity on biodiversity.	• Invasive species activity • Loss of Biodiversity Lab	• Topic Assessment
Climate Change (5 days)	• SWBAT make predictions about how a change to one species impacts ecological relationships within an ecosystem. • SWBAT illustrate trends and fluctuations in populations over time. • SWBAT propose and evaluate solutions to reduce the human impact on the environment	• Climate Change Models in Ecosystems • Population Trends Activity	• Topic Assessment
Unit 6 Review and Assessment (2 days)	• SWBAT review for topics in human activities and biodiversity. • SWBAT	• Unit 6 Assessment	• Unit 6 Assessment

		explain the topics in human activities and biodiversity		

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
SCI.HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
SCI.HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and climate change have influenced human activity.
SCI.HS-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.

Suggested Modifications for Students with Disabilities, 504 eligible, Multilingual Learners, At Risk Students and Gifted Students

Special Education*:

- Collaboration between Content Education and Special Education teachers
- Preferential seating to minimize distractions
- Printed and highlighted notes
- Modified tests, quizzes, worksheets, and written assignments
- Repetition of directions and refocus activities
- Test, quiz, and assessment questions read aloud if needed
- Allow for extended time on assessments and assignments
- Alternative assessment formats (oral exams, project-based assessments)
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Access to a quiet testing environment
- Organizational and time management support (checklists, graphic organizers, structured timelines)

504-Eligible Students*:

- Collaboration between teachers and support staff to ensure accommodations are met
- Preferential seating to minimize distractions
- Extended time on assessments and assignments
- Access to printed and highlighted notes
- Option for verbal or dictated responses on assignments and assessments
- Reduced workload or modified assignments as needed
- Use of assistive technology (speech-to-text, audiobooks, screen readers)
- Breaks as needed to support focus and processing
- Alternative assessment formats (oral exams, project-based assessments)
- Access to a quiet testing environment

- Organizational and time management support (checklists, graphic organizers, structured timelines)

Multilingual Language Learners (MLL):

- Collaboration between Content Education and ESL teachers
- Use of audio recordings when applicable
- Use of translation dictionaries when applicable
- Provide opportunities for oral responses and assessments
- Allow use of computer or other technological devices for assignments
- Highlight important notes and key concepts
- Use of graphic organizers to support comprehension
- Assign a peer liaison for additional support
- Incorporation of visual aids and real-world examples to reinforce concepts
- Modified assignments to focus on essential content
- Additional scaffolding such as sentence starters and guided practice

At-Risk Students:

- Small group instruction or one-on-one support when possible
- Clear, step-by-step instructions and modeling of tasks
- Use of engaging, real-world connections to make content more relevant
- Frequent feedback and progress monitoring
- Additional scaffolding (sentence starters, guided practice, visual supports)
- Peer mentoring and collaborative learning opportunities
- Encouragement of active participation through hands-on and interactive learning
- Flexible deadlines and opportunities for revision and reassessment
- Regular check-ins with teacher or counselor for academic and emotional support
- Positive reinforcement and goal-setting strategies to encourage motivation and engagement

Gifted Students:

- Provide more elaborate, complex, and in-depth study of major ideas and themes that integrate knowledge within and across the curriculum
- Incorporate outside sources (media, content, community resources) for further study that are thematic in nature
- Promote self-directed and self-initiated learning opportunities
- Allow for the development of productive thinking skills to encourage students to generate new knowledge
- Provide opportunities for leadership roles in collaborative projects
- Offer independent research projects and inquiry-based assignments
- Encourage critical analysis of multiple perspectives and interpretations of historical events

Computer Sci Design Thinking

CS.9-12.8.1.12.DA.1	Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.
CS.9-12.8.1.12.DA.5	Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among

different elements of data collected from a phenomenon or process.

CS.9-12.8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.
CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.
CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.
CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.

Career Readiness, Life Literacies and Key Skills Practice

PFL.9.1.2.CR	Civic Responsibility
	There are actions an individual can take to help make this world a better place.
PFL.9.1.2.CR.1	Recognize ways to volunteer in the classroom, school and community.
PFL.9.1.2.CR.2	List ways to give back, including making donations, volunteering, and starting a business.
PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.
WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.

TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.2	Create a document using a word processing application.
TECH.9.4.2.TL.3	Enter information into a spreadsheet and sort the information.
TECH.9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
TECH.9.4.2.GCA	Global and Cultural Awareness
TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
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	Digital tools can be used to display data in various ways.

Unit 7: Evolution

Content Area: **Science**
Course(s): **Biology**
Time Period: **4th Marking Period**
Length: **4 weeks**
Status: **Awaiting Review**

Summary of the Unit

In this unit, students construct explanations for the processes of natural selection and evolution and then communicate how multiple lines of evidence support these explanations. Students evaluate evidence of the conditions that may result in new species and understand the role of genetic variation in natural selection. The students will also be constructing explanations and designing solutions, analyzing and interpreting data, and engaging in argument from evidence investigate to make sense of the relationship between the environment and natural selection. Students also develop an understanding of the factors causing natural selection of species over time. They also demonstrate and understandings of how multiple lines of evidence contribute to the strength of scientific theories of natural selection.

Enduring Understandings

- Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment.
- The differential survival and reproduction of organisms in a population that have an advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not.
- Empirical evidence is required to differentiate between cause and correlation and make claims about how natural selection leads to adaptation of populations.
- Natural selection occurs only if there is both (1) variation in the genetic information between organisms in a population and (2) variation in the expression of that genetic information—that is, trait variation—that leads to differences in performance among individuals.
- Adaptation also means that the distribution of traits in a population can change when conditions change.
- Species become extinct because they can no longer survive and reproduce in their altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species' evolution is lost.
- Empirical evidence is required to differentiate between cause and correlation and make claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
- Group behavior has evolved because membership can increase the chances of survival for individuals and their genetic relatives.
- Empirical evidence is required to differentiate between cause and correlation and to make claims about the role of group behavior in individual and species' chances to survive and reproduce.
- Different patterns in multiple lines of empirical evidence may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations

of common ancestry and biological evolution.
- Evolution is a consequence of the interaction of four factors: (1) the potential for a species to increase in number, (2) the genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for an environment's limited supply of the resources that individuals need in order to survive and reproduce, and (4) the ensuing proliferation of those organisms that are better able to survive and reproduce in that environment.

Essential Questions

- How can there be so many similarities among organisms yet so many different plants, animals, and microorganisms?
- What evidence shows that different species are related?
- How are species affected by changing environmental conditions?
- How do we know that life has changed and will continue to change?
- How does genetic variation among organisms affect survival and reproduction?
- How is natural selection the driving force for evolution?

Unit Summative Assessment and Alternate Assessment Options

Assessments can include, but are not limited to the following:

- Research/Presentations Projects
- Group Projects
- Posters
- Labs and Activities
- Unit Assessments
- Section Quizzes
- Quarterly Exam
- Online Activities

Resources

Board approved textbook(s) and accompanying resources
Digital textbook access resources
Teacher generated/created resources
Student generated resources
Digital media and simulations including but not limited to the following:

- Bio Interactive website
- Evolution websites

Unit Plan

Topic/Selection	General Objectives	Instructional Activities	Benchmarks/Assessments

Timeframe			
Evolution (6 days)	• SWBAT explain the evolution is the result of the passing of heritable information that allows for variation in traits and leads to descent with modification. • SWBAT model how specific traits are given a competitive advantage over those both within and outside the species. • SWBAT analyze patterns in fossil records and presence of similar structures between evolutionary related species.	• Evidence of Evolution Activity • Evolution Simulation Lab	• Evolution Simulation Lab • Topic Assessment
Adaptations and Changes in Population (5 days)	• SWBAT construct an explanation based on roles how natural selection leads to adaptation of populations. • SWBAT organize the distribution of heritable traits over time and analyze the data of changing traits and shifts in populations.	• Adaptation Activity • Simulating Adaptations	• Topic Assessment
Natural Selection	• SWBAT explain how genetic mutation and	• Natural Selection Activity	• Topic Assessment

(6 days)	natural selection play a role in evolution • SWBAT analyze the factors that contribute to natural selection. • SWBAT identify and explain homologous,analogous, and vestigial structures in relation to evolution.	• Examples of Natural Selection Activity	
Changes in Environment (5 days)	• SWBAT evaluate the evidence that indicates the changes in the environment over time which can result in changes in the number of individuals in a species, the number of species in an environment and any changes to the environmental condition.	• Peppered Moth Lab • Evolution and Selection Activity	• Unit 7 Assessment • Peppered Moth Lab

Standards for Course Content Area and Cross Content Standards Addressed

SCI.HS-LS2-8	Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.
SCI.HS.LS2.D	Social Interactions and Group Behavior
SCI.HS-LS4	Biological Evolution: Unity and Diversity
SCI.HS.LS4.A	Evidence of Common Ancestry and Diversity
SCI.HS-LS4-2	Construct an explanation based on evidence that the process of evolution primarily result from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.
SCI.HS.LS4.B	Natural Selection
SCI.HS.LS4.C	Adaptation

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CS.9-12.8.2.12.EC.3	Synthesize data, analyze trends, and draw conclusions regarding the effect of a technolog on the individual, culture, society, and environment and share this information with the appropriate audience.
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PFL.9.1.2.RM	Risk Management and Insurance
PFL.9.1.2.RM.1	Describe how valuable items might be damaged or lost and ways to protect them.
WRK.9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements a the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
WRK.9.2.12.CAP.9	Locate information on working papers, what is required to obtain them, and who must sign them.
WRK.9.2.12.CAP.10	Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
WRK.9.2.12.CAP.11	Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
WRK.9.2.12.CAP.16	Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
TECH.9.4.2.CI	Creativity and Innovation
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT	Critical Thinking and Problem-solving
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorn ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3
TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
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TECH.9.4.2.GCA	Global and Cultural Awareness
TECH.9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
	Digital tools have a purpose.
	Critical thinkers must first identify a problem then develop a plan to address it to

effectively solve the problem.

Digital tools can be used to display data in various ways.