Branchburg Township Public Schools

Office of Curriculum and Instruction

Grade 6 Science Curriculum

Adopted by the Board of Education October 2022

This curriculum is aligned with the 2020 New Jersey Student Learning Standards in Science

Curriculum Scope and Sequence			
Content Area	Science	**Course Title/Grade Level:**	6th Grade Life Science

Topic/Unit Name		Suggested Pacing (Days/Weeks)
Topic/Unit #1	Introduction to Science The Engineering Design Process/Designing Model Membranes	September September-June
Topic/Unit #2	Cell Structures, Functions, and Processes	October - January
Topic/Unit #3	Heredity and Genetics	January - February
Topic/Unit #4	Ecology	March - May
Topic/Unit #5	Evolution and Natural Selection	May - June

Topic/Unit 1 Title	Introduction to Science The Engineering Design Process/Designing Model Membranes	Approximate Pacing	September September-June
STANDARDS			
Science Standards (NGSS)			
Students will be able to... MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the program. MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	Students will know… LS1.A: Structure and Function Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2) ETS1.A: Defining and Delimiting Engineering Problems The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1) ETS1.B: Developing Possible Solutions There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) ETS1.C: Optimizing the Design Solution Although one design may not perform the best across all tests, identifying the characteristics of the	Crosscutting Concepts Cause and Effect Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. Scale, Proportion, and Quantity Phenomena that can be observed at one scale may not be observable at another scale. Interdependence of Science, Engineering and Technology Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. Systems and System Models Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. Structure and Function Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.	

	design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)	

Interdisciplinary Connections:

ELA/literacy

RI.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings. (Example: Exploring prefix meaning and how they change root words in the metric system.)

SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study. (Example: Students will use microscopes to look closely at pond water and interpret that life exists in a form that they can't see. Example: Deciphering the meaning of cultural and scientific terms within a fictional text during engineering challenge)

RI.6.1. Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text. (Example: Research background information for building a water filter prototype.)

Mathematics

6.RP.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing. (Example: Students will convert data using the metric system.)

Computer Science & Design Thinking	Career Readiness, Life Literacies and Key Skills
8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. (Example: Students will discuss and use the steps in the engineering/design process to solve a problem.)	**9.4.8.GCA.2:** Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. (In small groups and as a class, students will discuss and hypothesize diverse solutions to the construction of model airplanes and the outcome of their flight distance - engineering/design process.)

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Why are there practices and processes that scientists use? To collect data and make conclusions.
How can the Engineering Design Process help scientists solve real-world problems? By creating, testing, and improving designs.

<table>
<tr><td colspan="2">What solutions exist to solve the problem of potable water shortage? Designing filters/”membranes.”</td></tr>
<tr><td colspan="2">STUDENT LEARNING OBJECTIVES</td></tr>
<tr><td>Key Knowledge</td><td>Process/Skills/Procedures/Application of Key Knowledge</td></tr>
<tr><td>Students will know:
Engineering/design process, hypothesis, conclusion, eyepiece, compound microscope, coarse adjustment, fine adjustment, arm, stage, clips, body tube, nose piece, objective lens, diaphragm, meter, liter, gram, mass, volume, kilo, hecto, deca, deci, centi, milli</td><td>Students will be able to:
● Understand and use the engineering design process to explore possible solutions to real life problems.
● Use microscopes to observe small organisms in high and low power.
● Discuss different microscopes and their technological advancements which have had important implications in scientific topics.</td></tr>
<tr><td colspan="2">ASSESSMENT OF LEARNING</td></tr>
<tr><td>Summative Assessment (Assessment at the end of the learning period)</td><td>● Chapter Quizzes/Tests</td></tr>
<tr><td>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</td><td><u>Introduction to Science Activities</u>:
● Metric graphing activity
● Engineering process Lab/activity conclusion questions (paper airplane)
● Identify parts of a microscopes
● Demonstrate use of microscopes
● Homework assignments
○ Vocabulary Flash Cards
○ Reading Comprehension
○ Worksheets to Reinforce Reading</td></tr>
<tr><td>Alternative Assessments (Any learning activity or assessment that asks students to perform to demonstrate their knowledge, understanding and proficiency)</td><td>● Interactive microscope website
● Science tool identification lab (Discuss inventions and discoveries made by scientists with disabilities when introducing science tools.)
● BrainPop Videos (Microscopes and Engineering Design Process)
● EDP - crash course kids video
● Pearson Interactive activities
● EdPuzzle
● Quizizz
● Graphing of paper airplane distances
<u>Engineering Design Process Activities</u>:
● Juan Daniel’s Futbol Frog - Edpuzzle</td></tr>
</table>

	• Observe/demos of real life membranes - peas, egg, raisins, vacuum filters, nicotine patch • Research background information - purpose of membranes and filters, types of materials to create filter for purifying water, compare membranes and filters • Planning prototype of filter/membrane, designing prototype, and test prototype • Draw conclusions and summarize results/make improvements on design
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• Grade level benchmark assessment: Evidence based short response assessments
RESOURCES	
Core instructional materials: • Pearson Elevate Life Science Textbook (2019) • Scientific Articles • Microscope diagrams	
Supplemental materials: • BrainPop videos • Physical materials for labs - paper airplane lab, assorted slides for microscopes, materials for water filter	
Modifications for Learners	
See appendix	

Topic/Unit 2	Cell Structures, Functions and Processes	Approximate Pacing	October - January

STANDARDS		
Science Standards (NGSS)		
Students will be able to...	Students will know…	Crosscutting Concepts
MS-LS 1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. [Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.] MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. [Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.] [Assessment Boundary: Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical function of cells or cell parts.] MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. [Clarification Statement: Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.] [Assessment Boundary: Assessment does not include the mechanism	LS1.A: Structure and Function All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1) Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2) In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3) LS1.C: Organization for Matter and Energy Flow in Organisms Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. (MS-LS1-6) Within individual organisms, food moves through a series of chemical reactions in which it is broken	Cause and Effect Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8) Scale, Proportion, and Quantity Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1) Systems and System Models Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3) Energy and Matter Matter is conserved because atoms are conserved in physical and chemical processes. (MS-LS1-7) Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6) Structure and Function Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural

of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.] MS-LS1-6 Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. [Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.] [Assessment Boundary: Assessment does not include the biochemical mechanisms of photosynthesis.] MS-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. [Clarification Statement: Emphasis is on describing that molecules are broken apart and put back together and that in this process, energy is released.] [Assessment Boundary: Assessment does not include details of the chemical reactions for photosynthesis or respiration.] MS-LS1-8 Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. [Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.] MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	down and rearranged to form new molecules, to support growth, or to release energy. (MS-LS1-7) LS1.D: Information Processing Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (MS-LS1-8) (SLO 4 PS3.D: Energy in Chemical Processes and Everyday Life The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. (secondary to MS-LS1-6) Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.(secondary to MS-LS1-7) ETS1.A: Defining and Delimiting Engineering Problems The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)	structures/systems can be analyzed to determine how they function. (MS-LS1-2)

Interdisciplinary Connections:	
ELA/Literacy **WHST.6-8.1** Write arguments focused on discipline content. (MS-LS1-3) (Example: Students will develop an argument explaining that the body is a system composed of subsystems containing cells.) SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MSLS1-2) (Example: Students create 3-D cell models and a presentation explaining the function of the structures within a cell.) Mathematics **6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MSLS1-2),(MS-LS1-3) (Example: Analyze quantitative relationships during cell division)	
Computer Science & Design Thinking	**Career Readiness, Life Literacies and Key Skills**
8.2.8.ETW.2: Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital). (Students will analyze the materials used in the processes of photosynthesis and respiration. They will analyze the impact of not having the correct materials to perform the function.)	**9.4.8.DC.2:** Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). (Students will appropriately cite digital resources used for research to complete their body system slide show project) **9.4.8.TL.3:** Select appropriate tools to organize and present information digitally (Students will choose a digital tool they would like to use to present parts and processes that occur in a cell.)
UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS	
Topic 1: How do scientists define and organize living things? **Living things are classified based on similar characteristics.** **Topic 2:** How does the structure of cells determine their function? **Animal cells are shaped differently than plant cells.** **Topic 3:** How do systems interact in the human body? **Body systems work together in order to perform multiple tasks.**	
STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**

Students will know:	***Students will be able to:***
Topic 1: organism, cell, unicellular, multicellular, stimulus, response, spontaneous generation, homeostasis **Topic 2:** cell, microscope, cell theory, organelle, cell wall, cell membrane, cytoplasm, nucleus, mitochondria, chloroplast, vacuole, selectively permeable, diffusion, osmosis, endocytosis, exocytosis, cell cycle, interphase, replication, mitosis, cytokinesis, photosynthesis, autotroph, heterotroph, chlorophyll, cellular respiration **Topic 3:** tissue, organ, organ system, stimulus, response, gland, hormone, stress, digestion, nutrients, carbohydrates, saliva, enzyme, circulatory system, artery, capillary, vein, lymph, bronchi, excretion, neuron, synapse, brain, spinal cord, reflex	**Topic 1:** ● Provide evidence that supports living things are made of cells and what living things need to stay alive, grow and reproduce. **Topic 2:** ● Explore the components of cell theory, understand that cells are the basic units of life, and cells of all living things extract energy from food, get rid of waste and reproduce ● Provide evidence that all living things are made up of cells and distinguish between living and nonliving things based on the presence or absence of cells ● Identify structures of a plant and animal cell and their function ● Explain cause and effect relationships of cell division and describe the phases ● Explain and model photosynthesis and cellular respiration and how matter is transferred and conserved **Topic 3:** ● Explain the organization of the body ● Compare the structure and function of the body systems ● Model the systems and the organs in each ● Explain the interactions of the body systems

ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	● Cells test ● Cell processes test ● Body systems test ● Chapter quizzes ● Vocabulary
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	● Living vs non-living thing investigation - investigation to determine if items are alive, dead or non-living ● Create a cell theory timeline (When teaching about microorganisms and looking at them under the microscope students will be introduced to the African American microbiologist Harold Amos - he is from NJ and had a connection to quakers where he learned about Luis Pasteur.) ● Finding a specimen using a compound microscope - use various prepared slides of living things to understand how the microscope works

	● Creating a prepared slide of living cells - use plant parts, cheek cell scrapings, etc and create slides to identify cells ● Making detailed scientific drawings during microscope labs - learn to draw to scale what they see under the microscope ● Modeling photosynthesis and cellular respiration - use the molecular set to build photosynthesis and respiration ● Cell Processes Dinner Menu - project where students have choice to demonstrate knowledge of cell processes ● Cell types investigation - students create an investigation to determine that cells vary ● Dissections (Sponge, Sheep's heart, Worm, Grasshopper, Brain, Frog) ● Dissection conclusion questions ● Homework ○ Reading comprehension ○ Vocabulary flashcards ○ Worksheets to reinforce reading
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	● Cell Model Project - create a 3D model of a plant or animal cell (all organelles must be included and definitions of the organelles typed up) ● Cell organelle analogies - compare the organelles to the parts of a city or school ● Discovery Education interactive cell organelle game - interactive game with student worksheet ● Cells Webquest - interactive game with student worksheet ● Modeling diffusion - use a balloon, perfume, food coloring, etc to model diffusion ● Eggmosis - use de-shelled eggs in water and corn syrup to show osmosis into and out of the egg ● Photosynthesis Gizmo - plants and snails gizmo ● Human Body Systems Project - project to research a body system and present it to class (Teach students about Edwin Krebs who was a biochemist who had to overcome the disability of being hearing impaired. He made discoveries in cells that led to better understanding of hormones.) ● Bacteria Growth Lab - grow bacteria in petri and test with antibacterial soap (done during immune system) ● EdPuzzle ● Kahoot/Socrative ● Pearson Interactive activities ● Wizer.me worksheets ● BrainPop ● Graphing respiration (CO_2 levels)

	• Graphing Bacteria
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	Grade level benchmark assessment: Evidence based short response assessments
RESOURCES	
Core instructional materials: • Pearson Elevate Life Science Textbook (2019) • Scholastic Magazines • Cell models • System models • Readworks	
Supplemental materials: • EdPuzzle • Kahoot/Socrative • Explore Learning Gizmos https://www.explorelearning.com/ • Dissection 101 website • Biology Corner website • Previous student-created resources/projects • Discovery Education • www.brainpop.com • Physical materials for labs - specimens for dissections, dissection tools	
Modifications for Learners	
See appendix	

Topic/Unit 3 Title	Heredity and Genes	Approximate Pacing	January - February

STANDARDS

Science Standards (NGSS)

Students will be able to…	Student will know…	Crosscutting Concepts
MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. [Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.] [Assessment Boundary: Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.] 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.[Clarification Statement: Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.] [Assessment Boundary: Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.] 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. [Clarification Statement:	LS1.B: Growth and Development of Organisms Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MS-LS3-2) LS3.A: Inheritance of Traits Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. (MS-LS3-1) Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (MS-LS3-2) LS3.B: Variation of Traits In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. (MS-LS3-2)	Cause and Effect Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3-2) Structure and Function Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS3-1)

Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.] MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the program. MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism. (MS-LS3-1) LS1.B: Growth and Development of Organisms Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4) Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (MS-LS1-4) Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5) ETS1.B: Developing Possible Solutions There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) ETS1.C: Optimizing the Design Solution Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)	

Interdisciplinary Connections:	
ELA/Literacy **RST.6-8.2** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (MS-LS1-5),(MS-LS1-6) (Example: Ask students to explain Mendel's experiments, the data he recorded, and how this led to his conclusions.) **RST.6-8.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics. (MS-LS3-1),(MS-LS3-2) (Example: Students will understand the symbols used to represent DNA and the protein codes.) Mathematics **MP.4** Model with mathematics. (MS-LS3-2) **7.SP.C.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. (Example: Students will use Punnett Squares to help determine the probability of outcomes of offspring) **7.SP.C.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (Example: Students will use Punnett Squares to help model the probability of outcomes of offspring)	
Computer Science & Design Thinking	**Career Readiness, Life Literacies and Key Skills**
8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. (Students will explore how advances in genetics may cause ethical issues, such as genetically modifying organisms that can be harmful to that specific organism - hybridization, cloning.)	**9.2.8.CAP.10:** Evaluate how careers have evolved regionally, nationally, and globally. (Discuss careers related to genetics such as genetic counseling, farming, genetic engineering, gene therapy)
UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS	
Topic 4 & 7: How do offspring receive traits from their parents? **Students will model and observe how two of the same parents pass down different traits to separate offspring.**	
STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**

Students will know: **Topic 7:** inheritance, sexual and asexual reproduction, trait, gene, heredity, dominant allele, recessive allele, probability, genotype, phenotype, chromosome, cell cycle, pedigree, mitosis, DNA, variation, sex chromosomes, autosomal chromosomes, mutation, sex-linked genes, artificial selection, genetic engineering, gene therapy, clone, genome	***Students will be able to:*** ● Explain how organisms reproduce and pass down traits to offspring. ● Analyze the cause and effect relationship between the inheritance of half of an offspring's genes from each parent and how this leads to variation in traits. ● Examine the history of Gregor Mendel's contributions to genetics and inheritance ● Develop and use a model to predict the probability of inheritance of specific genetic variations ● Differentiate between genes, alleles, and chromosomes and determine how they are related ● Use a model to demonstrate and describe the cause and effect of the influence of pedigree on variations in inherited traits across generations ● Construct explanations for how and why cells undergo DNA replication ● Determine sex-linked trait inheritance using a Punnett Square ● Construct a model to show how a genetic mutation occurs ● Gather and synthesize information to explain advances in genetics
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	● Lesson Quizzes ● Chapter Tests ● Conclusion Questions for DNA Model and other labs
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	● Genetics Think-Tac-Toe - differentiated choice board project ● Gizmo student guides ● Zork Genetics and Punnett Squares ● DNA Model - using candy students accurately create a DNA model ● Predicting inheritance using Punnett Squares ● Homework assignments ○ Vocabulary Flash Cards ○ Reading Comprehension ○ Worksheets to Reinforce Reading
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to	● Genetic Heads - apply rules of heredity to create an online unique character from a set of parents ● Building DNA Gizmo ● Inheritance Gizmo

demonstrate their knowledge, understanding and proficiency)	• Human Karyotyping Gizmo (genetic disorder on sex chromosomes, people with XXY or XXX, how this impacts their gender identity and struggles they have growing up) • Creating a pedigree - given a scenario of a family students will create a family pedigree • Click and Clone Mouse - virtual activity • Reading A-Z articles - ex: “Are GMO’s Safe?” • Pearson Interactivities • Wizer.me • EdPuzzle • BrainPop • Black History Month Project highlighting notable African American scientists
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	Grade level benchmark assessment: Evidence based short response assessments
RESOURCES	
Core instructional materials: • Pearson Elevate Life Science Textbook 2019 • Scholastic Magazines • DNA Models • Readworks	
Supplemental materials: • www.brainpop.com • Explore Learning Gizmos https://www.explorelearning.com/ • Newsela • Reading A-Z • YouTube (ex - Amoeba Sisters, Kurtzgesagt) • EdPuzzle • Kahoot/Socrative • Discovery Ed • Physical materials for labs - DNA beads and pipecleaners, genetic head coins	
Modifications for Learners	
See appendix	

Topic/Unit 4 Title	Ecology	Approximate Pacing	March - May
STANDARDS			
Science Standards (NGSS)			

Students will be able to...	Student will know…	Crosscutting Concepts
MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources. MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.] MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.] MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]	LS2.A: Interdependent Relationships in Ecosystems Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1) In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1) Growth of organisms and population increases are limited by access to resources. (MS-LS2-1) Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2) LS2.B: Cycle of Matter and Energy Transfer in Ecosystems Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the	Patterns Patterns can be used to identify cause and effect relationships. (MS-LS2-2) Cause and Effect Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1) Energy and Matter The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3) Stability and Change Small changes in one part of a system might cause large changes in another part. (MS-LS2-4),(MS-LS2-5)

MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.* [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.] MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. [Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.] MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3) LS2.C: Ecosystem Dynamics, Functioning, and Resilience Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4) Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5) LS4.D: Biodiversity and Humans Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.(secondary to MS-LS2-5) ETS1.A: Defining and Delimiting Engineering Problems The more precisely a design task's criteria and constraints can be defined, the more likely it is	

	that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1) <u>ETS1.B: Developing Possible Solutions</u> There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3), (secondary to MS-LS2-5) Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) <u>ETS1.C: Optimizing the Design Solution</u> Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)	

Interdisciplinary Connections:

<u>ELA/Literacy</u>

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-3) (Example: Students will locate in the text ideas that support a question about population limiting factors.)

RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (MS-LS1-5),(MS-LS1-6) (Example: Students brainstorm a list of as many ecosystems as they can think of. They will then use the textbook to find main ideas to support the reasons for their ecosystem choices)

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS2-1) (Example: Students will use diagrams and models of ecosystem life cycles to understand that matter is recycled through an ecosystem)
WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS2-2) (Example: Students will brainstorm everything they know about water before they learn about the water cycle)
SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MSLS1-2) (Example: Students will use diagrams and models of ecosystem life cycles to understand that matter is recycled through an ecosystem)

Mathematics
6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS2-3) (Example: Students will use data generated form a wolf population game to create multiple graphs to analyze the change in wolf population over time)
7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. (Example: Students will analyze proportional relationships in energy pyramid)

Computer Science & Design Thinking	Career Readiness, Life Literacies and Key Skills
8.1.8.DA.3: Identify the appropriate tool to access data based on its file format (Example: Students will use data from their wolf population game to create and analyze graphs in Google sheets.) **8.2.8.ETW.2:** Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital). (Students will analyze various cycles in an ecosystem and determine the impact modifying these cycles would have on the system - yellowstone national park wolf population.)	**9.4.8.CT.3:** Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome (Students will collaborate to investigate the real world problem of wolf endangerment and the solutions that have been implemented to save the wolf population.) **9.4.8.CI.2:** Repurpose an existing resource in an innovative way (Students will utilize their knowledge of adaptations to create an animal for a future environment.)

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Topic 6: How do living and nonliving things affect one another? **Over 20 years ago, wolves were reintroduced to Yellowstone National Park**

after a 70-year absence. Over that same 20-year time period the ecosystem has changed dramatically.

Topic 5: How are matter and energy cycled in an ecosystem? **When the water is boiled it evaporates and turns back into water we can see.**

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: **Topics 6:** niche, competition, predation, symbiosis, commensalism, mutualism, parasitism, succession, pioneer species, biodiversity, keystone species, extinction, invasive species, ecology, natural resource, conservation, sustainability, ecological restoration, **Topic 5:** organism, habitat, biotic factor, abiotic factor, population, community, ecosystem, limiting factor	***Students will be able to:*** **Topic 6:** ~ Analyze and interpret data to predict the cause and effect of the amount and availability of a given resource on its population. ~ Identify and describe interactions among populations and how that may impact the population size. ~ Construct explanations of patterns in population changes and the environment ~ Cite textual evidence to explain biodiversity and the factors that affect it ~ Explain that human impact can disrupt the stability of the environment. (gw) **Topic 5:** ~ Analyze and interpret data to provide evidence that changes in the availability of resources affect populations within an ecosystem ~Analyze cause and effect relationships to predict how size of population affects availability of resources ~ Make models to identify and describe how energy and matter is transferred and conserved to maintain stability within an ecosystem (gw)

ASSESSMENT OF LEARNING

Summative Assessment (Assessment at the end of the learning period)	● Ecology quizzes/tests ● Graphing activities
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	● Lorax Intro activity (Holocaust - relate the destruction of rainforest to the genocide of human beings and the effect it has) ● Wolf population activities ○ Data collection/analysis activities ● Animal Adaptation Project - create a unique animal designed to live in a futuristic environment ● Food Webs/Chains - build a food web using a given set of cards ● Modeling Cycles of matter and energy (Climate change - how different climates are changing ecosystems, animals.)

	○ Water cycle - boiling water/water cycle interactivity ○ Nitrogen cycle ○ Carbon/oxygen cycle ● Biome Virtual Field Trips ● Ecology Escape Room ● Owl Pellet Dissection
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	● BrainPop - short biome movies ● Prairie Ecosystem Gizmos ● Wolf population activities ○ Data collection/analysis activities ● Pixel Art activities ● Pearson Interactivity ● EdPuzzle ● Homework assignments ○ Vocabulary Flash Cards ○ Reading Comprehension ○ Worksheets to Reinforce Reading
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	Grade level benchmark assessment: Evidence based short response assessments
RESOURCES	
Core instructional materials: ● Pearson Elevate Life Science textbook 2019 ● Scholastic Magazines	
Supplemental materials: ● Explore Learning Gizmos https://www.explorelearning.com/ ● www.brainpop.com ● Discovery Education - discoveryeducation.com ● YouTube ● Readworks ● National Geographic	

● Population websites (ex- http://worldpopulationhistory.org/) ● Physical materials for labs - boiling water demo, owl pellets, dice for wolf population game
Modifications for Learners
See appendix

Topic/Unit 5 Title	Evolution and Natural Selection	Approximate Pacing	May - June

STANDARDS

Science Standards (NGSS)

Students will be able to...	Student will know…	Crosscutting Concepts
MS-LS4-1 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. [Clarification Statement: Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers.] [Assessment Boundary: Assessment does not include the names of individual species or geological eras in the fossil record.] MS-LS4-2 Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. [Clarification Statement: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures.] MS-LS4-3 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. [Clarification Statement: Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.] [Assessment Boundary: Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.]	LS4.A: Evidence of Common Ancestry and Diversity The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth. (MS-LS4-1) Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. (MS-LS4-2) Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy. (MS-LS4-3) LS4.B: Natural Selection Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4) In artificial selection, humans have the capacity to influence certain characteristics of organisms by	Patterns Patterns can be used to identify cause and effect relationships. (MS-LS4-2) Graphs, charts, and images can be used to identify patterns in data. (MS-LS4-1),(MS-LS4-3) Cause and Effect Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS4-4),(MS-LS4-5),(MS-LS4-6)

MS-LS4-4 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. [Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.] MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. [Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.] MS-LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. [Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, gene therapy); and, on the impacts these technologies have on society as well as the technologies leading to these scientific discoveries.]	selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring. (MS-LS4-5) LS4.C: Adaptation Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes. (MS-LS4-6) ETS1.B: Developing Possible Solutions There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) ETS1.C: Optimizing the Design Solution Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)	

MS-LS4-6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability statements, and proportional reasoning to support explanations of trends in changes to populations over time.] [Assessment Boundary: Assessment does not include Hardy Weinberg calculations.] MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.		

Interdisciplinary Connections:

ELA/Literacy

RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.(MS-LS4-3),(MS-LS4-4) (Example: After reading an evolution article and watching a video from EdPuzzle students will complete questions about Darwin and evolution.)

SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. (MS-LS2-2) (Example: After many discussions students will work together to organize a set of embryos for 5 different animals.)

Mathematics

7.RP.A.2 Recognize and represent proportional relationships between quantities. (MS-LS4-4),(MS-LS4-6) (Example: Students will analyze graphs about various organisms and their interactions with each other and their environment.)

Computer Science & Design Thinking	Career Readiness, Life Literacies and Key Skills
8.2.8.ITH.2: Compare how technologies have influenced society over time (Students will determine how advances in engineering technology have allowed humans to affect the	**9.4.8.CI.3**: Examine challenges that may exist in the adoption of new ideas (Students will explore changing environments and the impact it has on animal characteristics and survival.)

development of new traits displayed in species - artificial selection.)	

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Topic 8: How do characteristics change over time? **Characteristics of similar animal species look different depending on where they live.**

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: species, evolution, fossil, adaptation, scientific theory, mechanism, natural selection, competition, fitness, sexual selection, coevolution, fossil record, embryo, homologous structures, extinct, protein, endosymbiosis	***Students will be able to:*** ~ Identify and describe patterns that explain how organisms can change over time ~ Construct an explanation to support the theory of evolution ~ Provide evidence of how natural selection leads to evolution ~ Use mathematical representations to support explanations of how natural selection and inherited variations influence a population ~ Investigate the cause and effect relationship between species interaction and its influence on evolution ~ Analyze patterns of embryological development across multiple species to identify what the early development of organisms tells us about evolution

ASSESSMENT OF LEARNING

Summative Assessment (Assessment at the end of the learning period)	● Chapter Quizzes/Tests
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	● Embryo comparison - use a chart of various embryos to show similarities, differences and changes over a few weeks (Teach students about breaking down barriers between races by connecting human embryos to other humans and other animals.) ● Gizmo student guides ● Lab/activity conclusion questions ● Homework assignments ○ Vocabulary Flash Cards ○ Reading Comprehension ○ Worksheets to Reinforce Reading ● Graphing Activity - SGO Post Assessment

Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Natural/Artificial Selection Gizmo OR Natural Selection Gizmo (Peppered Moths) • Rainfall/Bird Beak Gizmo • EdPuzzle interactive website • Readworks Article "A Bird With Many Beaks" with written response • Bird Beak Activity - simulation of natural selection where students use various tools to pick up seeds of different sizes • Skull comparison and measurement - use set of 8 skull models to understand evolution • Identify scenarios that lead to speciation • http://www.biologycorner.com/worksheets/peppermoth_paper.html
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	Grade level benchmark assessment: Evidence based short response assessments
RESOURCES	
Core instructional materials: • Imax movie - Darwin • Pearson Elevate Life Science textbook 2019	
Supplemental materials: • Natural Selection resources • Peppered moth simulation • EdPuzzle • Socrative website • Explore Learning Gizmos https://www.explorelearning.com/ • National Geographic • ReadWorks Articles	
Modifications for Learners	
See appendix	