HAZLETON AREA SCHOOL DISTRICT

SCIENCE CURRICULUM

8th Grade

2023

Grade 8 Science **Hazleton Area School District**

Quarter 1: Physical Sciences

Unit 1: Structure and Properties of Matter

Standards (Established Goals):

Standard 3.2.6-8.B
• Develop a model that predicts and describes changes in the particle motion, temperature and state of a pure substance when thermal energy is added or removed.
  ○ **Clarifying Statement:** Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawing and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.
  ○ **Assessment Boundary:** N/A

Enduring Understandings	**Essential Questions**
Big Ideas: • All forms of matter exist as a result of the combination or rearrangement of atoms. **Crosscutting Concepts:** • Cause and effect. Relationships may be used to predict phenomena in natural or designed systems.	• How do particles combine to form the variety of matter one observes?

The students will know	**Enrichment Standards**
Vocabulary: • Gas, liquid, solid, molecular motion, temperature, thermal energy, heat, phase change (boiling, melting, freezing, sublimation) pressure,	**Science and Engineering Practices** • Students will be able to develop a model to predict and/or describe phenomena.

temperature, potential energy, kinetic energy, pure substance

- Technology and Engineering Vocab: research and development, systematic test, refinement, closed-loop system

Disciplinary Core Ideas:

- Gasses and liquids are made of molecules or inert atoms that are moving about relative to each other. In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.
- The term "heat" as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects.
- The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system's material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material.
- Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material (secondary).

Environmental Literacy & Sustainability Standards

- N/A

Technology & Engineering Standards

- **3.5.6-8.DD** Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements.
- **3.5.6-8.HH** Create an open-loop system that has no feedback path and requires no human intervention.

Unit 2: Atomic Structure

Standards (Established Goals):

Standard 3.2.6- 8.A
• Develop models to describe the atomic composition of simple molecules and extended structures.
  ○ **Clarifying Statement**: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms.
  ○ **Assessment Boundary**: Assessment does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete description of all individual atoms in a complex molecule or extended structure is not required.

Enduring Understandings	**Essential Questions**
Big Ideas: • All forms of matter exist as a result of the combination or rearrangement of atoms. **Crosscutting Concepts:** • Scale, Proportion, and Quantity. Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	• How do particles combine to form the variety of matter one observes?

The students will know	**Enrichment Standards**
Vocabulary: • Atoms, molecules, bonding, compounds, elements • Technology and Engineering: historical era, technological advancement, human progress, input, resource, output, feedback **Disciplinary Core Ideas:** • Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. Solids may be formed from molecules, or they may be extended structures with repeating subunits.	**Science and Engineering Practices** • Students will be able to develop a model to predict and/or describe phenomena. **Environmental Literacy & Sustainability Standards** • N/A **Technology & Engineering Standards** • **3.5.6-8.CC** Consider historical factors that have contributed to the

	development of technologies and human progress. • **3.5.6-8.EE** Differentiate between inputs, processes, outputs, and feedback in technological systems.

Quarter 2: Physical Sciences

Unit 3: Chemical Reactions

Standards (Established Goals):

Standard 3.2.6-8.C

- Gather and make sense of information to describe how synthetic materials come from natural resources and impact society.
  - **Clarifying Statement:** Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.
  - **Assessment Boundary:** Assessment is limited to qualitative information

Standard 3.2.6-8.D

- Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
  - **Clarifying Statement:** Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride.
  - **Assessment Boundary:** Assessment is limited to analysis of the following properties: density, melting point, boiling point, solubility, flammability, and odor

Standard 3.2.6-8.E

- Develop and use a model to describe how to the total number of atoms does not change in a chemical reaction and thus mass is conserved.
  - **Clarifying Statement:** Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms, that represent atoms.
  - **Assessment Boundary:** Assessment does not include the use of atomic masses, balancing symbolic equations, or intermolecular forces

Standard 3.2.6-8.F

- Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.
  - **Clarifying Statement:** Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.
  - **Assessment Boundary:** Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device

Enduring Understandings	Essential Questions
Big Ideas: • The atoms of some substances combine or rearrange to form new substances that have different properties. **Crosscutting Concepts:** • Structure and Function- Structure can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. • Patterns- Macroscopic patterns are related to the nature of microscopic and atomic level structure. • Energy and Matter-Matter is conserved because atoms are conserved in physical and chemical processes. • Energy and Matter- The transfer of energy can be tracked as energy flows through a designed or natural system.	• How do substances combine or change (react) to make new substances? • How does one characterize and explain these reactions and make predictions about them?

The students will know	Enrichment Standards
Vocabulary: • Reactants, molecules, substance, synthetic material, natural resource, Reactants, products, precipitate, chemical change, mixture, compounds, yields, physical properties, chemical properties, Chemical equation, conservation of mass, open vs. close, system, yields, reactants, products, Electrical, endothermic, exothermic • Technology and Engineering: technologically literate, instruments, data, products, systems thinking, relationship, environment, invention, innovation, beneficial, solution, positive impact, negative impact, device, vehicle, characteristics, systematic processes, criteria, constraints, criteria, accuracy, precision, judgement, iteration, design thinking process, limitation, optimize, empathy, flexible thinking, accountability, metacognition, contribution, academic discipline, adapt, advancement, research and development, systematic test, refinement, closed-loop system, design process, interdisciplinary, outcome	**Science and Engineering Practices** • **Obtaining, Evaluating, and Communicating Information:** Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or now supported by evidence. • **Analyzing and Interpreting Data:** Analyze and interpret data to determine similarities and differences in findings. • **Developing and Using Models:** Develop a model to describe unobservable. • **Constructing Explanations and Designing Solutions:** Undertake a design project, engaging in the design cycle, to construct

Disciplinary Core Ideas:

- Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.
- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.
- The total number of each type of atom is conserved, and thus the mass does not change.
- Some chemical reactions release energy, others store energy.

and/implement a solution that meets specific design criteria and constraints.

Environmental Literacy & Sustainability Standards

- N/A

Technology & Engineering Standards

- **3.5.6-8.A** Research information from various sources to use and maintain technological products or systems.
- **3.5.6-8.B** Use instruments to gather data on the performance of everyday products.
- **3.5.6-8.F** Analyze examples of technologies that have changed the way people think, interact, live, and communicate.
- **3.5.6-8.G** Analyze how an invention or innovation was influenced by the context and circumstances in which it is developed.
- **3.5.6-8.I** Examine the ways that technology can have both positive and negative effects at the same time.
- **3.5.6-8.K** Use devices to control technological systems.
- **3.5.6-8.N(ETS)** 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.
- **3.5.6-8.O** Interpret the accuracy of information collected.
- **3.5.6-8.P(ETS)** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- **3.5.6-8.Q** Apply a technology and engineering design thinking process.
- **3.5.6-8.R** Develop innovative products and systems that solve problems and extend capabilities based on individual or collective needs and wants.

	• **3.5.6-8.S** Illustrate the benefits and opportunities associated with different approaches to design. • **3.5.6-8.V** Refine design solutions to address criteria and constraints. • **3.5.6-8.X** Defend decisions related to a design problem. • **3.5.6-8.Y** Compare, contrast, and identify overlap between the contributions of science, technology, engineering, and mathematics in the development of technological systems. • **3.5.6-8.AA** Adapt and apply an existing product, system, or process to solve a problem in a different setting. • **3.5.6-8.DD** Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements. • **3.5.6-8.HH** Create a closed-loop system that has no feedback path and requires human intervention. • **3.5.6-8.II** Predict outcomes of a future product or system at the beginning of the design process. • **3.5.6-8.JJ** Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.

Unit 4: Cell Cycle

Standards (Established Goals):

Standard 3.1.6-8.D
• Use arguments 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.
  ○ **Clarifying 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.
  ○ **Assessment Boundary**: N/A
 	
Standard 3.1.6-8.E
• Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms
  ○ **Clarifying 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.
 	
Standard 3.1.6-8.H
• Gather and synthesize information about how sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories
  ○ **Clarifying Statement:** N/A
  ○ **Assessment Boundary:** Assessment does not include mechanisms for the transmission of this information

Enduring Understandings	**Essential Questions**
Big Ideas: • The characteristic structures, functions, and behaviors of organisms change in predictable ways as they progress from birth to old age. • Animals have external and internal sensory receptors that detect different kinds of information that then gets processed by the brain	• How do organisms grow and develop? • How do organisms detect, process, and use information about the environment?

Crosscutting Concepts: • Phenomena may have more than one cause, and some cause-and-effect relationships in systems can only be described using probability. • Cause and Effect relationships may be used to predict phenomena in natural systems	

The students will know	**Enrichment Standards**
Vocabulary: • asexual, sexual, dominance, recessive, frequency, gene, allele, environmental factors, genetic factors, electromagnetic, mechanical, chemical, neurons, synapse, exon, dendrite, receptor sites, stimuli, response • Technology and Engineering: development, research and development, systematic test, refinement, input, resource, output, feedback, evaluate **Disciplinary Core Ideas**: • Animals engage in characteristic behaviors that increase the odds of reproduction. • Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. • Genetic factors as well as local conditions affect the growth of the adult plant.	**Science and Engineering Practices** • Use arguments 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. • Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms **Environmental Literacy & Sustainability Standards** • N/A **Technology & Engineering Standards** • **3.5.6-8.BB** Demonstrate how knowledge gained from other content areas affects the development of technological products and systems. • **3.5.6-8.DD** Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements. • **3.5.6-8.EE** Differentiate between inputs, processes, outputs, and feedback in technological systems. • **3.5.6-8. LL** Compare how different technologies involve different sets of processes.

Grade 8 Science **Hazleton Area School District**

Quarter 3: Life Sciences

Unit 5-Inheritance of Traits

Standards (Established Goals):

Standard 3.1.6-8.M
• 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.
  ○ **Clarifying 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

Enduring Understandings	**Essential Questions**
Big Ideas: • Offspring resemble, but are not identical to, their parents due to traits being passed from one generation to the next via genes. **Crosscutting Concepts:** • 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.	How are the characteristics of one generation related to the previous generation?

The students will know	Enrichment Standards
Vocabulary: • chromosome, allele, dominant, recessive, protein synthesis, offspring, trait, homozygous, heterozygous, mutation, sexual reproduction, inherited, gene • Technology and Engineering: hypothesize, positive outcome, negative outcome, need, want, invention, innovation, perspective, compromise, unsustainable, obsolete, consumption, beneficial, solution, positive impact, negative impact **Disciplinary Core Ideas**: • Genes are located in the chromosomes of cells, with 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. • 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.	**Science and Engineering Practices** • Develop and use a model to describe phenomena. **Environmental Literacy & Sustainability Standards** • **3.4.6-8.A** Develop a model to describe how agricultural and food systems function, including the sustainable use of natural resources and the production, processing, and management of food, fiber, and energy. • **3.4.6-8.D** Gather, read, and synthesize information from multiple sources to investigate how Pennsylvania environmental issues affect Pennsylvania's human and natural systems. • **3.4.6-8.H** Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment. • **3.4.6-8.I** Construct an explanation that describes regional environmental conditions and their implications on environmental justice and social equity. **Technology & Engineering Standards** • **3.5.6-8.C** Hypothesize what alternative outcomes (individual, cultural, and/or environmental) might have resulted had a different technological solution been selected. • **3.5.6-8.G** Analyze how an invention or innovation was influenced by the context and circumstances in which it is developed. • **3.5.6-8.H** Evaluate trade-offs based on various perspectives as part of a decision process that recognizes the need for careful compromises among competing factors. • **3.5.6-8.I** Examine the ways that technology can have both positive and negative effects at the same time.

Unit 6-Variation of Traits

Standards (Established Goals):

Standard 3.1.6-8.N
• 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.
  ○ **Clarifying Statement**: 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.
  ○ **Assessment Boundary**: N/A

Enduring Understandings	**Essential Questions**
Big Ideas: • Variation among individuals of the same species can be explained by both genetic and environmental factors. **Crosscutting Concepts:** • Cause and effect relationships may be used to predict phenomena in natural systems.	• Why do individuals of the same species vary in how they look, function, and behave?

The students will know	**Enrichment Standards**
Vocabulary: • mutation, gene chromosomes, allele, genetic variation, sexual reproduction, trait • Technology and Engineering: criteria, accuracy, precision, judgement, iteration, design thinking process, design process, interdisciplinary, outcome, engineering, creativity, natural-world, human-made, innovation **Disciplinary Core Ideas**: • Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. • Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.	**Science and Engineering Practices** • 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. **Environmental Literacy & Sustainability Standards** • N/A **Technology & Engineering Standards** • **3.5.6-8.O** Interpret the accuracy of information collected. • **3.5.6-8.Q** Apply a technology and engineering design thinking process. • **3.5.6-8.R** Develop innovative products and systems that solve problems and extend capabilities based on individual or collective

• 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.	needs and wants. • **3.5.6-8.S.** Illustrate the benefits and opportunities associated with different approaches to design. • **3.5.6-8.II** Predict outcomes of a future product or system at the beginning of the design process. • **3.5.6-8.KK** Explain how technology and engineering are closely linked to creativity, which can result in both intended and unintended innovations.

Quarter 4: Life Sciences

Unit 7-Evidence of Common Ancestry and Diversity

Standards (Established Goals):
Standard 3.1.6-8.O • 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. o **Clarifying 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. o **Assessment Boundary**: Assessment does not include the names of individual species or geological eras in the fossil record. **Standard 3.1.6-8.P** • Apply scientific ideas to construct an explanation for anatomical similarities and difference among modern organisms and between modern and fossil organizations to infer evolutionary relationships. o **Clarifying Statement**: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures. o **Assessment Boundary**: N/A. **Standard 3.1.6-8.Q** • Analyze displays of pictorial data to compare patterns of similarities in anatomical structures across multiple species to identify relationships not evident in the full formed anatomy. o **Clarifying Statement**: Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures o **Assessment Boundary**: Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.

Enduring Understandings	**Essential Questions**
Big Ideas: • Comparisons between species provides evidence that species evolved from common ancestors which explains the similarities and differences between species. **Crosscutting Concepts:** • Graphs, charts, and images can be used to identify patterns in data.	• What evidence supports that different species are related?

• Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. • Patterns can be used to identify cause and effect relationships. • Graphs, charts, and images can be used to identify patterns in data	

The students will know	**Enrichment Standards**
Vocabulary: • fossil, radioactive, extinct, sedimentary, metamorphic, erosion, fossil, evolutionary relationships, anatomical, infer, embryo, anatomy, embryological development **Disciplinary Core Ideas**: • 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. • 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. • Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully formed anatomy.	**Science and Engineering Practices** • 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. • 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. • Analyze displays of pictorial data to compare patterns of similarities in anatomical structures across multiple species to identify relationships not evident in the fully formed anatomy. **Environmental Literacy & Sustainability Standards** • N/A **Technology & Engineering Standards** • **3.5.6-8.O** Interpret the accuracy of information collected. • **3.5.6-8.T** Create solutions to problems by identifying and applying human factors in design. • **3.5.6-8.V** Refine design solutions to address criteria and constraints. • **3.5.6-8.X** Defend decisions related to a design problem.

Unit 8-Natural Selection

Standards (Established Goals):

Standard 3.1.6-8.R
• Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms
  ○ **Clarifying 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.
  ○ **Assessment Boundary**: N/A.
 	
Standard 3.1.6-8.S
• 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.
  ○ **Clarifying Statement**: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.
  ○ **Assessment Boundary**: N/A.

Enduring Understandings	**Essential Questions**
Big Ideas: • In any environment individuals with particular traits may be more likely than others to survive and produce offspring. **Crosscutting Concepts:** • Phenomena may have more than one cause, and some cause-and-effect relationships in systems can only be described using probability. • 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. • Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.	• How does genetic variation among organisms affect survival and reproduction?

The students will know	Enrichment Standards
Vocabulary: • genetic engineering, advantageous trait, disadvantageous trait, genetic variations, sexual reproduction, natural selection, systems, probability • Technology and Engineering: criteria, accuracy, precision, judgement, human factors, constraint, optimize, empathy, flexible thinking, accountability, metacognition **Disciplinary Core Ideas**: • In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring. • Natural selection leads to the predominance of certain traits in a population, and the suppression of others.	**Science and Engineering Practices** • Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. • 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. **Environmental Literacy & Sustainability Standards** • N/A **Technology & Engineering Standards** • **3.5.6-8.BB** Demonstrate how knowledge gained from other content areas affects the development of technological products and systems. • **3.5.6-8.DD** Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements. • **3.5.6-8.EE** Differentiate between inputs, processes, outputs, and feedback in technological systems.