East Stroudsburg Area School District
8th grade Life Science

Unit 1: Nature of Science - to be taught throughout the 6th, 7th and 8th grade years

Course Time: 6 weeks

Overview: Students are taught key principles and ideas which provide a description of science as a way of knowing, as well as characteristics of scientific knowledge.

Unit Essential Questions:

How does science differ from other ways of interpreting the world?
How does a question/problem lead to an experiment?
What constitutes evidence and when do you know you have enough and the right kind of evidence?

PSSA Content Module/Assessment Anchor:

3.1.6.A9 3.1.7.A9 3.1.8.A9 3.4.6.D1

PSSA Eligible Content:

S8.A.1.1.1 S8.A.1.1.2 S8.A.1.1.3 S8.A.1.1.4 S8.A.1.2.1 S8.A.1.2.2 S8.A.1.2.3 S8.A.2.1.1 S8.A.2.1.2 S8.A.2.1.3 S8.A.2.1.4 S8.A.2.2.1 S8.A.2.2.2 S8.A.3.1.1 S8.A.3.2.1

Extended Standards:

PA Core Language Arts standards: See PA Core ELA Standards: Appendix A
PA Core Math standards: See PA Core Math Standards: Appendix B
ISTE Standards: See ISTE Standards: Appendix C
Career Education and Work Standards: See Career Education and Work Standards: Appendix D

Enrichment: Developed per individual and will vary

Remediation: Developed per individual and will vary

IEP/GIEP: Refer to individual student's education plan under specially designed instruction.

Unit 1: Nature of Science					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Nature of Science **3.1.6.A9** **3.1.7.A9** **3.1.8.A9** **3.4.6.D1**	Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (visuals, scenarios, graphs). Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems. Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems. Apply appropriate instruments for specific purposes and describe the information the instruments can provide.	Explain how certain questions can be answered through scientific inquiry and/or technological design Use evidence to support inferences and claims about an investigation or relationship Use evidence, observations, or explanations to make inferences about changes in systems over time. Identify variables that cause changes in natural or human-made systems. Use evidence, observations, or a variety of scales to describe relationships.	independent variable inference conclusion observational research opinion-based research dependent variable observation controlled experiment data analysis interpreting data control controlled group predict procedure classifying scientific inquiry hypothesis qualitative observation quantitative observation variable ethics bias scientific theory scientific labs hologram	Online textbooks Supplementary material Teacher developed notes/Powerpoints DVD support/Bill Nye/NOVA/Discover Connect Ed Brain Pop videos WebquestsLab: Skills Practice Science Skill Handbook Foldables	Varied formative, summative, diagnostic and or benchmark assessments projects-individual/group computer generated research, webquests Web based activities Lab reports Oral lab reports

Unit 1: Nature of Science					
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Nature of Science **3.1.6.A9** **3.1.7.A9** **3.1.8.A9** **3.4.6.D1**	Explain the parts of a simple system, their roles, and their relationships to the system as a whole. Apply knowledge of models to make predictions, draw inferences, or explain technological concepts Apply a design process to solve problems beyond the laboratory classroom.	Describe the positive and negative, intended and unintended, effects of specific scientific results or technological developments (e.g., air/space travel, genetic engineering, nuclear fission/fusion, artificial intelligence, lasers, organ transplants). Describe fundamental scientific or technological concepts that could solve practical problems (e.g., Newton's laws of motion, Mendelian genetics). Examine systems changing over time, identifying the possible variables causing this change, and drawing inferences about how these variables affect this change.	See Previous Page	See Previous Page	See Previous Page

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Nature of Science **3.1.6.A9** **3.1.7.A9** **3.1.8.A9** **3.4.6.D1**	See Previous Page	Use evidence, observations, or explanations to make inferences about change in systems over time (e.g., carrying capacity, succession, population dynamics, loss of mass in chemical reactions, indicator fossils in geologic time scale) and the variables affecting these changes Use evidence, observations, or a variety of scales (e.g., mass, distance, volume, temperature) to describe relationships. Use space/time relationships, define concepts operationally, raise testable questions, or formulate hypotheses.	See Previous Page	See Previous Page	See Previous Page

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Nature of Science **3.1.6.A9** **3.1.7.A9** **3.1.8.A9** **3.4.6.D1**	See Previous Page	Design a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which variables will be held constant. Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions Describe ways technology (e.g., microscope, telescope, micrometer, hydraulics, barometer) extends and enhances human abilities for specific purposes.	See Previous Page	See Previous Page	See Previous Page

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PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Nature of Science **3.1.6.A9** **3.1.7.A9** **3.1.8.A9** **3.4.6.D1**	See Previous Page	Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions Describe repeated processes or recurring elements in natural, scientific, and technological patterns Identify and describe patterns as repeated processes or recurring elements in human-made systems (e.g., trusses, hub-and-spoke system in communications and transportation systems, feedback controls in regulated systems).	See Previous Page	See Previous Page	See Previous Page

Unit 2: Cells and Heredity

Course Time: 5-6 weeks

Overview: In this unit, students will identify the structure and function of the cell. Students will describe cellular processes (i.e. photosynthesis, respiration, cell cycle, replication, meiosis, and protein synthesis). Students will describe how DNA determines traits and characteristics throughout generations.

Unit Essential Questions:

What are living things and how are they classified?
How do the structures and processes of a cell enable it to survive?
How can one cell become a multicellular organism?
Why do living things reproduce?
How are traits passed from parents to offspring?
How do species adapt to changing environments over time?

Keystone Content Module/Assessment Anchor: BIO.A.2.2 BIO.A.3.1 BIO.A.3.2 BIO.A.4.1 BIO.B.1.1 BIO.B.1.2

Keystone Eligible Content:

BIO.A.2.2.1	BIO.A.2.2.3	BIO.A.3.1.1	BIO.A.3.2.1	BIO.A.4.1.1
BIO.A.4.1.2	BIO.B.1.1.1	BIO.B.1.2.1	BIO.B.1.2.2	

Pennsylvania Content Module/Assessment Anchor: S8.B.1 S8.A.3 S8.A.2 S.8.B.2 S8.C.1

Pennsylvania Eligible Content:

S8.B.1.1.1	S8.B.1.1.4	S8.A.3.1	S8.A.2.2	S8.A.2.1	S8.C.1.1	S8.C.1.2	S8.B.2.2

Extended Standards:

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Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Cell Structure **S.8.B.1** **S.8.A.3.1**	Describe and compare structural and functional similarities and differences that characterize diverse living things Explain the parts of a simple system, their roles, and their relationships to the system as a whole.	Describe levels of biological organization from cell to organism ● Organize an organism from cell to body system Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways ● Correlate cell organelles with the jobs they perform and analyze how they function. Explain how characteristic similarities and differences ● Compare and contrast the similarities and differences between a plant cell and animal cell Explain the concept of order in a system(trophic levels; simple to complex-levels of biological organization from cell to organism) ● Analyze how the organelles work together to make the cell function	Cell Organelle Cell wall Cell membrane Nucleus Nuclear pore Cytoplasm Mitochondria Endoplasmic Reticulum Smooth ER Rough ER Ribosome Golgi Body Chloroplast Vacuole Central vacuole Lysosome Nucleolus Nuclear Envelope Chromatin Chromosome Centrioles Protein Genetic material Tissue Organ Organ system Cytoskeleton	Cells and Heredity Text book The Cell Movie Bill Nye: Cells Cells of the body video Study Island Mr. Parr YouTube Songs United Streaming Videos Planet Earth Cellsalive.com Life Frozen Planet United Streaming Videos ESASD video library videos	Cell City Travel Brochure Cell Organelle Quiz Supplemental Book Activities Microscope: viewing various animal cells.

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Microscope Lab tools **S.8.A.2.2** **S.8.A.2.1**	Select and safely use appropriate tools and describe the information provided by each tool. Apply knowledge of scientific investigation or technological design in different contexts to make inferences, solve problems, and/or answer questions	Describe the safe and appropriate use of instruments and scales to accurately and safely make measurements under a variety of conditions. ● Investigate slides using the microscope to identify different structures Apply measurement systems to record and interpret observations under a variety of conditions. ● Using a microscope differentiate between different types of cells Describe ways technology is used to enhance scientific study and/or human life. ● Explain how microscopes have advanced knowledge in cell biology Use evidence from investigations to clearly describe relationships and communicate and support conclusions. Describe the scientific process that Hooke and Leeuwenhoek underwent to discover cells	Microscopes High power objective Low power objective Oil Immersion lens Stage Stage Clips Eyepiece Base Body Tube Coarse Focus Fine Focus Arm Medium power objective Inclination joint diaphragm revolving nosepiece magnification electron microscope compound microscope resolution ocular lens	Cells and Heredity Textbook Parts of Microscope worksheet Microscope slides Protist cultures Bill Nye videos Planet Earth Life Frozen Planet Mr. Parr Youtube songs ESASD video library videos Microscope	Microscope Lab Pond life Lab Parts of a Microscope quiz Microscope theory quiz Tests Supplemental book activities

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Chemical compounds **S.8.C.1.1** **S.8.C.1.2**	Describe the structure of matter and its chemical and physical properties. Compare chemical and physical changes of matter	Recognize that the atom is the basic building block for all matter. ● Distinguish between elements and compounds found in organic life. Explain the differences between elements, compounds, and mixtures ● Compare and contrast elements and compounds. Identify the reactants and products of simple chemical reactions. ● Recognize how elements do not retain their properties when they form into compounds. Compare the behavior of particle motion in solids, liquids, and gasses.	Element Compound Carbohydrate Glucose Monosaccharide Disaccharide Polysaccharide Cellulose Glycogen Lipid Fatty acids Glycerol Protein Amino Acid Enzyme Nucleic Acid DNA RNA Organic Inorganic Structure Function Enzyme	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos Samples of lipids, carbohydrates, proteins, and nucleic acids	Tests Quizzes CSI lab Supplemental book activities

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Cell processes **S.8.A.3** **S.8.B.1.** **S.8.C.1**	Describe repeated processes or recurring elements in natural, scientific, and technological patterns Describe and compare structural and functional similarities and differences that characterize diverse living things Describe the structure of matter and its chemical and physical properties	Describe patterns as repeated processes or recurring elements in natural and human-made systems Describe how specific structures in living things(from cell to organisms) help them function effectively in specific ways(e.g. chlorophyll in plant cells-photosynthesis; roothairs-increase surface area) ● Identify the differences between passive and active transport and how they occur in the cell. Identify the reactants and products of simple chemical reactions.(e.g. photosynthesis, cellular respiration) ● Organize the raw products and reacts used in respiration and photosynthesis	Selectively Permeable Concentration Diffusion Osmosis Hypertonic Hypotonic Isotonic Passive Transport Active Transport Protein pumps Transport protein Engulfing Exocytosis Endocytosis Cell Membrane Amoeba Chloroplast Chlorophyll Pigment Mitochondria ATP Reactants Products Photosynthesis Cellular Respiration	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos ESASD video library videos Osmosis Jones Mr. Parr Youtube songs	Tests Quizzes Supplemental book activities Gummy bear lab

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Cell processes **S.8.A.3** **S.8.B.1.** **S.8.C.1**	Describe how energy flows through the living world	Describe how energy is obtained and used by organisms throughout their lives ● Analyze how respiration and photosynthesis creates a circle of life on the planet.	Chloroplast Chlorophyll Pigment Mitochondria ATP Reactants Products Photosynthesis Cellular Respiration	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos Leaves Microscope	Tests Quizzes Supplemental book activities

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Cell division **S.8.A.1** **S.8.A.2** **S.8.A.3**	Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats(visuals, scenarios, graphs) Select and safely use appropriate tools and describe the information provided by each tool. Describe repeated processes or recurring elements in natural, scientific, and technological patterns	Use evidence to develop descriptions, explanations, and models ● Construct a model representing the phases of the cell cycle. Describe ways technology is used to enhance scientific study and/or human life. ● Explain how scientific research has contributed to cancer treatments Describe patterns as repeated processes or recurring elements in natural and human-made systems ● Explain the process of cell division from interphase until cytokinesis	Cell Cycle Interphase Replication Mitosis Prophase Metaphase Anaphase Telophase Chromosome Cytokinesis Cell Plate Chromosome Chromatid Chromatin Centromere DNA Nucleus Daughter cell Nuclear Membrane Nitrogen bases Cancer Benign Malignant Mutation Tumor Chemotherapy Treatment Prevention Radiation	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos Microscope Microscope slides	Tests Quizzes Supplemental book activities Projects

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Cell Division S.8.B.1	Describe and compare structural and functional similarities and differences that characterize diverse living things Compare methods of reproduction.	Describe how specific structures in living things help them function effectively in specific ways ● Describe how the centrioles aid in cell division ● Differentiate between chromosomes, chromatin, and chromatids Explain how cells arise from the division of a pre-existing cell. ● Describe how cells are created for growth and repair Compare various basic sexual and asexual reproductive processes ● Explain why mitotic cell division creates genetically identical cells Explain why the life cycles of different organisms have varied lengths. Differentiate between the lengths of time interphase, mitosis, and cytokinesis take	See previous list	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos	Tests Quizzes Supplemental book activities Projects

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Genetics **S.8.A.2** **S.8.A.3**	Apply knowledge of scientific investigation or technological design in different contexts to make inferences, solve problems, and/or answer questions. Apply knowledge of models to make predictions, draw inferences, or explain technological concepts Describe repeated processes or recurring elements in natural, scientific, and technological patterns Explain natural selection and its role in evolutions	Use evidence from investigations to clearly describe relationships and communicate and support conclusions. Make inferences based on scientific models(e.g., charts, graphs, diagrams). Describe patterns as repeated processes or recurring elements in natural and human-made systems Explain how inherited traits(genes) and/or behaviors help organisms survive and reproduce in different environments.	Heredity Trait Genetics Fertilization Purebred Gene Alleles Dominant Allele Recessive Allele Hybrid Crossing Offspring Probability Punnett Squares Phenotype Genotype Homozygous Heterozygous Co-dominance Inheritance	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos Sponge Bob Punnett Square worksheets	Tests Quizzes Supplemental book activities Genetic dragon Project

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Genetics **S.8.B.2**	Explain how a set of genetic instructions determines inherited traits of organisms.	Identify and explain differences between inherited and acquired traits. Recognize evidence that the gene is the basic unit of inheritance and explain the effect of dominant and recessive genes on inherited traits Explain how mutations can alter a gene and are source of new variations in a population. Describe how selective breeding or biotechnologies can change the genetic makeup of an organism	RNA mRNA tRNA Protein Protein synthesis Mutation Substitution Deletion Addition	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos	Tests Quizzes Supplemental book activities

Unit 2: Cells and Heredity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Evolution **S.8.A.1** **S.8.B.1** **S.8.B.2**	Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats Describe and compare structural and functional similarities and differences that characterize diverse living things. Explain natural selection and its role in evolution	Distinguish between a scientific theory and a general opinion, explaining how a theory is supported with evidence. Describe levels of biological organization from cell to organism Explain how characteristic similarities and differences are used to identify and/or categorize organisms Explain how inherited traits(genes) and/or behaviors help organisms survive and reproduce in different environments. Explain that adaptations within species(physical, behavioral, physiological) are developed over long periods of time	Fossil record Mold Cast Trace fossil Geological time table Extinction Biological evolution	Cells and Heredity Textbook Planet Earth Frozen Planet Life Bill Nye Videos United Streaming videos Mr. Parr Youtube songs ESASD video library videos	Tests Quizzes Supplemental book activities

Unit 3: Bacteria to Plants

Course Time: 12 weeks

Overview: In this unit, students will identify and describe the characteristics of living things and how living things are classified. Students will differentiate between viruses, bacteria, protists, fungi, and plants. Students will describe the unique structures and functions of the various types of bacteria, protists, fungi, and plants.

Unit Essential Questions:

What are bacteria and viruses, and why are they important?
What are protists and fungi? How do they affect an environment?
Why are plants in so many environments on Earth?
What processes enable plants to survive and reproduce?

Keystone Content Module/Assessment Anchor: BIO.A.1.1 BIO.A.3.2 BIO.A.3.2 BIO.A.3.2

Keystone Eligible Content: BIO.A.1.1.1 BIO.A.3.2.1 BIO.A.3.2.2 BIO.A.3.2.1

Pennsylvania Content Module/Assessment Anchor: S8.A.1 S8.A.2 S8.B.1 S8.B.3

Pennsylvania Eligible Content: S8.A.1.1 S8.A.2.1 S8.B.1.1 S8.B.1.2 S8.B.1.3 S8.B.3.1 S8.B.3.2

Extended Standards:

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Remediation: Developed per individual and will vary

IEP/GIEP: Refer to individual student's education plan under specially designed instruction.

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Living Things S.8.B.1.1	Describe and compare structural and functional similarities and differences that characterize diverse living things	Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Compare and contrast the various basic life functions or an organism - Describe the difference between unicellular and multicellular organisms and give examples of each - Identify the basic chemicals of life -Explain why living things need energy -Give examples of stimulus and response -Describe the difference between growth and development -Describe the difference between asexual and sexual reproduction Students will explain and describe the four needs of all organisms (food, water, living space, homeostasis)	Organism Cell Autotroph Heterotroph Unicellular Multicellular Stimulus Response Development Controlled experiment Manipulated variable Hypothesis Homeostasis Growth Asexual reproduction Sexual reproduction Spontaneous generation Carbohydrates Proteins Lipids Nucleic acids DNA RNA Cellular respiration	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming video	Supplemental book activities (worksheets/diagrams) Test/quiz on living things Outdoor lab differentiating living vs. non-living things Interpretive trail Section assessment Student discussion Chapter review questions

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Living Things **S.8.B.1.2** **S.8.A.1.1**	Compare methods of reproduction Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (visuals, scenarios, graphs)	Compare various basic sexual and asexual reproductive processes (e.g. budding, cuttings) Describe the difference between asexual and sexual reproduction Distinguish between a scientific theory and a general opinion, explaining how a theory is supported with evidence Using Redi and Pasteur's experiments explain why spontaneous generation is a mistaken idea Use evidence such as observations or experimental results to support inferences -Explain how Redi and Pasteur set up their experiments to disprove spontaneous generation	See above list	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming video	Supplemental book activities (worksheets/diagrams) Test/quiz on living things Outdoor lab differentiating living vs. non-living things Interpretive trail Section assessment Student discussion Chapter review questions

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Classifying Organisms S.8.B.1.1	Describe and compare structural and functional similarities and differences that characterize diverse living things	Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Arrange organisms in a hierarchy according to similarities and differences in their characteristics -Compare and contrast the levels of organization of different organisms Compare and contrast structures of organisms -Using a dichotomous key identify the identity of an organism Recognize scientific names as a part of binomial nomenclature Explain how evolutionary histories are used to classify organism Explain how using the chemical composition of cells is changing classification of organisms	Classification Taxonomy Binomial nomenclature Genus Species Evolution Levels of classification Taxonomic key/ Dichotomous key Carlos Linneaus Structure Scientific name Field guides Charles Darwin	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island Shark taxonomic key United streaming video	Supplemental book activities (worksheets/diagrams) Test/quiz on Classification Interpretive trail Section assessment Student discussion Chapter review questions Shark taxonomic key Insect dichotomous key project Leaf dichotomous key project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Domains and Kingdoms **S.8.B.1.1**	Describe and compare structural and functional similarities and differences that characterize diverse living things	Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Compare and contrast characteristics of organisms that categorize them into different Domains and Kingdoms Differentiate between unicellular and multicellular organisms and identify examples of each -Discuss the characteristics of the three domains and four Kingdoms (Domain Archaea, Domain Bacteria, Domain Eukarya, Kingdom Protista, Kingdom Fungi, Kingdom Plantae, Kingdom Animalia)	Eukaryote Prokaryote Nucleus Domain Kingdom Bacteria Archea Protists Fungi Plants Animals Unicellular Multicellular Heterotroph Autotroph Decomposer	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming video	Supplemental book activities (worksheets/diagrams) Test/quiz on Domains and Kingdoms Interpretive trail Section assessment Student discussion Chapter review questions

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Viruses **S.8.B.1.1**	Describe and compare structural and functional similarities and differences that characterize diverse living things	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells—photosynthesis; root hairs—increase surface area; beak structures in birds— food gathering; cacti spines—protection from predators). Explain how the structure of the protein coat enables a virus to infect a host cell Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Compare and contrast a virus to a living organism -Discuss characteristics of a virus -Discuss the needs of a virus	Virus Host Parasite Protein Coat Inner Core Protein Active Virus Hidden Virus Genetic Material Bacteriophage Particle Outer membrane Active virus Hidden virus Gene therapy Cystic fibrosis	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island Cdc.gov Mayoclinic.com Library online databases United streaming videos	Supplemental book activities (worksheets/diagrams) Test/quiz on Viruses Section assessment Student discussion Chapter review questions Virus lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Virus **S8.B.1.2**	Compare methods of reproduction	Compare various basic sexual and asexual reproductive processes (e.g. budding, cuttings) -Compare and contrast an active virus and hidden virus -Explain how an active virus and hidden virus causes and infection in a cell. (active and hidden virus cycles)	See above list	See above list	Supplemental book activities (worksheets/diagrams) Test/quiz on Viruses Section assessment Student discussion Chapter review questions Virus lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Bacteria **S8.B.1.1**	Describe and compare structural and functional similarities and differences that characterize diverse living things	Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Compare and contrast characteristics and activates of bacteria -Explain the common structure of bacteria. (Cell wall, cell membrane, ribosome, cytoplasm, and genetic material) - Describe the shapes and size of bacteria -Explain the different roles of bacteria in nature	Bacteria Flagellum Ribosome Endospore Respiration Asexual reproduction Sexual reproduction Binary fission Conjugation Decomposer Pasteurization Infectious Disease Antibiotic Scientific name Cellular respiration Autotroph Heterotroph Nitrogen-fixation Genetic engineering	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island Cdc.gov Mayoclinic.com Library online data bases United streaming videos Bacteria Video	Supplemental book activities (worksheets/diagrams) Test/quiz on bacteria Section assessment Student discussion Chapter review questions Bacteria growth lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Bacteria **S8.B.1.1**	Describe and compare structural and functional similarities and differences that characterize diverse living things	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells—photosynthesis; root hairs—increase surface area; beak structures in birds— food gathering; cacti spines—protection from predators). Explain the importance of an endospore and how it helps some bacteria to survive in harsh conditions Explain the function of the flagella and how it helps the bacteria in it's environment Describe how the structure of bacteria helps the bacteria function in it's environment	See previous list	See previous lists	Supplemental book activities (worksheets/diagrams) Test/quiz on bacteria Section assessment Student discussion Chapter review questions Bacteria growth lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Bacteria **S8.B.1.2** **S8.C.2.1**	Compare methods of reproduction Describe how energy flows through the living world	Compare various basic sexual and asexual reproductive processes (e.g. budding, cuttings) Differentiate between asexual and sexual reproduction (difference in offspring and parent numbers) Describe how a bacteria undergoes conjugation and binary fission Explain how cells arise from the division of pre-existing cells Explain the process of binary fission Explain the conditions bacteria need to reproduce Describe how energy is obtained and used by organisms throughout their lives Explain how bacteria obtain energy from their environments (Autotrophic bacteria, heterotrophic bacteria, decomposer bacteria)	See previous page	See previous lists	Supplemental book activities (worksheets/diagrams) Test/quiz on bacteria Section assessment Student discussion Chapter review questions Bacteria growth lab Infectious disease research project.

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Bacteria **S8.A.2.1**	Apply knowledge of scientific investigation or technological design in different contexts to make inferences solve problems, and or answer questions	Use evidence from investigations to clearly describe relationships and communicate and support conclusions Students will create experiments to determine best conditions from bacteria growth	See previous list	See previous list	Supplemental book activities (worksheets/diagrams) Test/quiz on bacteria Section assessment Student discussion Chapter review questions Bacteria growth lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Infectious diseases **S.8.B.3.1**	Compare the biotic and abiotic factors of different ecosystems and explain the relationship between these factors	Describe relationships (e.g., predator/prey, competition, symbiosis) between organisms in different ecosystems Explain the effects of a bacterial or viral disease on an organism Describe the characteristics and symptoms of common infectious diseases Describe how infectious diseases can be spread from organism to organism Explain how environmental sources effect the spread diseases	Infectious Disease Antibiotic Toxin Antibiotic resistance Fomites Pathogen Transmission Vector Outbreak Endemic Susceptible Symptom Treatment Antibiotics Vaccine Epidemic Pandemic Occurrence Mortality Antiviral Incidence Prognosis Lymph Nodes Immunity Acute Toxicity Contaminated Antibodies Antigens Biohazard	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island Cdc.gov Mayoclinic.com Library online data bases United streaming videos	Supplemental book activities (worksheets/diagrams) Test/quiz on infectious diseases Section assessment Student discussion Chapter review questions Virus lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Infectious disease S8.B.1.1	Describe and compare structural and functional similarities and differences that characterize diverse living things	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells—photosynthesis; root hairs—increase surface area; beak structures in birds— food gathering; cacti spines—protection from predators). Explain why there are different treatments for bacteria and viral diseases Explain how vaccines are made and how they work	Immunization Chronic Lyme Disease Anthrax Whooping cough African sleeping sickness Tetanus Malaria Tularemia Cholera Shingles Diptheria Tuberculosis Botulism Giardiasis Cold Dengue fever Measles Flue Chicken pox Mumps Polio Rabies Mononucleosis MRSA Small pox West Nile Virus See above list also	See previous list	Supplemental book activities (worksheets/diagrams) Test/quiz on infectious diseases Section assessment Student discussion Chapter review questions Virus lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Protists **S.8.B.1.1**	Describe and compare structural and functional similarities and differences that characterize diverse living things	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells—photosynthesis; root hairs—increase surface area; beak structures in birds— food gathering; cacti spines—protection from predators). Describe the structure and function of ameba, paramecium, and euglena -Explain the importance of the contractile vacuole -Compare and contrast how different animal-like protists move. (Pseudopod, flagella, cilia) -Differentiate between how fungus-like, animal-like, and plant-like protists obtain energy	Protist Contractile vacuole Pseudopod Cilia Cell membrane Parasite Algae Decomposer Nutrients Pigments Symbiosis Mutualism Parasitism Spore Flagella Ameba Paramecium Slime mold Euglena Chloroplasts Red tide Eutrophication Malaria Unicellular Multicellular Heterotroph Autotroph Giardiasis Slime molds Downey Mildews	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island Cdc.gov Mayoclinic.com Library online data bases United streaming videos Protist Video	Supplemental book activities (worksheets/diagrams) Test/quiz on Protists Ameba, paramecium, and euglena reading worksheets Section assessment Student discussion Chapter review questions Protist lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Protists **S.8.B.1.1** **S.8.B.1.2**	Compare methods of reproduction	Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Compare and contrast characteristics between organisms -Compare and contrast animal-like, plant-like, and fungus like protists (Ability to make food, ability to move) Compare various basic sexual and asexual reproductive processes (e.g. budding, cuttings) Describe how different protists undergo binary fission and conjugation Compare and contrast how a bacteria and protist undergoes binary fission	Water Molds Diatoms Dinoflagellates Red Algae Green Algae Brown Algae Sarcodine Ciliates Flagellates Sporozoans Pellicle Macronucleus Micronucleus Vacuole Cytoplasm Anal pore Eye spot Cytoplasm	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming videos	Supplemental book activities (worksheets/diagrams) Test/quiz on Protists Ameba, paramecium, and euglena reading worksheets Section assessment Student discussion Chapter review questions Protist lab Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Protists **S.8.B.1.2** **S8.B.3.1**	Compare methods of reproduction Compare biotic and abiotic factors of different ecosystems and explain relationships between these factors	Explain how cells arise from the division of pre-existing cells Describe how protists undergo binary fission Describe relationships (e.g., predator/prey, competition, symbiosis) between organisms in different ecosystems Describe the interactions protists have with the organisms in their environment (*Giardia*, Malaria, water molds, downy mildews)	See previous page	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming videos	Supplemental book activities (worksheets/diagrams) Test/quiz on Protists Ameba, paramecium, and euglena reading worksheets Section assessment Student discussion Chapter review questions Protist lab Infectious disease research project.

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Algal blooms S8.B.3.2	Explain ways different variables may cause and/or influence changes in natural or human-made systems	Describe how human interactions with the environment impact an ecosystem Explain the cause and effects of salt water algal blooms and fresh water algal blooms Describe how humans cause eutrophication Determine ways humans can help prevent Eutrophication Explain how changes in environmental conditions can affect the survival of a population and entire species Describe the effects algal blooms have on different organisms	Algal blooms Red tide Eutrophication Nutrients Diatoms Dinoflagellates Green Algae Concentration Toxins Fertilizer Sewage	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming videos	Supplemental book activities (worksheets/diagrams) Test/quiz on Protists Section assessment Student discussion Chapter review questions

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Fungi **S.8.B.1.1** **S8.B.3.2.**	Describe and compare structural and functional similarities and differences that characterize diverse living things Explain ways different variables may cause and/or influence changes in natural or human-made systems	Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells—photosynthesis; root hairs—increase surface area; beak structures in birds— food gathering; cacti spines—protection from predators). Describe how the hyphae allow fungi to feed and reproduce Explain how characteristics similarities and differences (from cells to organism) are used to identify and/or categorize organism Describe what characteristics classify a fungi as a club fungi, sac fungi, and zygote fungi	Fungi Hyphae Fruiting body Budding Lichen Cap Gills Stalk Mold Yeast Asexual reproduction Sexual reproduction Mycorrhiza Parasite Autotrophic Heterotroph Absorption Digestion Spore Genetic material Classification Athlete's foot Ring worm Penicillin Alexander Fleming Dutch elm disease Corn smut Wheat rust	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming videos Cdc.gov	Supplemental book activities (worksheets/diagrams) Test/quiz on fungi Section assessment Student discussion Chapter review questions Infectious disease research project

Unit 3: Bacteria to Plants					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Fungi **S7.B.3.2.** **S.8.B.1.2**	Explain ways different variables may cause and/or influence changes in natural or human-made systems Compare methods of reproduction	Explain how changes in environmental conditions can affect the survival of a population and entire species Explain how pollution affects the populations of lichens Compare various basic sexual and asexual reproductive processes (e.g. budding, cuttings) Explain how fungi reproduce sexually and asexually Explain the process of budding that yeast undergoes Explain how cells arise from the division of pre-existing cells Describe the different ways that fungi can reproduce and produce more fungal cells	Cytoplasm See previous page	Prentice Hall Science explorer: Bacteria to Plants Planet Earth Life Frozen Planet Youtube Mr. Parr videos Bill Nye Video Study Island United streaming videos	Supplemental book activities (worksheets/diagrams) Test/quiz on fungi Section assessment Student discussion Chapter review questions Infectious disease research project.

Unit 4: Animal Diversity

Course Time: 3 weeks

Overview: Students will describe the diversity found in the animal kingdom and its different phylums. The students will also be able to compare and contrast the different animal structures and their functions as they relate to the animals found in each particular phylum. Finally the students will be able to describe how animal behaviors allow individuals to interact and how the organisms reproduce.

Unit Essential Questions:

What are the major groups of animals, and how do they differ?
Why do animals have different structures that perform similar functions?
How do animals communicate, interact, and reproduce?

PSSA Content Module/Assessment Anchor: 3.1.7.C, 3.2.7.B, 3.3.7.A, 3.3.7.B, 4.6.7.A, 4.7.7.B, 3.3.7.D, 4.7.7.A,

PSSA Eligible Content:

S8.A.3.3.1, S8.A.3.3.2, S8.B.1.1.1, S8.B.1.1.2, S8.B.1.1.3, S8.B.1.1.4, S8.B.2.1.1, S8.B.2.1.2, S8.B.2.1.3
S8.B.2.1.4, S8.B.2.1.5

Extended Standards:

PA Core Language Arts standards: See PA Core ELA Standards: Appendix A
PA Core Math standards: See PA Core Math Standards: Appendix B
ISTE Standards: See ISTE Standards: Appendix C
Career Education and Work Standards: See Career Education and Work Standards: Appendix D

Enrichment: Developed per individual and will vary

Remediation: Developed per individual and will vary

IEP/GIEP: Refer to individual student's education plan under specially designed instruction.

Unit 4: Animal Diversity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Animal Diversity **3.1.6.A1** **3.1.7.A** **3.1.7.B** **3.1.8.C1** **3.1.8.A8** **3.3.7.A,** **3.3.7.B,** **4.6.7.A,** **4.7.7.B**	Describe the similarities and differences of major physical characteristics in plants, animals, fungi, protists, and bacteria. Describe the similarities and differences of physical characteristics in diverse organisms. Compare and Contrast observable patterns in the physical characteristics across families, strains and species. Explain why the life cycles of different organisms have varied lengths. Describe how selective breeding and biotechnology can alter genetic composition of organisms. Explain how reproductive success coupled with advantageous traits over many generations contributes to natural selection.	Determine what characteristics all animals have. Explain how are animals classified. Determine what characteristics are shared between invertebrates. Compare and contrast how invertebrate phyla differ. Describe the characteristics of all vertebrates and chordates found under this phylum. Compare and contrast how the classes of vertebrates differ. Describe how the types of support are alike, and how they are different Compare and contrast the types of structures of control.	Vertebrate Invertebrate Radial symmetry Bilateral symmetry Asymmetry Exoskeleton Collar cells Setae Water vascular system Nematocyst Spicules Thorax Abdomen Chelipeds Appendage Notochord Chordate Hydrostatic skeleton Coelom Nerve net Undulation Diffusion Spiracle Gill Open circulatory system Closed circulatory system Crop	Online textbooks Supplementary material Teacher developed notes/Ppts Chromebook- virtual labs DVD support/Bill Nye/NOVA/Discover PBS- NOVA Brain-Pop	Varied formative, summative, diagnostic and or benchmark assessments projects- individual/group computer generated research, webquests Web based activities Lab reports Oral lab reports

Unit 4: Animal Diversity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Animal Diversity **3.1.6.A1** **3.1.7.A** **3.1.7.B** **3.1.8.C1** **3.1.8.A8** **3.3.7.A,** **3.3.7.B,** **4.6.7.A,** **4.7.7.B**	Describe and compare structural and functional similarities and differences that characterize diverse living things.	Compare and contrast the types of movement. Explain how the types of gas exchange differ. Compare and contrast the differences between open and closed circulatory systems. Describe how an animal's structures for feeding and digestion relate to its diet. Describe how the excretory structures of aquatic and terrestrial animals differ. Describe the structures of living things that help them function effectively in specific ways (e.g., adaptations, characteristics).	Gizzard Absorption Behavior Innate behavior Instinct Migration Hibernation Imprinting Conditioning Bioluminescence Pheromone Society Territory Aggression Sexual reproduction Testis Ovary Fertilization Zygote Metamorphosis	See Previous Page	See Previous Page

Unit 4: Animal Diversity					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Animal Diversity **3.1.6.A1** **3.1.7.A** **3.1.7.B** **3.1.8.C1** **3.1.8.A8** **3.3.7.A,** **3.3.7.B,** **4.6.7.A,** **4.7.7.B**	See Previous Page	Compare similarities and differences in internal structures of organisms (e.g.,invertebrate/vertebrate,vascular/nonvascular, single-celled/multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape). Apply knowledge of characteristic structures to identify or categorize organisms (i.e., plants, animals, fungi, bacteria, and protista). Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.	See Previous Page	See Previous Page	See Previous Page

Unit 5: Environmental Science: Life Science

Course Time: 6 weeks

Overview: Environmental Science: A scientific study of the natural world and how it is influenced by people.
Students will focus on the study of the relationships of the natural world and the relationships between organisms and their environments.

Unit Essential Questions:

How do living things and the nonliving parts of the environment interact ?
How do populations and communities interact and change?
How do Earth's biomes and ecosystem differ?

Keystone Content Module/Assessment Anchor: BIO.B.4.1, BIO.B.4.2,

Keystone Eligible Content: BIO.B.4.1.1, BIO.B.4.1.2,BIO.B.4.3, BIO.B.4.2.4, BIO.B.4.2.5

PSSA Content Module/Assessment Anchor: 3.1.7.A, 3.1.7.B, 3.2.7.B

PSSA Eligible Content S.8.A.3.1, S8.A.3.2, S.7.B.3.1, S.7.A.1.3, S.7.A.2.2, S.7.B.3.2, S.7.A.3.1

Extended Standards:
PA Core Language Arts standards: See PA Core ELA Standards: Appendix A
PA Core Math standards: See PA Core Math Standards: Appendix B
ISTE Standards: See ISTE Standards: Appendix C
Career Education and Work Standards: See Career Education and Work Standards: Appendix D

Enrichment: Developed per individual and will vary

Remediation: Developed per individual and will vary

IEP/GIEP: Refer to individual student's education plan under specially designed instruction.

Unit 5: Environmental Science: Life Science					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Living Things and the Environment **S.8.A.3.1** **S.8.B.3.1**	Explain the parts of a simple system, their roles, and their relationships to the system as a whole. Compare the biotic and abiotic factors of different ecosystems and explain relationships between and these factors.	Describe a system (e.g., ecosystem, circulatory system, agricultural system) as a group of related parts with specific roles that work together to achieve an observed result. - Identify the needs that must be met by an organism's surroundings. - Differentiate between ecosystems, communities, populations and organisms Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism). - Classify the various levels or organization in an ecosystem. Describe relationships (e.g., predator/prey competition, symbiosis) between organisms in different ecosystems. - Analyze how biotic and abiotic factors relate in an ecosystem.	Habitat Biotic factor Abiotic factor Photosynthesis Species Population Community Ecosystem Ecology Soil Oxygen	Planet Earth DVD Life DVD Frozen Planet DVD Online Textbook Virtual Labs	Varied formative, summative assessments Projects-individual/group Classroom discussion Teacher-created worksheets

Unit 5: Environmental Science: Life Science					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Integrating Mathematics **S.8.A.1.3** **S.8.A.2.2** **S.8.B.3.2**	Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems. Select and safely use appropriate tools and describe the information provided by each tool.	Describe how variables can cause changes in a system over time. - Observe and identify populations in an ecosystem and how they alter overtime. Use evidence, observations, or explanations to make inferences about changes in systems over time (e.g., carrying capacity, succession, fossil evidence in the geologic time scale). - Differentiate between the needs of populations in relation to the individuals in the population and the community they live in. Apply measurement systems to record and interpret observations under a variety of conditions. - Interpret, analyze and collect data from studies involving members of populations	Estimate Birth rate Death rate Immigration Emigration Population density Limiting factor Carrying capacity Sampling Direct observation Indirect observation Mark and Recapture Population Statement	Online Textbook Virtual Labs Teacher created materials and quizzes	Varied formative, summative assessments Projects-individual/group Classroom discussion Teacher-created worksheets

Unit 5: Environmental Science: Life Science					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Integrating Mathematics **S.8.A.1.3** **S.8.A.2.2** **S.8.B.3.2**	Explain ways different variables may cause and/or influence changes in natural or human-made systems.	Identify and describe factors that cause and/or influence changes in populations (e.g., deforestation, disease, land use, natural disaster, invasive species). - Analyze and describe factors that limit population growth.			Varied formative, summative assessments Projects-individual/group Classroom discussion Teacher-created worksheets

Unit 5: Environmental Science: Life Science					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Relationships Within a Community **S.8.A.3.1** **S.8.B.3.1**	Explain the parts of a simple system, their roles, and their relationships to the system as a whole. Compare the biotic and abiotic factors of different ecosystems and explain relationships between and these factors.	Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism). - Predict how interactions in a community will affect the organisms present. Describe relationships (e.g., predator/prey competition, symbiosis) between organisms in different ecosystems. - Compare and contrast the various forms of symbiosis in a community. -Analyze the effects of predator and prey relationships and how they affect a community.	Natural selection Adaptations Niche Competition Predation Predator Prey Symbiosis Mutualism Commensalism Parasitism Parasite Host Altruisim Mimicry Camouflage False Coloring Protective Covering Warning Coloring Chemical Defense	Online Textbook Virtual Labs Teacher created materials and quizzes	Varied formative, summative assessments Projects-individual/group Classroom discussion Teacher-created worksheets

Unit 5: Environmental Science: Life Science					
PA Core Standards & Eligible Content	**Unit Concepts**	**Unit Competencies**	**Content Vocabulary**	**Materials, Resources, & Instructional Activities**	**Assessments**
Succession **S.8.A.1.3** **S.8.A.3.1**	Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems. Explain the parts of a simple system, their roles, and their relationships to the system as a whole.	Describe how variables can cause changes in a system over time. - Predict what happens to an ecosystem after a catastrophic event. Use evidence, observations, or explanations to make inferences about changes in systems over time (e.g., carrying capacity, succession, fossil evidence in the geologic time scale). -Compare and contrast primary to secondary succession. Describe a system (e.g., ecosystem, circulatory system, agricultural system) as a group of related parts with specific roles that work together to achieve an observed result. - Identify and observe local pioneer species and their involvement in succession in an ecosystem.	Succession Primary succession Pioneer species Secondary succession Ecosystems Lichen Natural Disaster Volcanic Eruption	Life DVD Online Textbook Virtual Labs Teacher created materials and quizzes	Varied formative, summative assessments Projects-individual/group Classroom discussion Teacher-created worksheets