
Sixth Grade Science

Curriculum Guide

Dunmore School District

Dunmore, PA



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Sixth Grade Science

Prerequisite:

- Completion of Fifth Grade

Course Description:

The Sixth Grade Science class is an introductory course on life science. It is designed to give students the basic concepts on living organisms, their functions, similarities and differences. The course begins with life's diversity, the variety of species and grouping into kingdoms. The students then focus on types of cells, their structure and function. Students learn processes of the cells such as diffusion, osmosis, mitosis and meiosis. Student will study DNA structure, passing of traits and inheritance. Sexual reproduction and types of asexual reproduction is studied also. Students will learn about types of plants, photosynthesis, plant fertilization, germination and growth. How the body is organized and the levels of organization is part of the content students learn in the sixth grade science course. The organization of body systems and their functions are covered. In the course students will learn about Earth's biomes and their characteristics. They will learn about adaptation, connections to biospheres and the organizations of biospheres. The human impact and changes in the ecosystem will be studied and discussed. Students use microscopes to look at various specimens including cells throughout the year to examine various specimens studied.

Special Education:

After a student has been evaluated and found to be eligible for specially designed instruction under one of the 13 disability categories, an individualized education plan will be developed to help the student succeed through a more intense intervention program. Special Education is the practice of educating students in a way that addresses their individual differences and needs. The purpose of special education is to provide equal access to education for children ages birth through 21 by providing specialized services that will lead to school success in general education. Our goal for each student is for him/her to be educated in his/her least restrictive environment with additional supports by way of specially designed instruction. After all interventions in the general education setting have been exhausted and the student is still not making progress, students can receive direct instruction in a special education classroom. Direct instruction provides more intense intervention and replacement instruction in order to minimize skill deficits. In our special education classrooms, students will have access to the standards-based general education curriculum, as well as using various research-based intervention programs. Resources and activities will be adjusted based on individual student needs. Suggested time found within the curriculum will be adjusted as needed per individual student's needs.

Special Education Strategies can be located in the IEP Enhancements table located in Appendix: A at the end of this document.

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Year-at-a-glance

Subject: Sixth Grade Science	Grade Level: 6	Date Completed: 4/8/2019
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1st Quarter

Topic	Resources	Standards
Classification of organisms and their biospheres	Approved textbook, <i>Science</i> , Chapter 1: 1-3 worksheets, Making a pamphlet. Bean in a bag activity, vascular plant activity online activities	3.3.7.B, 3.5, 3.6
Cells, structure and function of the cell. Cell parts, processes, division and cell growth.	Approved textbook, <i>Science</i> Chapter 2: 1-3 Interactive web sites, Diagrams, worksheets, text dependent articles	3.1.6.A, 3.4.6.C, 3.4.6.D, 3.5, 3.6
Microscope learning the parts and examining samples	Microscope, slides, interactive sites, Text dependent articles	3.1.7.A, 3.4.6.C, 3.4.6.D, 3.5, 3.6

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2nd Quarter

Topic	Resources	Standards
Asexual reproduction, sexual reproduction, copying DNA, mitosis, meiosis, plant and animal fertilization, selective breeding, sharing traits, determining traits, Punnett squares	Approved textbook, <i>Science</i> Chapter 3: 1-4 Interactive web sites, Diagrams, worksheets, Tech Dependent Analysis	3.1.7.B, 3.2.7.A, 3.3.7.B, 3.3.7.c, 3.3.7.D,

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3rd Quarter

Topic	Resources	Standards
Organization of the body, skeletal system, muscular system, nervous system, endocrine system, digestive system, circulatory system, immune systems.	Approved textbook, <i>Science</i> : Chapter 4: 1-5 online activities and videos, worksheets, diagrams, Text dependent articles	3.1.7.A, 3.1.7.B, 3.3.7.A, 3.3.7.B, 3.5, 3.6
Parts and function of plants parts, photosynthesis, cellular respiration, how plants grow.	Approved textbook, <i>Science</i> : Chapter 5: 1-3 Online activities and videos, worksheets, diagrams, text dependent articles	3.3.7.B, 3.3.7.C, 4.1.7.C, 3.5, 3.6

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4th Quarter

Topic	Resources	Standards
Biomes, Organisms connection to Earth, organization of biospheres, organism's dependence on biosphere, adaptation, Earth biomes.	Approved textbook, <i>Science</i> , Chapter 6: 1-2, interactive sites, projects and worksheets, text dependent articles.	4.4.7.A, 4.4.7.C, 4.5.7.C, 3.8.7.C, 3.5, 3.6
Ecosystems, varying adaptations, food webs, energy flow and pyramids, competing for resources, predators and prey, nitrogen, carbon and water cycles, natural and human changes in ecosystem.	Approved textbook, <i>Science</i> , Chapter 7: 1-4 interactive sites, projects and worksheets, text dependent articles.	4.4.7.A, 4.4.7.C, 4.5.7.C, 3.8.7.C, 3.5, 3.6

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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	<p>Anchor Descriptor: N/A</p> <p>PA Academic Standards: Science 3.3.7.B Describe the cell as the basic structural and functional unit of living things.</p> <ul style="list-style-type: none"> • Identify the levels of organization from cell to organism. • Compare life processes at the organism level with life processes at the cell level. • Explain that cells and organisms have particular structures that underlie their functions. • Describe and distinguish among cell cycles, reproductive cycles and life cycles. • Explain disease effects on structures or functions of an organism. <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text Students read, understand, and</p>	<p>Eligible Content: N/A</p> <p>Essential Knowledge/Skills: All living things have a common set characteristic needs and functions that separate them from nonliving things such as: gas exchange, energy usage, water usage, response, reproduction, elimination of waste, growth, and made of one or more cells.</p> <p>Characteristics of living things. Understand there is variety in living things. Identify the similarities in living things. Classify living things according to their similarities and structures.</p> <p>Vocabulary: Biosphere vertebrates Invertebrates adaptation Species Kingdoms phylum</p>	<p>Approved textbook, <i>Science</i>, Chapter 1: 1-3 worksheets, Making a pamphlet. Bean in a bag activity. Vascular plant activity.</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	20 days

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	<p>respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12</p> <p>3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>	<p>class order family genus species Archaeobacteria Eubacteria Protists Fungi Plants animals vascular nonvascular</p>			
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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
All organisms are made of cells and can be characterized by common aspects of their structure and functioning	<p>Anchor Descriptor: S.6.B.1.1 Explain how the cell is the basic unit of structure and function for all living things.</p> <p>PA Academic Standards 3.1.7.A Explain the parts of a simple system and their relationship to each other.</p> <ul style="list-style-type: none"> • Describe a system as a group of related parts that work together to achieve a desired result (e.g., digestive system). • Explain the importance of order in a system. • Distinguish between system inputs, system processes and system outputs. • Distinguish between open loop and closed loop systems. • Apply systems analysis to solve problems. <p>3.1.7.C Identify patterns as repeated processes or recurring elements in science and technology.</p> <ul style="list-style-type: none"> • Identify different forms of patterns and use them to group and classify specific objects. • Identify repeating structure 	<p>Eligible Content: S.6.B.1.1.1 Describe how cells carry out the many functions needed to sustain life.</p> <p>S.6.B.1.1.2 Identify examples of unicellular and multi-cellular organisms (i.e., plants, fungi, bacteria, protists, and animals).</p> <p>S.6.B.1.1.3 Explain how many organisms are unicellular and must carry out all life functions in one cell.</p> <hr/> <p>Essential Knowledge/Skills: All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).</p> <p>Within cells, special structures are responsible for</p>	<p>Approved textbook, Science Chapter 2: 1-3 Interactive web sites, Diagrams, worksheets, Tech Dependent Analysis</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	20 days

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	<p>patterns</p> <p>3.3.7. A Describe the similarities and differences that characterize diverse living things.</p> <ul style="list-style-type: none"> • Describe how the structures of living things help them function in unique ways. <p>3.3.7. B Describe the cell as the basic structural and functional unit of living things.</p> <ul style="list-style-type: none"> • Identify the levels of organization from cell to organism. • Compare life processes at the organism level with life processes at the cell level. • Explain that cells and organisms have particular structures that underlie their functions. • Describe and distinguish among cell cycles, reproductive cycles and life cycles. • Explain disease effects on structures or functions of an organism. <p>3.3.7. C. Know that every organism has a set of genetic instructions that determines its inherited traits.</p> <ul style="list-style-type: none"> • Identify and explain 	<p>particular functions.</p> <p>Vocabulary: Cell Theory Eukaryote Multicellular Prokaryote Unicellular Organelle Mitochondria Endoplasmic Reticulum Nucleus Vacuole Ribosomes Lysosome Cytoplasm Cell membrane Cell Wall Chloroplast, Chlorophyll Diffusion Osmosis Mitosis Interphase Prophase Metaphase Anaphase Telephase</p>			
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	<p>inheritable characteristics.</p> <ul style="list-style-type: none">• Identify that the gene is the basic unit of inheritance.• Identify basic patterns of inheritance (e.g., dominance, recessive, co-dominance).• Describe how traits are inherited.• Distinguish how different living things reproduce (e.g., vegetative budding, sexual).• recognize that mutations can alter a gene.• Describe how selective breeding, natural selection and genetic technologies can change genetic makeup of organisms. <p>3.1.7.D Explain basic concepts of natural selection.</p> <ul style="list-style-type: none">• Identify adaptations that allow organisms to survive in their environment.• Describe how an environmental change can affect the survival of organisms and entire species.• know that differences in individuals of the same species may give some advantage in surviving and reproducing.• recognize that populations of organisms can increase rapidly.• Describe the role that fossils				
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	<p>play in studying the past.</p> <ul style="list-style-type: none">• Explain how biologic extinction is a natural process. <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12</p> <p>3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12</p> <p>3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>				
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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
<p>All organisms are made of cells and can be characterized by common aspects of their structure and functioning.</p> <p>Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.</p>	<p>Anchor Descriptor:</p> <p>S.6.A.3.1 Explain the parts of a simple system, their roles, and their relationships to the system as a whole.</p> <p>S.6.B.1.1 Explain how the cell is the basic unit of structure and function for all living things.</p> <p>S.7.B.1.2 Compare methods of reproduction.</p> <p>S.7.B.2.1 Explain natural selection and its role in evolution.</p> <p>S.7.B.2.2 Explain how a set of genetic instructions determines inherited traits of organisms.</p> <p>PA Academic Standards: Science</p> <p>3.1.7.A Explain the parts of a simple system and their relationship to each other.</p> <ul style="list-style-type: none"> • Describe a system as a group of related parts that work together to achieve a desired result (e.g., digestive system). • Explain the importance of order in a system. 	<p>Eligible Content:</p> <p>S.6.A.3.1.1 Describe a system as a group of related parts with specific roles that work together to achieve an observed result.</p> <p>S.6.A.3.1.2 Explain how components of natural and human-made systems play different roles in a working system</p> <p>S.7.B.1.2.1 Explain how cells arise from the division of a pre-existing cell.</p> <p>S.7.B.1.2.2 Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).</p> <p>S.7.B.1.2.3 Explain why the life cycles of different organisms have varied lengths.</p> <p>S.7.B.3.2.1 Identify and describe factors that cause and/or influence changes in populations (e.g., deforestation, disease,</p>	<p>Approved textbook, <i>Science</i>, Chapter 3: 1-4</p> <p>Hands on activities, Punnett square Worksheets, text dependent articles.</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	<p>45 days</p>

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	<ul style="list-style-type: none"> • Distinguish between system inputs, system processes and system outputs. • Distinguish between open loop and closed loop systems. • Apply systems analysis to solve problems. <p>3.1.7.B. Describe the use of models as an application of scientific or technological concepts.</p> <ul style="list-style-type: none"> • Identify and describe different types of models and their functions. • Apply models to predict specific results and observations (e.g., population growth, effects of infectious organisms). <p>3.1.7.E Describe the effect of making a change in one part of a system on the system as a whole.</p> <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on</p>	<p>land use, natural disaster, invasive species).</p> <p>S.7.B.3.2.2 Explain how diversity affects the integrity of natural ecological systems.</p> <p>S.7.B.3.2.3 Describe how human interactions with the environment impact an ecosystem (e.g., road construction, pollution, urban development, dam building/removal).</p> <p>S7.B.3.2.4 Explain how changes in environmental conditions can affect the survival of a population and entire species (e.g., climate, hibernation, migration, coloration).</p> <p>S.7.B.1.2 Compare methods of reproduction. S.7.B.3.2 Explain ways different variables may cause and/or influence changes in natural or human-made systems.</p> <p>S.7.C.1.1 Describe the structure of matter and its chemical and physical properties.</p>			
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	<p>textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12</p> <p>3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>	<p>S.6.B.1.1.1 Describe how cells carry out the many functions needed to sustain life.</p> <p>S.6.B.1.1.2 Identify examples of unicellular and multi-cellular organisms (i.e., plants, fungi, bacteria, protists, and animals).</p> <p>S.6.B.1.1.3 Explain how many organisms are unicellular and must carry out all life functions in one cell.</p> <p>S.7.B.1.2.1 Explain how cells arise from the division of a pre-existing cell.</p> <p>S.7.B.1.2.2 Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).</p> <p>S.7.B.1.2.3 Explain why the life cycles of different organisms have varied lengths.</p> <p>S.7.B.2.1.1 Explain how inherited traits (genes) and/or behaviors help organisms survive and reproduce in different environments.</p>			
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S.7.B.2.1.2 Describe how natural selection is an underlying factor in a population's ability to adapt to change.

S.7.B.2.1.3 Explain that adaptations within species (physical, behavioral, physiological) are developed over long periods of time.

S.7.B.2.2 Explain how a set of genetic instructions determines inherited traits of organisms.

Reference: 3.1.7.B, 3.1.7.C

S.7.B.2.2.1 Identify and explain differences.

S.7.B.2.2.1 Identify and explain differences between inherited and acquired traits.

S.7.B.2.2.2 Recognize evidence that the gene is the basic unit of inheritance and explain the effect of dominant and recessive genes on inherited traits.

S.7.B.2.2.3 Explain how mutations can alter a gene and

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are a source of new variations in a population.

S.7.B.2.2.4 Describe how selective breeding or biotechnologies can change the genetic makeup of an organism (e.g., domesticated dogs, horses, cows; crops, hybrid plants; integrated pest management).

Essential Knowledge/Skills:
Living organisms reproduce in a variety of ways that may involve sexual or asexual reproduction. Reproduction usually follows a cycle.

Genetic factors as well as local conditions affect the growth of organisms

Organisms have characteristic behaviors and structures that increase their odds of reproduction.

In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and

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hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.

Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.

Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual.

Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.

Vocabulary:
Asexual reproduction

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		Cell division Life cycles Egg Sperm Meiosis Fertilization Selective breeding Sexual reproduction DNA Environmental factors Genetic factors Scientific explanation Dominant Traits Recessive Traits Punnett Square			
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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	<p>Anchor Descriptor: S8.B.2.1 Explain the basic concepts of natural selection.</p> <p>PA Academic Standards: Science 3.1.7.A Explain the parts of a simple system and their relationship to each other.</p> <ul style="list-style-type: none"> • Describe a system as a group of related parts that work together to achieve a desired result (e.g., digestive system). <p>3.1.7.B Describe the use of models as an application of scientific or technological concepts.</p> <ul style="list-style-type: none"> • Identify and describe different types of models and their functions. • Explain systems by outlining a system’s relevant parts and its purpose and/or designing a model that illustrates its function. <p>3.3.7A Describe the similarities and differences that characterize diverse living things.</p>	<p>Eligible Content: S8.B.2.1.1 Explain how inherited structures or behaviors help organisms survive and reproduce in different environments.</p> <p>S8.B.2.1.2 Explain how different adaptations in individuals of the same species may affect survivability or reproduction success.</p> <p>S8.B.2.1.3 Explain that mutations can alter a gene and are the original source of new variations.</p> <p>S8.B.2.1.4 Describe how selective breeding or biotechnology can change the genetic makeup of organisms.</p> <p>S8.B.2.1.5 Explain that adaptations are developed over long periods of time and are passed from one generation to another.</p> <p>S8.B.2.2.2 Recognize that the</p>	<p>Approved textbook, <i>Science: Chapter 4: 1-5</i> online activities and videos, worksheets, diagrams, Text Dependent analysis.</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	35 days

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	<ul style="list-style-type: none"> • Describe how the structures of living things help them function in unique ways. • Explain how to use a dichotomous key to identify plants and animals. • Account for adaptations among organisms that live in a particular environment. <p>3.3.7B Describe the cell as the basic structural and functional unit of living things.</p> <ul style="list-style-type: none"> • Identify the levels of organization from cell to organism. • Compare life processes at the organism level with life processes at the cell level. • Explain that cells and organisms have particular structures that underlie their functions. • Describe and distinguish among cell cycles, reproductive cycles and life cycles. • Explain disease effects on structures or functions of an organism. <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text</p>	<p>gene is the basic unit of inheritance, that there are dominant and recessive genes, and that traits are inherited.</p> <hr/> <p>Essential Knowledge/Skills: In multicellular organisms, there is a systems framework of organization from cells to tissues, to organs to organ systems. These systems are specialized for particular body functions of an organism. Organisms have sense receptor that responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to a brain or processing center. These signals are processed and result in immediate behaviors or memories.</p> <p>Vocabulary: Cells Molecules Organ systems Organelles Organs Tissues Neurons Biofeedback loop</p>			
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	<p>Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>	<p>Body systems Circulatory Digestive Endocrine Excretory Immune Muscular Nervous Reproductive Respiratory Skeletal</p>			
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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	<p>Anchor Descriptor: S8.B.1.1 Describe and compare structural and functional similarities and differences that characterize diverse living things.</p> <p>S8.B.2.1 Explain the basic concepts of natural selection.</p> <p>PA Academic Standards: Science 3.3.7B Describe the cell as the basic structural and functional unit of living things.</p> <ul style="list-style-type: none"> • Identify the levels of organization from cell to organism. • Compare life processes at the organism level with life processes at the cell level. • Explain that cells and organisms have particular structures that underlie their functions. • Describe and distinguish among cell cycles, reproductive cycles and life cycles. • Explain disease effects on structures or functions of an organism. <p>3.3.7.C Know that every organism</p>	<p>Eligible Content: S8.B.1.1.3 Apply knowledge of characteristic structures to identify or categorize organisms (i.e., plants, animals, fungi, bacteria, and protist).</p> <p>S8.B.2.1.1 Explain how inherited structures or behaviors help organisms survive and reproduce in different environments.</p> <p>S8.B.2.1.2 Explain how different adaptations in individuals of the same species may affect survivability or reproduction success.</p> <p>S8.B.2.1.3 Explain that mutations can alter a gene and are the original source of new variations. S8.B.2.1.4 Describe how selective breeding or biotechnology can change the genetic makeup of organisms.</p> <p>S8.B.2.1.5 Explain that adaptations are developed over long periods of time and are passed from one</p>	<p>Approved textbook Science, Chapter 5: 1-3 Diagrams, worksheets, online interactive sites</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	10 days

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	<p>has a set of genetic instructions that determines its inherited traits.</p> <ul style="list-style-type: none"> • Identify and explain inheritable characteristics. • Identify that the gene is the basic unit of inheritance. • Identify basic patterns of inheritance (e.g., dominance, recessive, co-dominance). • Describe how traits are inherited. • Distinguish how different living things reproduce (e.g., vegetative budding, sexual). • recognize that mutations can alter a gene. • Describe how selective breeding, natural selection and genetic technologies can change genetic makeup of organisms. <p>4.1.7.C Explain the flow of energy within an ecosystem.</p> <ul style="list-style-type: none"> • Compare and contrast the flow of energy between organisms in different habitats. • Explain the concept of trophic levels. <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text</p>	<p>generation to another.</p> <p>Essential Knowledge/Skills: Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.</p> <p>Some organisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen.</p> <p>Vocabulary: Epidermis Xylem Phloem Stoma Guard cells Transpiration Photosynthesis Cellular Respiration Angiosperm Gymnosperms Germination and Growth Tropism Aerobic respiration Anaerobic respiration</p>			
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	<p>Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12</p> <p>3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>				
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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	<p>Anchor Descriptor:</p> <p>S8.B.3.1 Explain the relationships among and between organisms in different ecosystems and their abiotic and biotic components.</p> <p>S8.B.3.3 Explain how renewable and nonrenewable resources provide for human needs or how these needs impact the environment.</p> <p>PA Academic Standards: Science</p> <p>4.4.7. A Explain society’s standard of living in relation to agriculture.</p> <ul style="list-style-type: none"> • Compare and contrast agricultural changes that have been made to meet society’s needs. • Compare and contrast how animals and plants affect agricultural systems. • Compare several technological advancements and their effect(s) on the historical growth of agriculture. • Compare different environmental conditions related to agricultural production, cost and quality of the product. 	<p>Eligible Content:</p> <p>S8.B.3.1.1 Explain the flow of energy through an ecosystem (e.g., food chains, food webs).</p> <p>S8.B.3.1.3 Explain relationships among organisms (e.g., producers/consumers, predator/prey) in an ecosystem.</p> <p>S8.B.3.3.2 Explain how renewable and nonrenewable resources provide for human needs (i.e., energy, food, water, clothing, and shelter).</p> <hr/> <p>Essential Knowledge/Skills:</p> <p>Organisms and populations of organisms are dependent on their environmental interactions, both biotic and abiotic factors.</p> <p>In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access</p>	<p>Approved textbook, <i>Science</i>, Chapter 6: 1-2, Chapter 7: 1-4, interactive sites, projects and worksheets, text dependent articles.</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	40 days

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	<p>4.4.7. C Explain agricultural systems’ use of natural and human resources.</p> <ul style="list-style-type: none"> • Analyze the needs of plants and animals as they relate to climate and soil conditions. • Identify the plants and animals that can be raised in the area and explain why. • Identify natural resources necessary for agricultural systems. • Compare the need for crop production to the need for animal production. • Define issues associated with food and fiber production. <p>4.5.7. C Explain various integrated pest management practices used in society.</p> <ul style="list-style-type: none"> • Compare and contrast integrated pest management monitoring methods utilized in different community settings. • Compare integrated pest management to past practices. • Compare and analyze the long-term effects of using integrated pest management products. <p>3.8.7. C Identify the pros and cons</p>	<p>to which consequently constrains their growth and reproduction.</p> <p>Growth of organisms and population increases are limited by access to resources.</p> <p>Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling of matter</p> <p>Design or evaluate solutions for maintaining biodiversity and / or ecosystems services.</p> <p>Vocabulary: Abiotic Biotic Consumer Ecosystem Energy pyramid Food chain Food web Niche Predator Prey Producer Symbiosis Population</p>			
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	<p>of applying technological and scientific solutions to address problems and the effect upon society.</p> <ul style="list-style-type: none"> • Describe the positive and negative expected and unexpected effects of specific technological developments. • Describe ways technology extends and enhances human abilities. <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>	<p>Community Carbon cycle Decomposition Nitrogen cycle Carbon Cycle Water Cycle</p>			
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General Topic	Anchor Descriptor	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
	PA Academic and Core Standards				
<p>Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.</p> <p>Use appropriate instruments and apparatus to study materials</p>	<p>Anchor Descriptor: S.7.A.2.2 Select and safely use appropriate tools and describe the information provided by each tool.</p> <p>PA Academic Standards: Science 3.1.7.A Explain various integrated pest management practices used in society.</p> <ul style="list-style-type: none"> • Compare and contrast integrated pest management monitoring methods utilized in different community settings. • Compare integrated pest management to past practices. • Compare and analyze the long-term effects of using integrated pest management products. <p>3.4.7.A Describe concepts about the structure and properties of matter.</p> <ul style="list-style-type: none"> • Identify elements as basic building blocks of matter that cannot be broken down chemically. • Distinguish compounds from mixtures. • Describe and conduct 	<p>Eligible Content: S.7.A.2.2.1 Describe the safe and appropriate use of instruments and scales to accurately and safely make measurements under a variety of conditions.</p> <p>S.7.A.2.2.2 Apply measurement systems to record and interpret observations under a variety of conditions.</p> <p>S.7.A.2.2.3 Describe ways technology is used to enhance scientific study and/or human life.</p> <p>Essential Knowledge/Skills: Identify uses of tools, machines, materials, information, people, money, energy and time that meet specific design criteria.</p> <p>Describe safe procedures for using tools and materials. Assess materials for appropriateness of use</p>	<p>Microscope, diagrams, worksheets, text dependent articles</p>	<p>Teacher prepared tests, quizzes, etc.</p> <p>Series available assessments online. (Optional)</p>	<p>10 days</p>

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	<p>experiments that identify chemical and physical properties.</p> <ul style="list-style-type: none"> • Describe reactants and products of simple chemical reactions. <p>3.4.7.B Describe the use of models as an application of scientific or technological concepts.</p> <ul style="list-style-type: none"> • Identify and describe different types of models and their functions. • Apply models to predict specific results and observation (e.g., population growth, effects of infectious organisms). • Explain systems by outlining a system’s relevant parts and its purpose and/or designing a model that illustrates its function. <p>3.4.7. D Explain scale as a way of relating concepts and ideas to one another by some measure.</p> <ul style="list-style-type: none"> • Apply various applications of size and dimensions of scale to scientific, mathematical, and technological applications. • Describe scale as a form of ratio and apply to a life situation. 	<p>Select appropriate instruments to measure the size, weight, shape and temperature of living and non-living objects Apply knowledge of different measurement systems to measure and record objects properties.</p> <p>Vocabulary: Microscope Objectives Stage Stage clips Arm Base Diaphragm Magnification Nosepiece Body tube Shield Slide Specimen</p>			
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	<p>3.4.7. E Identify change as a variable in describing natural and physical systems.</p> <ul style="list-style-type: none">• Describe fundamental science and technology concepts that could solve practical problems.• Explain how ratio is used to describe change.• Describe the effect of making a change in one part of a system on the system as a whole. <p>PA Core Standards: Reading for Science and Technical Subjects, 6-12</p> <p>3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.</p> <p>PA Core Standards: Writing for Science and Technical Subjects, 6-12</p> <p>3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.</p>				
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PA Core Standards:

Reading for Science and Technical Subjects, 6-12

3.5 Reading Informational Text

Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.

Grades 6-8

CC.3.5.6-8.A.

Cite specific textual evidence to support analysis of science and technical texts.

CC.3.5.6-8.B.

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

CC.3.5.6-8.C.

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CC.3.5.6-8.D.

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

CC.3.5.6-8.E.

Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

CC.3.5.6-8.F.

Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

CC.3.5.6-8.G.

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CC.3.5.6-8.H.

Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

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CC.3.5.6-8.I.

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CC.3.5.6-8.J.

By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Core Standards:

Writing for Science and Technical Subjects, 6-12

3.6 Writing

Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.

Grades 6-8

CC.3.6.6-8.A.

Write arguments focused on discipline-specific content.

- Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
- Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
- Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from and supports the argument presented.

CC.3.6.6-8.B.

Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

- Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
- Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Establish and maintain a formal style and objective tone.

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- Provide a concluding statement or section that follows from and supports the information or explanation presented.

CC.3.6.6-8.C.

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CC.3.6.6-8.D.

With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

CC.3.6.6-8.E.

Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

CC.3.6.6-8.F.

Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

CC.3.6.6-8.G.

Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

CC.3.6.6-8.H.

Draw evidence from informational texts to support analysis reflection, and research.

CC.3.6.6-8.J.I.

Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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Appendix: A

IEP Enhancements

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>All organisms are made of cells and can be characterized by common aspects of their structure and functioning.</p> <p>All living things have a common set characteristic needs and functions that separate them from nonliving things such as: gas exchange, energy usage, water usage, response, reproduction, elimination of waste, growth, and made of one or more cells.</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 20 days as specified in the curriculum and additional time as needed per individual student</p>

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General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>All organisms are made of cells and can be characterized by common aspects of their structure and functioning</p> <p>All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 20 days as specified in the curriculum and additional time as needed per individual student</p>

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General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>All organisms are made of cells and can be characterized by common aspects of their structures and functioning.</p> <p>Heredity refers to specific mechanisms by which characteristic or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.</p> <p>Living organisms reproduce in a variety of ways that may involve sexual or asexual reproduction. Reproduction usually follows a cycle.</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 45 days as specified in the curriculum and additional time as needed per individual student</p>

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General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>All organisms are made of cells and can be characterized by common aspects of their structures and functioning.</p> <p>In multicellular organisms, there is a systems framework of organization from cells to tissues, to organs to organ systems. These systems are specialized for particular body functions of an organism.</p> <p>Organisms have sense receptor that responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to a brain or processing center. These signals are processed and result in immediate behaviors or memories.</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 35 days as specified in the curriculum and additional time as needed per individual student</p>

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General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>All organisms are made of cells and can be characterized by common aspects of their structure and functioning.</p> <p>Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.</p> <p>Some organisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen.</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 10 days as specified in the curriculum and additional time as needed per individual student</p>

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General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.</p> <p>Organisms and populations of organisms are dependent on their environmental interactions, both biotic and abiotic factors.</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 40 days as specified in the curriculum and additional time as needed per individual student</p>

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General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
<p>Describe the safe and appropriate use of tools, material and techniques to answer questions and solve problems.</p> <p>Use appropriate instruments and apparatus to study materials.</p>	<ul style="list-style-type: none"> • Preferential Seating • Use of Computer (When Available) • Interactive Online Videos • Visual Aids • Anchor Charts • Breaking tasks down into more manageable increments. • Breaking down directions with one directive be given at a time. • Frequent breaks to maintain focus. • Modified Assignments - examples (not limited to) less questions on page, reduction of questions, reduced number of answers, larger font on typed worksheets, vocabulary words defined. • Extra time to complete assignments. • Additional textbook sent home. • Multi-Modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material. • Sample Problems provided. • Directions read aloud. • Colored overlay for reading. • Guided Reading Strip. • Larger Font. • Access to computer to type written responses. • Small group reteach. • One-on-one Instruction. • Larger lined paper for writing assignments. • Graphic Organizer. • Copy of notes provided. • Audio recordings of text. • Mark texts with highlighter. • Extended Wait time after asking a question 		<p>Assessments:</p> <ul style="list-style-type: none"> • Testing in a small group setting • Tests orally read to students • Limit 4 to 3 choices • Chunk word banks and matching sections into more manageable units • Long tests will be given to a student one page at a time • Oral responses to open ended questions • Alternative tests • Study Guides for Assessments <p>Suggested Time: 10 days as specified in the curriculum and additional time as needed per individual student</p>