First Grade Science

Curriculum Guide

Dunmore School District

Dunmore, PA

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Curriculum Guide

First Grade Science

Prerequisite:

- Completion of Kindergarten

Course Description:
The First Grade Science course is designed to provide students with a conceptual understanding of first grade science concepts as they pertain to the Pennsylvania State Core Standards. The course content gives students an introduction into various disciplines such as Physical, Life, and Earth Science. Students will delve deeper into these areas to further explore topics that include, but are not limited to, sound and light waves, how living things survive and adapt to their environment, and how living things are similar to and different from their parents. Students will gain an understanding that Earth and Space is composed of a variety of objects and systems.

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.

Dunmore School District
Curriculum Guide

Year-at-a-glance

Subject: First Grade Science	**Grade Level: 1**	**Date Completed: 3/20/2019**

1st Quarter

Topic	Resources	Standards
Physical Science: Vibrations Make Sound	Approved textbook, *Science*	3.4.4.C, 3.2.4.A, 3.2.4.B, 3.2.4.C
Physical Science: Light travels from place to place	Approved textbook, *Science*	3.4.4.C, 3.2.4.A, 3.2.4.B, 3.2.4.C
Physical Science: Materials that allow light to pass through	Approved textbook, *Science*	3.4.4.C, 3.4.4.B, 3.2.4.A, 3.2.4.B, 3.2.4.C
Physical Science: Objects that can be seen by light	Approved textbook, *Science*	3.2.4.B

2nd Quarter

Topic	Resources	Standards
Life Science: Technology changed how we observe living things	Approved textbook, *Science*	3.2.4.D, 3.8.4.A, 3.8.4.B
Life Science: How organisms live and grow	Approved textbook, *Science*	3.3.4.A, 3.3.4.B,3.1.4.A, 3.2.4.A, 3.2.4.B, 3.2.4.C, 4.7.4.A, 4.7.4.B
Life Science: External structures that help organisms grow and meet their needs	Approved textbook, *Science*	3.3.4.C, 3.1.7.C, 3.2.4.A, 3.2.4.B, 4.7.4.A, 4.7.4.B
Life Science: Behaviors that help offspring survive	Approved textbook, *Science*	3.3.4.A, 3.3.4.B, 3.1.4.A, 3.2.4.A

3rd Quarter

Topic	Resources	Standards
Life Science: Physical characteristics shared by plants or animals	Approved textbook, *Science*	3.3.4.C, 3.1.7.C, 3.2.4.A, 3.2.4.B, 3.2.4.C, 4.7.4.A, 4.7.4.B
Life Science: How plants and animals are similar and different from their parents	Approved textbook, *Science*	3.3.4.C, 3.1.7.C, 3.2.4.A, 3.2.4.B, 3.2.4.C, 3.3.4.C, 4.7.4.A
Life Science: Life cycles of plants and animals	Approved Text book, *Science*	3.1.4.C, 3.1.4.E, 3.3.4.A, 3.3.4.C, 3.1.7.C, 3.2.4.A, 3.2.4.B, 3.2.4.C, 4.7.4.A, 4.7.4.B

4th Quarter

Topic	Resources	Standards
Earth Science: Earth, moon, and sun systems	Approved textbook, *Science*	3.4.4.D, 3.1.4.C, 3.1.4.A, 3.1.7.A, 3.2.4.A, 3.2.4.B, 3.2.4.C
Earth Science Sun, moon, and Earth movements relate to time	Approved textbook, *Science*	3.1.4.C, 3.2.4.B, 3.4.4.D
Space and Technology Patterns of the Earth, sun, and moon can be predicted	Approved textbook, *Science*	3.4.4.D, 3.1.4.C, 3.1.4.A, 3.1.7.A, 3.2.4.A, 3.2.4.B, 3.2.4.C
Space and Technology Tools that can be used to enhance observations	Approved textbook, *Science*	3.2.4.B

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter**	**Anchor Descriptor:** **S4.A.2.1** Apply skills necessary to conduct or design a solution to solve a problem. **S4.A.1.3** Recognize and describe change in natural or human- made systems and the possible effects of those changes. **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.C.3.1** Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion. **PA Academic Standards: Science** **3.4.4.C** Observe and describe different types of force and motion. • Identify characteristics of sound (pitch, loudness and echoes)	**Eligible Content:** **S4.A.2.1.4** State a conclusion that is consistent with the information/data. **S4.A.1.3.3** Observe and describe the change to objects caused by temperature change or light. _____ **Essential Knowledge/Skills:** **Sound can make matter vibrate, and vibrating matter can make sound.** Plan and conduct investigations to provide evidence that vibrating materials can make sound. **Vocabulary:** Energy Investigation Materials Sound Vibration Waves	**Approved textbook, *Science,*** **Chapter 9 Lesson 5**	**Teacher Observation**	**2 Weeks**

	• Recognize forces that attract or repel other objects and demonstrate them. • Describe various types of motions. • Compare the relative movement of objects and describe types of motion that are evident. • Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up). **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel- rough). • Use observations to				

	develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter**	**Anchor Descriptor:** **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **PA Academic Standards: Science** **3.4.4.C** Observe and describe different types of force and motion. • Identify characteristics of sound (pitch, loudness and echoes) • Recognize forces that attract or repel other objects and demonstrate them. • Describe various types of motions. • Compare the relative	**Eligible Content:** **S4.A.2.1.4** State a conclusion that is consistent with the information/data. **S4.A.1.3.3** Observe and describe the change to objects caused by temperature change or light. **Essential Knowledge/Skills:** **An object can be seen when light reflected from its surface enters the eyes.** Investigate and explain that for an object to be seen, light must be reflected off the object and enter the eye. **Vocabulary:** Energy Light Reflection Surface Wave	**Approved textbook,** ***Science,*** **Chapter 10 Lesson 3**	**Teacher Observation**	**1 Week**

	movement of objects and describe types of motion that are evident. • Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up). **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems.				

	• Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.**	**Anchor Descriptor:** **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **PA Academic Standards Science:** **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary.	**Eligible Content:** **S4.A.1.3.3** Observe and describe the change to objects caused by temperature change or light. **S4.A.2.1.3** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations. **Essential Knowledge/Skills:** **Light travels from place to place.** Make observations to construct an evidence based account that light travels from place to place. **Vocabulary:** Light	**Approved textbook,** ***Science,*** **Pages 288, 289**	**Teacher Observation**	**1 Week**

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.**	**Anchor Descriptor:** **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **PA Academic Standards: Science** **3.4.4.B** Know basic energy types, sources and conversions. • Identify energy forms and examples (e.g., sunlight, heat, stored, motion). • Know the concept of the flow of energy by measuring flow through an object or system. • Describe static electricity in terms of attraction, repulsion and sparks. • Apply knowledge of the basic electrical circuits to design	**Eligible Content:** **S4.A.2.1.4** State a conclusion that is consistent with the information/data. **Essential Knowledge/Skills:** **Mirrors can be used to reflect light.** Plan and conduct an investigation to redirect light beams using mirrors. **Vocabulary:** Light beam Mirror Reflection	**Approved textbook, *Science,*** **Use a flashlight and mirror to reflect light.**	**Teacher Observation**	**1 Week**

	and construction simple direct current circuits. • Classify materials as conductors and nonconductors. • Know and demonstrate the basic properties of heat by producing it in a variety of ways. • Know the characteristics of light (e.g., reflection, refraction, absorption) and use them to produce heat, color or a virtual image. **3.4.4.C** Observe and describe different types of force and motion. • Identify characteristics of sound (pitch, loudness and echoes) • Recognize forces that attract or repel other objects and demonstrate them. • Describe various types of motions. • Compare the relative movement of objects and describe types of motion that are evident. • Describe the position of an object by locating it relative to another object or the background (e.g., geographic				

	direction, left, up). **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment.				

	• State a conclusion that is consistent with the information.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	**Anchor Descriptor:** **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **PA Academic Standards: Science** **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.	**Eligible Content:** **S4.A.1.3.2** Describe relative size, distance, or motion. **S4.A.2.1.3** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations. **Essential Knowledge/Skills:** **Materials allow light to pass through them in varying degrees.** Investigate to determine the effect of placing objects made of different materials in a beam of light. **Vocabulary:** Materials	**Approved textbook,** ***Science,*** **Pages 298, 299**	**Teacher Observation**	**2 Weeks**

		Opaque Translucent Transparent			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.**	**Anchor Descriptor:** **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **PA Academic Standards: Science** **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel- rough). • Use observations to develop a descriptive vocabulary.	**Eligible Content:** **S4.A.2.1.3** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations. **Essential Knowledge/Skills:** **Objects can be seen if light is available to illuminate the object or if they give off their own light.** Make observations to construct an evidence-based account that objects can be seen when illuminated. **Vocabulary:** Illuminate Light	**Approved textbook,** ***Science,*** **Shine a flashlight on various objects in the dark to show how objects will illuminate.**	**Teacher Observations**	**1 Week**

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.**	**Anchor Descriptor:** **S4.A.2.2** Identify appropriate instruments for a specific task and describe the information the instrument can provide. **PA Academic Standards: Science** **3.2.4.D** Recognize and use the technological design process to solve problems. • Recognize and explain basic problems. • Identify possible solutions and their course of action. • Try a solution. • Describe the solution, identify its impacts and modify if necessary. • Show the steps taken and the results. **3.8.4.A** Know that people select, create and use science and technology and that they are limited by social and physical restraints. • Identify and describe positive and negative impacts that influence or result from new tools and	**Eligible Content:** **S4.A.2.2.1** Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length - ruler, mass - balance scale, volume -beaker, temperature - thermometer; making observations: hand lens, binoculars, telescope). **Essential Knowledge/Skills:** **A variety of devices are used to communicate over long distances.** Use tools and materials to design a device that uses light or sound to solve the problem of communicating over a distance. **Vocabulary:** Communicate Distance Sound	**Approved textbook,** ***Science,*** **Use plastic cups and string of various lengths to communicate.**	**Teacher Observation**	**1 Week**

	techniques. • Identify how physical technology (e.g., construction, manufacturing, transportation), informational technology and biotechnology are used to meet human needs. • Describe how scientific discoveries and technological advancements are related. • Identify interrelationships among technology, people and their world. Apply the technological design process to solve a simple problem. **3.8.4.B** Know how human ingenuity and technological resources satisfy specific human needs and improve the quality of life. • Identify and distinguish between human needs and improving the quality of life. • Identify and distinguish between natural and human-made resources. • Describe a technological invention and the				

	resources that were used to develop it.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.**	**Anchor Descriptors:** **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **PA Academic Standards: Science** **3.2.4.D** Recognize and use the technological design process to solve problems. • Recognize and explain basic problems. • Identify possible solutions and their course of action. • Try a solution. • Describe the solution, identify its impacts and modify if necessary. • Show the steps taken and the results. **3.8.4.A** Know that people select, create and use science and technology and that they are limited by social and physical restraints. • Identify and describe positive and negative impacts that influence or result from new tools and	**Eligible Content:** **S4.A.1.1.2** Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment. **Essential Knowledge/Skills:** **People depend on various technologies in their lives; human lives would be different without technology.** Design and build a device that uses light to communicate. **Vocabulary:** Communicate Design Device	**Approved textbook, *Science,*** **Find and discuss examples of ways light is used to communicate. (Ex: lighthouses)**	**Teacher Observation**	**1 Week**

	techniques. • Identify how physical technology (e.g., construction, manufacturing, transportation), informational technology and biotechnology are used to meet human needs. • Describe how scientific discoveries and technological advancements are related. • Identify interrelationships among technology, people and their world. • Apply the technological design process to solve a simple problem. **3.8.4.B** Know how human ingenuity and technological resources satisfy specific human needs and improve the quality of life. • Identify and distinguish between human needs and improving the quality of life. • Identify and distinguish between natural and human-made resources. • Describe a technological				

	invention and the resources that were used to develop it.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.**	**Anchor Descriptor:** **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **PA Academic Standards: Science** **3.3.4.A** Know the similarities and differences of living things. • Identify life processes of living things (e.g., growth, digestion, react to environment). • Know that some organisms have similar external characteristics (e.g., anatomical characteristics; appendages, type of body covering, body segments) and differences are related to environmental habitat. • Describe basic needs of plants and animals. **3.3.4.B** Know that living things are made up of parts that have specific functions. • Identify examples of unicellular and multicellular organisms. Determine how different parts of	**Eligible Content:** **S4.B.1.1.1** Identify life processes of living things (e.g., growth, digestion, respiration). **S4.B.1.1.2** Compare similar functions of external characteristics of organisms (e.g., anatomical characteristics: appendages, type of covering, body segments). **S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food). **S4.B.1.1.4** Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves). --- **Essential Knowledge/Skills:** **Organisms have external structures that serve various functions in growth, survival, behavior, and reproduction.** **Observe and categorize living and nonliving things by external characteristics.**	**Approved textbook,** ***Science,*** **Chapter 3 Lesson 1**	**Teacher Observation**	**2 Weeks**

	a living thing work together to make the organism function **3.1.4.A** Know that natural and human-made objects are made up of parts. • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made (e.g., ball point pen, simple electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change	**Vocabulary:** Organism Structures			

	existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. **4.7.4.A** Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that				

	living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4**.B Know that adaptations are important for survival. • Explain how specific adaptations can help a living organism to survive. • Explain what happens to a living thing when its food, water, shelter or space is changed				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.**	**Anchor Descriptor:** **S4.A.3.1** Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle). **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **PA Academic Standards: Science** **3.3.4.A** Know the similarities and differences of living things. • Identify life processes of living things (e.g., growth, digestion, react to environment). • Know that some organisms have similar external characteristics • (e.g., anatomical characteristics; • appendages, type of covering, body • segments) and that similarities and • differences are related to • environmental habitat. • Describe basic needs of	**Eligible Content:** **S4.A.3.1.1** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle). **S4.B.1.1.1** Identify life processes of living things (e.g., growth, digestion, respiration). **S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food). **Essential Knowledge/Skills:** **Organisms have external structures that help them survive, grow and meet their needs.** Make observations and describe the different parts of organisms that help them survive, grow, and meet their needs. **Vocabulary:**	**Approved textbook,** ***Science,*** **Chapter 3 Lesson 5**	**Teacher Observation**	**1 week**

	plants and animals. **3.3.4.B** Know that living things are made up of parts that have specific functions. • Identify examples of unicellular and multicellular organisms. Determine how different parts of a living thing work together to make the organism function **3.1.4.A** Know that natural and human-made objects are made up of parts. • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made (e.g., ball point pen, simple electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems.	Grow Movement Observations Parts (roots, leaves, flowers, stems, fruit) Reproduce Survival Survive			

	3.2.4.A Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the				

	information. **4.7.4.A** Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4.B** Know that adaptations are important for survival. • Explain how specific adaptations can help a living organism to survive. • Explain what happens to a living thing when its food, water, shelter or space is changed				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.**	**Anchor Descriptor:** **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **PA Academic Standards: Science** **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **3.1.7.C** Identify patterns as repeated processes or recurring elements in science and technology. • Identify different forms of patterns and use them to group and classify specific	**Eligible Content:** **S4.B.1.1.1** Identify life processes of living things (e.g., growth, digestion, respiration). **S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food). **S4.B.1.1.4** Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves). **S4.A.2.2.1** Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length -ruler, mass - balance scale, volume - beaker, temperature - thermometer; making observations: hand lens, binoculars, telescope). **Essential Knowledge/Skills:** **Organisms have external structures that help them survive, grow and meet their**	**Approved textbook,** ***Science,*** **Chapter 3 Lesson 3**	**Teacher Observations**	**2 weeks**

	objects. • Identify repeating structure patterns. • Identify and describe patterns that occur in physical systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary.	**needs.** Design a model that replicates the function of an organism's structure. **Vocabulary:** Behavior Model			

	3.2.4.C Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. **4.7.4.A** Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4.B** Know that adaptations are important for survival. • Explain how specific				

	adaptations can help a living organism to survive. • Explain what happens to a living thing when its food, water, shelter or space is changed.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning**.	**Anchor Descriptor:** **S4.A.3.1** Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle). **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **PA Academic Standards: Science** **3.3.4.A** Know the similarities and differences of living things. • Identify life processes of living things (e.g., growth, digestion, react to environment). • Know that some organisms have similar external characteristics (e.g., anatomical characteristics; appendages, type of covering, body segments) and that similarities and differences are related to environmental habitat. • Describe basic needs of plants and animals.	**Eligible Content:** **S4.A.3.1.1** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle). **S4.B.1.1.1** Identify life processes of living things (e.g., growth, digestion, respiration). **S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food). **Essential Knowledge/Skills:** **Parents and offspring engage in behaviors that help the offspring to survive.** Observe and determine patterns in behavior of parents and offspring that help offspring survive. **Vocabulary:** Behavior Observe Offspring	**Approved textbook,** ***Science,*** **Chapter 5 Lesson 1**	**Teacher Observation**	**2 Weeks**

	3.3.4.B Know that living things are made up of parts that have specific functions. • Identify examples of unicellular and multicellular organisms. • Determine how different parts of a living thing work together to make the organism function. **3.1.4.A** Know that natural and human-made objects are made up of parts. • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made (e.g., ball point pen, simple electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and	Patterns			

	technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.				

	4.7.4.A Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4.B** Know that adaptations are important for survival. • Explain how specific adaptations can help a living organism to survive. • Explain what happens to a living thing when its food, water, shelter or space is changed.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **Organisms have external structures that help them survive, grow and meet their needs.**	**Anchor Descriptor:** **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **PA Academic Standards: Science** **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **3.1.7.C** Identify patterns as repeated processes or recurring elements in science and technology. • Identify different forms of patterns and use them to group and classify specific objects. • Identify repeating structure patterns. • Identify and describe patterns	**Eligible Content:** **S4.B.1.1.1** Identify life processes of living things (e.g., growth, digestion, respiration). **S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food). **Essential Knowledge/Skills:** **Organisms have external structures that help them survive, grow and meet their needs.** Classify plants and animals according to physical characteristics they share. **Vocabulary:** Classify Physical characteristic	**Approved textbook,** ***Science,*** **Chapter 3 Lesson 4**	**Teacher Observation**	**1 week**

	that occur in physical systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or				

	events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. **4.7.4.A** Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4.B** Know that adaptations are important for survival. • Explain how specific adaptations can help a living organism to survive. • Explain what happens to a living thing when its				

	food, water, shelter or space is changed.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **Organisms have external structures that help them survive, grow and meet their needs**	**Anchor Descriptor:** **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **PA Academic Standards: Science** **3.2.4.D** Recognize and use the technological design process to solve problems. • Recognize and explain basic problems. • Identify possible solutions and their course of action. • Try a solution. • Describe the solution, identify its impacts and modify if necessary. • Show the steps taken and the results.	**Eligible Content:** **S4.A.1.1.2** Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment. **S4.B.1.1.3** Describe basic needs of plants and animals (e.g., air, water, food). _____ **Essential Knowledge/Skills:** **Every human made product is designed by applying knowledge of the natural world and is built using materials from nature.** Use materials to design a solution to a human problem by mimicking how plant or animals use their external parts to help them survive,	**Approved textbook,** ***Science,*** **Chapter 4 Lesson 6**	**Teacher Observations**	**2 weeks**

		grow and meet their needs. **Vocabulary:** Mimic Problem Solution			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **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.**	**Anchor Descriptor:** **S4.B.2.1** Identify and explain how adaptations help organisms to survive. **PA Academic Standards: Science** **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **3.1.7.C** Identify patterns as repeated processes or recurring elements in science and technology. • Identify different forms of patterns and use them to group and classify specific objects. • Identify repeating structure patterns. • Identify and describe patterns that occur in	**Eligible Content:** **S4.B.2.2.1** Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring. **_____** **Essential Knowledge/Skills:** **Young animals are very much but not exactly like their parents. Plants also are very much, but not exactly, like their parents.** Make observations and to construct an evidence-based account that young plants and animals are alike but not exactly like their parents. **Vocabulary:** Similar Vary	**Approved textbook,** ***Science,*** **Chapter 4 Lesson 1** **Chapter 4 Lesson 2**	**Teacher Observation**	**2 Weeks**

	physical systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about				

	objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. **4.7.4.A** Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical				

	characteristics that appear in both parents and offspring and differ between families, strains or species.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **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.**	**Anchor Descriptor:** **S4.A.3.3** Identify and make observations about patterns that regularly occur and reoccur in nature. **S4.B.2.1** Identify and explain how adaptations help organisms to survive. **S4.B.2.2** Identify that characteristics are inherited and, thus, offspring closely resemble their parents. **PA Academic Standards: Science** **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **3.1.7.C** Identify patterns as repeated processes or recurring	**Eligible Content:** **S4.A.3.3.1** Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle). **S4.B.2.1.2** Explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water). **S4.B.2.2.1** Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring. --- **Essential Knowledge/Skills:** **Adult plants and animals have young. In many kinds of animals, parents and the offspring engage in behaviors that help the offspring to survive.**	**Approved textbook,** ***Science,*** **Chapter 5 Lesson 2**	**Teacher Observations**	**3 Weeks**

	elements in science and technology. • Identify different forms of patterns and use them to group and classify specific objects. • Identify repeating structure patterns. • Identify and describe patterns that occur in physical systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of	Note patterns in characteristics or behaviors that appear in adult and offspring (e.g. hair color, eye color,). **Vocabulary:** Offspring Patterns			

	the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **4.7.4.A** Identify differences in				

	living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents. • Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4.B** Know that adaptations are important for survival. • Explain how specific adaptations can help a living organism to survive. • Explain what happens to a living thing when its food, water, shelter or space is changed				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **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.**	**Anchor Descriptor:** **S4.B.2.2** Identify that characteristics are inherited and, thus, offspring closely resemble their parents. **PA Academic Standards: Science** **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **3.1.7.C** Identify patterns as repeated processes or recurring elements in science and technology. • Identify different forms of patterns and use them to group and classify specific objects. • Identify repeating structure patterns. • Identify and describe	**Eligible Content:** **S4.B.2.2.1** Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring. **Essential Knowledge/Skills:** **Offspring resemble their parents, but can also vary in many ways.** Conduct an investigation (e.g. plant seeds, eggs) and cite evidence of change from young to adult. **Vocabulary:** Characteristics Evidence Inherit Offspring Parents	**Approved textbook,** ***Science,*** **Chapter 4 Lesson 2** **Chapter 4 Lesson 4**	**Teacher Observations**	**2 Weeks**

	patterns that occur in physical systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems.				

	• Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information. **3.3.4.C** Know that characteristics are inherited and, thus, offspring closely resemble their parents. • Identify characteristics for animal and plant survival in different climates. • identify physical characteristics that appear in both parents and offspring and differ between families, strains or species. **4.7.4.A** Identify differences in living things. • Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival. • Identify characteristics that living things inherit from their parents.				

	• Explain why each of the four elements in a habitat is essential for survival. • Identify local plants or animals and describe their habitat. **4.7.4.B** Know that adaptations are important for survival. • Explain how specific adaptations can help a living organism to survive. • Explain what happens to a living thing when its food, water, shelter or space is changed.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Life Science: **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.**	**Anchor Descriptor:** **S4.A.3.3** Identify and make observations about patterns that regularly occur and reoccur in nature. **S4.B.1.1** Identify and describe similarities and differences between living things and their life processes. **PA Academic Standards: Science** **3.1.4.C** Illustrate patterns that regularly occur and reoccur in nature. • Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, structural patterns in bird feathers). • Use knowledge of natural patterns to predict next occurrences (e.g., seasons, leaf patterns, lunar phases). **3.1.4.E** Recognize change in natural and physical systems. • Recognize change as fundamental to science and technology concepts.	**Eligible Content:** **S4.A.3.3.1** Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle). **S4.B.1.1.5** Describe the life cycles of different organisms (e.g., moth, grasshopper, frog, seed-producing plant). --- **Essential Knowledge/Skills:** **Plants and animals have a life cycle.** Observe and compare the stages of life cycles of organisms (plants & animals). **Vocabulary:** Plants Animals Life cycles	**Approved textbook,** ***Science,*** **Chapter 4 Lesson 5** **Chapter 4 Lesson 6**	**Teacher Observation**	**3 Weeks**

	• Examine and explain change by using time and measurement. • Describe relative motion. • Describe the change to objects caused by heat, cold, light or chemicals. **3.3.4.A** Know the similarities and differences of living things. • Identify life processes of living things (e.g., growth, digestion, react to environment). • Know that some organisms have similar external characteristics • (e.g., anatomical characteristics; appendages, type of covering, body segments) and that similarities and differences are related to environmental habitat. • Describe basic needs of plants and animals.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.**	**Anchor Descriptor:** **S4.D.3.1** Describe Earth's relationship to the sun and the moon. **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **S4.A.2.2** Identify appropriate instruments for a specific task and describe the information the instrument can provide. **S4.A.3.1** Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple	**Eligible Content:** **S4.D.3.1.1** Describe motions of the Sun - Earth - Moon system. **S4.D.3.1.2** Explain how the motion of the Sun -Earth - Moon system relates to time (e.g., days, months, years). **Essential Knowledge/Skills:** **Observable changes and patterns in the sky are caused by motions in the Earth-moon-sun system.** Use observations of stars, moon, and sun in the day and night sky to describe patterns that can be predicted. **Vocabulary:** Changes Describe Moon Observe Pattern Predict Star Sun System	**Approved textbook,** ***Science,*** **Chapter 11 Lesson 1**	**Teacher Observation**	**1 Week**

	machines, water cycle). **S4.A.3.2** Use models to illustrate simple concepts and compare the models to what they represent**.** **S4.A.3.3** Identify and make observations about patterns that regularly occur and reoccur in nature. **PA Academic Standards: Science** **3.4.4.D** Describe the composition and structure of the universe and the earth's place in it. • Recognize earth's place in the solar system. • Explain and illustrate the causes of seasonal changes. • Identify planets in our solar system and their general characteristics. • Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases and eclipses. **3.1.4.A** Illustrate patterns that regularly occur and reoccur in nature. • Identify observable patterns (e.g., growth patterns in plants, crystal shapes in				

	minerals, climate, structural patterns in bird feathers). • Use knowledge of natural patterns to predict next occurrences (e.g., seasons, leaf patterns, lunar phases). **3.1.4.A** Know that natural and human-made objects are made up of parts. • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made (e.g., ball point pen, simple electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.1.7.A** Explain the parts of a simple system and their relationship to each other. • 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. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive				

	vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.**	**Anchor Descriptor:** **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.D.3.1** Describe Earth's relationship to the Sun and the Moon. **PA Academic Standards: Science** **3.1.4.C** Illustrate patterns that regularly occur and reoccur in nature. • Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, structural patterns in bird feathers). • Use knowledge of natural patterns to predict next occurrences (e.g., seasons, leaf patterns, lunar phases). **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-	**Eligible Content:** **S4.A.1.3.1** Observe and record change by using time and measurement. **S4.D.3.1.2** Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years). **Essential Knowledge/Skills:** **The motion of the sun, moon and earth relates to time. (days, months, years).** Use observations to compare the motion of the sun, earth and moon as it relates to time. **Vocabulary:** Earth Moon Motion Sun	**Approved textbook,** ***Science,*** **Chapter 11 Lesson 2**	**Teacher Observation**	**2 Weeks**

	rough). • Use observations to develop a descriptive vocabulary. **3.4.4.D** Describe the composition and structure of the universe and the earth's place in it. • Recognize earth's place in the solar system. • Explain and illustrate the causes of seasonal changes. • Identify planets in our solar system and their general characteristics. • Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases and eclipses.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.**	**Anchor Descriptor:** **S4.A.3.1** Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle). **PA Academic Standards: Science** **3.4.4.D** Describe the composition and structure of the universe and the earth's place in it. • Recognize earth's place in the solar system. • Explain and illustrate the causes of seasonal changes. • Identify planets in our solar system and their general characteristics. • Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases and eclipses. **3.1.4.A** Know that natural and human-made objects are made up of parts. • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made	**Eligible Content:** **S4.A.3.1.1** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle). **S4.A.3.1.2** Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium). **Essential Knowledge/Skills:** **Observable changes and patterns in the sky are caused by motions in the Earth-moon-sun system.** Observe and describe patterns of objects in the sky that are cyclic and can be predicted. **Vocabulary:** Patterns	**Approved textbook,** ***Science,*** **Chapter 11 Lesson 3**	**Teacher Observation**	**1 Week**

	(e.g., ball point pen, simple electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.1.4.C** Illustrate patterns that regularly occur and reoccur in nature. • Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, structural patterns in bird feathers). • Use knowledge of natural patterns to predict next occurrences (e.g. seasons, leaf patterns, lunar phases). **3.1.7.A** Explain the parts of a simple system and their relationship to each other. • 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. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary.				

	3.2.4.C Recognize and use the elements of scientific inquiry to solve problems. • Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Space and Technology: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.**	**Anchor Descriptor:** **S4.D.3.1** Describe Earth's relationship to the sun and the Moon. **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **S4.A.2.2** Identify appropriate instruments for a specific task and describe the information the instrument can provide. **S4.A.3.1** Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle).	**Eligible Content:** **S4.D.3.1.1** Describe motions of the Sun - Earth -Moon system. **S4.D.3.1.2** Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years). **S4.D.3.1.3** Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis. _____ **Essential Knowledge/Skills:** **Patterns of the motion of the sun, moon and stars in the sky can be observed, described and predicted.** Observe, describe, and predict patterns of daily change in the appearance and visibility of the moon and sun. **Vocabulary:** Predict Sky Sunrise	**Approved textbook,** ***Science,*** **Chapter 11 Lesson 3**	**Teacher Observation**	**2 Weeks**

	S4.A.3.2 Use models to illustrate simple concepts and compare the models to what they represent**.** **S4.A.3.3** Identify and make observations about patterns that regularly occur and reoccur in nature. **PA Academic Standards: Science** **3.4.4.D** Describe the composition and structure of the universe and the earth's place in it. • Recognize earth's place in the solar system. • Explain and illustrate the causes of seasonal changes. • Identify planets in our solar system and their general characteristics. • Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases and eclipses. **3.1.4.A** Know that natural and human-made objects are made up of parts. • Identify and describe what parts make up a system. • Identify system parts that are natural and human-made (e.g., ball point pen, simple	Sunset			

	electrical circuits, plant anatomy). • Describe the purpose of analyzing systems. • Know that technologies include physical technology systems (e.g., construction, manufacturing, transportation), informational systems and biochemical-related systems. **3.1.4.C** Illustrate patterns that regularly occur and reoccur in nature. • Identify observable patterns (e.g., growth patterns in plants, crystal shapes in minerals, climate, structural patterns in bird feathers). • Use knowledge of natural patterns to predict next occurrences (e.g. seasons, leaf patterns, lunar phases). **3.1.7.A** Explain the parts of a simple system and their relationship to each other. • 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. **3.2.4.A** Identify and use the nature of scientific and technological knowledge. • Distinguish between a scientific fact and a belief. • Provide clear explanations that account for observations and results. • Relate how new information can change existing perceptions. **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary. **3.2.4.C** Recognize and use the elements of scientific inquiry to solve problems.				

	• Generate questions about objects, organisms and/or events that can be answered through scientific investigations. • Design an investigation. • Conduct an experiment. • State a conclusion that is consistent with the information.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.**	**Anchor Descriptor:** **S4.D.3.1** Describe Earth's relationship to the Sun and the Moon. **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.A.2.1** Apply skills necessary to conduct an experiment or design a solution to solve a problem. **PA Academic Standards: Science** **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary.	**Eligible Content:** **S4.D.3.1.1** Describe motions of the Sun - Earth -Moon system. **S4.D.3.1.2** Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years). _____ **Essential Knowledge/Skills:** **Seasonal patterns of sunrise and set can be observed, described and predicted.** Observe, describe, and predict patterns of seasonal change in the timing and position of sunrise and sunset. **Vocabulary:** Sunrise Sunset	**Approved textbook,** ***Science,*** **Chapter 7 Lesson 4**	**Teacher Observation**	**2 Weeks**

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Space and Technology: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.**	**Anchor Descriptor:** **S4.A.2.2** Identify appropriate instruments for a specific task and describe the information the instrument can provide. **S4.A.1.1** Identify and explain the application of scientific, environmental, or technological knowledge to possible solutions to problems. **S4.A.1.3** Recognize and describe change in natural or human-made systems and the possible effects of those changes. **S4.A.3.2** Use models to illustrate simple concepts and compare the models to what they represent. **S4.A.3.3** Identify and make observations about patterns that regularly occur and reoccur in nature. **PA Academic Standards: Science** **3.2.4.B** Describe objects in the world using the five senses. • Recognize observational descriptors from each of the	**Eligible Content:** **S4.A.1.3.1** Observe and record change by using time and measurement. **S4.A.2.2.1** Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length -ruler, mass - balance scale, volume - beaker, temperature - thermometer; making observations: hand lens, binoculars, telescope). **S4.A.3.3.1** Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle). **S4.A.3.3.2** Predict future conditions/events based on observable patterns (e.g., day/night, seasons, sunrise/sunset, lunar phases). **S4.D.3.1.1** Describe motions of the Sun - Earth - Moon system. **S4.D.3.1.2** Explain how the motion of the Sun -Earth - Moon system relates to time	**Approved textbook,** ***Science,*** **Chapter 7 Lesson 1**	**Teacher Observation**	**2 Weeks**

	five senses (e.g., see-blue, feel-rough). • Use observations to develop a descriptive vocabulary.	(e.g., days, months, years). **Essential Knowledge/Skills: Through the use of tools and or media objects can be observed more clearly than with the naked eye.** Use scientific tools such as binoculars or telescopes to enhance observations. **Vocabulary:** Binocular Telescope Tools			

Appendix: A			
IEP Enhancements			
General Topic:	**Specially Designed Instruction:**	**Additional Vocabulary:**	**Assessments/Suggested Time:**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **Sound can make matter vibrate, and vibrating matter can make sound.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **An object can be seen when light reflected from its surface enters the eyes.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **Light travels from place to place.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **Mirrors can be used to reflect light.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **Materials allow light to pass through them in varying degrees.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **Objects can be seen if light is available to illuminate the object or if they give off their own light.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **A variety of devices are used to communicate over long distances.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Physical Science: **Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.** **People depend on various technologies in their lives; human lives would be different without technology.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.** **Organisms have external structures that serve various functions in growth, survival, behavior, and reproduction. Observe and categorize living and nonliving things by external characteristics.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.** **Organisms have external structures that help them survive, grow and meet their needs.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.** **Parents and offspring engage in behaviors that help the offspring to survive.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**
Life Science: **All organisms are made of cells and can be characterized by common aspects of their structure and functioning.** **Every human made product is designed by applying knowledge of the natural world and is built using materials from nature.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Life Science: **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.** **Young animals are very much but not exactly like their parents. Plants also are very much, but not exactly, like their parents.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Life Science: **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.** **Adult plants and animals have young. In many kinds of animals, parents and the offspring engage in behaviors that help the offspring to survive.**	• **Preferential Seating** • **Manipulatives** • **Visual a Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Life Science: **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.** **Offspring resemble their parents, but can also vary in many ways.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Life Science: **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.** **Plants and animals have a life cycle.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **3 weeks with additional time as needed per individual student**
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.** **Observable changes and patterns in the sky are caused by motions in the Earth-moon-sun system.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.** **The motion of the sun, moon and earth relates to time. (days, months, years).**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **1 week with additional time as needed per individual student**
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.** **Patterns of the motion of the sun, moon and stars in the sky can be observed, described and predicted.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**

General Topic:	Specially Designed Instruction:	Additional Vocabulary:	Assessments/Suggested Time:
Earth Science: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.** **Seasonal patterns of sunrise and set can be observed, described and predicted.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**
Space and Technology: **The universe is composed of a variety of different objects, which are organized into systems each of, which develops according to accepted physical processes and laws.** **Through the use of tools and or media objects can be observed more clearly than with the naked eye.**	• **Preferential Seating** • **Manipulatives** • **Visual Aids** • **Multi-modality instruction including modeling, explicit instruction, repetition, rephrasing, visual cues, and chunking of material**		**Suggested Time:** **2 weeks with additional time as needed per individual student**