SUBJECT: Science	**GRADE:** 4
UNIT TITLE: Human Body, Vision, and the Brain	
UNIT OVERVIEW	
In this unit, students investigate structures and functions of the human body. Students explore how our bones and muscles are interconnected, how our eyes interact with light and impact our vision, and how our brain responds to stimuli in our environment.	
LRG SKILLS AND DISPOSITIONS	**STANDARDS**
● Communication and Empathy ● Collaboration and Teamwork ● Critical Thinking and Problem Solving ● Creativity and Innovation	**PA STEELS Standards** ● 3.1.4.A. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. ● 3.1.4.B. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. ● 3.2.4.F. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. ● 3.5.3-5.FF. Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used. ● 3.5.3-5.GG. Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.
COMPETENCIES	**LEARNING TARGETS**
Competency: I can examine and evaluate the patterns, processes, and relationships of living organisms.	● I can construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. (CODE) ● I can use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. (CODE)
Competency: I can examine and evaluate what things are	● I can develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. (CODE)

made of and how they interact with each other.	
Competency: I can examine and evaluate the interactions among technology, engineering, and society.	● I can compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used. (CODE) ● I can describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation. (CODE)

SUBJECT: Science	**GRADE:** 4
UNIT TITLE: Animal and Plant Adaptations	
UNIT OVERVIEW	
In this unit, students explore the adaptations of animals and plants. Students investigate how the external and internal structures of organisms work together as an interconnected system that aids in their growth and survival. They also use models to explore how a combination of instincts and memories influence animal behavior.	
LRG SKILLS AND DISPOSITIONS	**STANDARDS**
● Communication and Empathy ● Collaboration and Teamwork ● Critical Thinking and Problem Solving ● Creativity and Innovation	**PA STEELS Standards** ● 3.1.4.A. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. ● 3.1.4.B. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

COMPETENCIES	LEARNING TARGETS
Competency: I can examine and evaluate the patterns, processes, and relationships of living organisms.	• I can construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. (CODE) • I can use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. (CODE)

SUBJECT: Science	**GRADE:** 4
UNIT TITLE: Earth's Features and Processes	
UNIT OVERVIEW	
In this unit, students investigate features and processes of the Earth's surface. Students explore the rapid process of volcanic eruptions. In contrast, students also explore the gradual Earth processes of weathering and erosion. Students apply their knowledge and design solutions to mitigate the impact of these processes on humans.	
LRG SKILLS AND DISPOSITIONS	**STANDARDS**
• Communication and Empathy • Collaboration and Teamwork • Critical Thinking and Problem Solving • Creativity and Innovation	**PA STEELS Standards** • 3.3.4.A. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. • 3.3.4.B. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. • 3.3.4.C. Analyze and interpret data from maps to describe patterns of Earth's features. • 3.3.4.E. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. • 3.5.3-5.J. Explain how technologies are developed or adapted when individual or societal needs and wants change.

	● 3.5.K-2.O. Illustrate that there are different solutions to a design and that none are perfect. ● 3.5.3-5.P. Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
COMPETENCIES	**LEARNING TARGETS**
Competency: I can examine and evaluate processes that operate on Earth and in space.	● I can analyze and interpret data from maps to describe patterns of Earth's features. (CODE) ● I can identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape. (CODE) ● I can make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. (CODE) ● I can generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. (CODE)
Competency: I can examine and evaluate the interactions among technology, engineering, and society.	● I can explain how technologies are developed or adapted when individual or societal needs and wants change. (CODE)
Competency: I can create, utilize, and assess new and existing designs.	● I can illustrate that there are multiple approaches to design. (CODE) ● I can evaluate the strengths and weaknesses of existing design solutions, including my own solutions. (CODE)

SUBJECT: Science	**GRADE:** 4
UNIT TITLE: Sounds, Waves, and Communication	
UNIT OVERVIEW	
In this unit, students investigate the science of sound. Students construct physical devices to feel the vibrations that allow us to communicate across distances. Students also use digital devices to visualize the characteristics of different sound waves that cause us to hear different things.	

LRG SKILLS AND DISPOSITIONS	STANDARDS
● Communication and Empathy ● Collaboration and Teamwork ● Critical Thinking and Problem Solving ● Creativity and Innovation	**PA STEELS Standards** ● 3.2.4.E. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. ● 3.2.4.G. Generate and compare multiple solutions that use patterns to transfer information.
COMPETENCIES	**LEARNING TARGETS**
Competency: I can examine and evaluate what things are made of and how they interact with each other.	● I can generate and compare multiple solutions that use patterns to transfer information. (CODE) ● I can develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. (CODE)

SUBJECT: Science	**GRADE:** 4
UNIT TITLE: Energy, Energy Transfer, and Electricity	
UNIT OVERVIEW	
In this unit, students explore energy. Students investigate how energy is stored, how it can make objects move, and how collisions transfer energy between objects. Students also construct chain reaction machines to explore the many different ways that energy can be transferred.	
LRG SKILLS AND DISPOSITIONS	**STANDARDS**

• Communication and Empathy • Collaboration and Teamwork • Critical Thinking and Problem Solving • Creativity and Innovation	**PA STEELS Standards** • 3.2.4.A. Use evidence to construct an explanation relating the speed of an object to the energy of that object. • 3.2.4.C. Ask questions and predict outcomes about the changes in energy that occur when objects collide. • 3.2.4.D. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. • 3.5.3-5.DD. Demonstrate how simple technologies are often combined to form more complex systems. • 3.5.3-5.HH. Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.
COMPETENCIES	**LEARNING TARGETS**
Competency: I can examine and evaluate what things are made of and how they interact with each other.	• I can use evidence to construct an explanation relating the speed of an object to the energy of that object. (CODE) • I can ask questions and predict outcomes about the changes in energy that occur when objects collide. (CODE) • I can apply scientific ideas to design, test, and refine a device that converts energy from one form to another. (CODE)
Competency: I can examine and evaluate the interactions among technology, engineering, and society.	• I can demonstrate how simple technologies are often combined to form more complex systems. (CODE) • I can differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems. (CODE)

SUBJECT: Science	**GRADE:** 4
UNIT TITLE: Electricity, Light, and Heat	
UNIT OVERVIEW	
In this unit, students explore the different forms of energy. Students investigate how energy can change form from heat energy into electrical energy. Students also construct devices that convert energy from one form into another, such as heat into motion and electric	
LRG SKILLS AND DISPOSITIONS	**STANDARDS**
● Communication and Empathy ● Collaboration and Teamwork ● Critical Thinking and Problem Solving ● Creativity and Innovation	**<u>PA STEELS Standards</u>** ● 3.3.4.D. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. ● 3.2.4.B. Make and communicate observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. ● 3.2.4.D. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. ● 3.4.3-5.B. Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions. ● 3.5.3-5.D. Predict how certain aspects of their daily lives would be different without given technologies. ● 3.5.3-5.E. Explain why responsible use of technology requires sustainable management of resources. ● 3.5.3-5.F. Classify resources used to create technologies as either renewable or nonrenewable. ● 3.5.3-5.G. Describe the helpful and harmful effects of technology. ● 3.5.3-5.DD. Demonstrate how simple technologies are often combined to form more complex systems. ● 3.5.3-5.HH. Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.
COMPETENCIES	**LEARNING TARGETS**

Competency: I can examine and evaluate processes that operate on Earth and in space.	• I can obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. (CODE)
Competency: I can examine and evaluate what hings are made of and how they interact with each other.	• I can make and communicate observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. (CODE) • I can apply scientific ideas to design, test, and refine a device that converts energy from one form to another. (CODE)
Competency: I can examine and evaluate the interactions among technology, engineering, and society.	• I can demonstrate how simple technologies are often combined to form more complex systems. (CODE) • I can differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems. (CODE) • I can classify resources used to create technologies as either renewable or nonrenewable. (CODE) • I can explain why responsible use of technology requires sustainable management of resources. (CODE) • I can describe the helpful and harmful effects of technology. (CODE) • I can predict how certain aspects of my daily life would be different without given technologies. (CODE)
Competency: I can examine and evaluate practices, ecological processes, and systems that comprise the environment.	• I can make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions. (CODE)