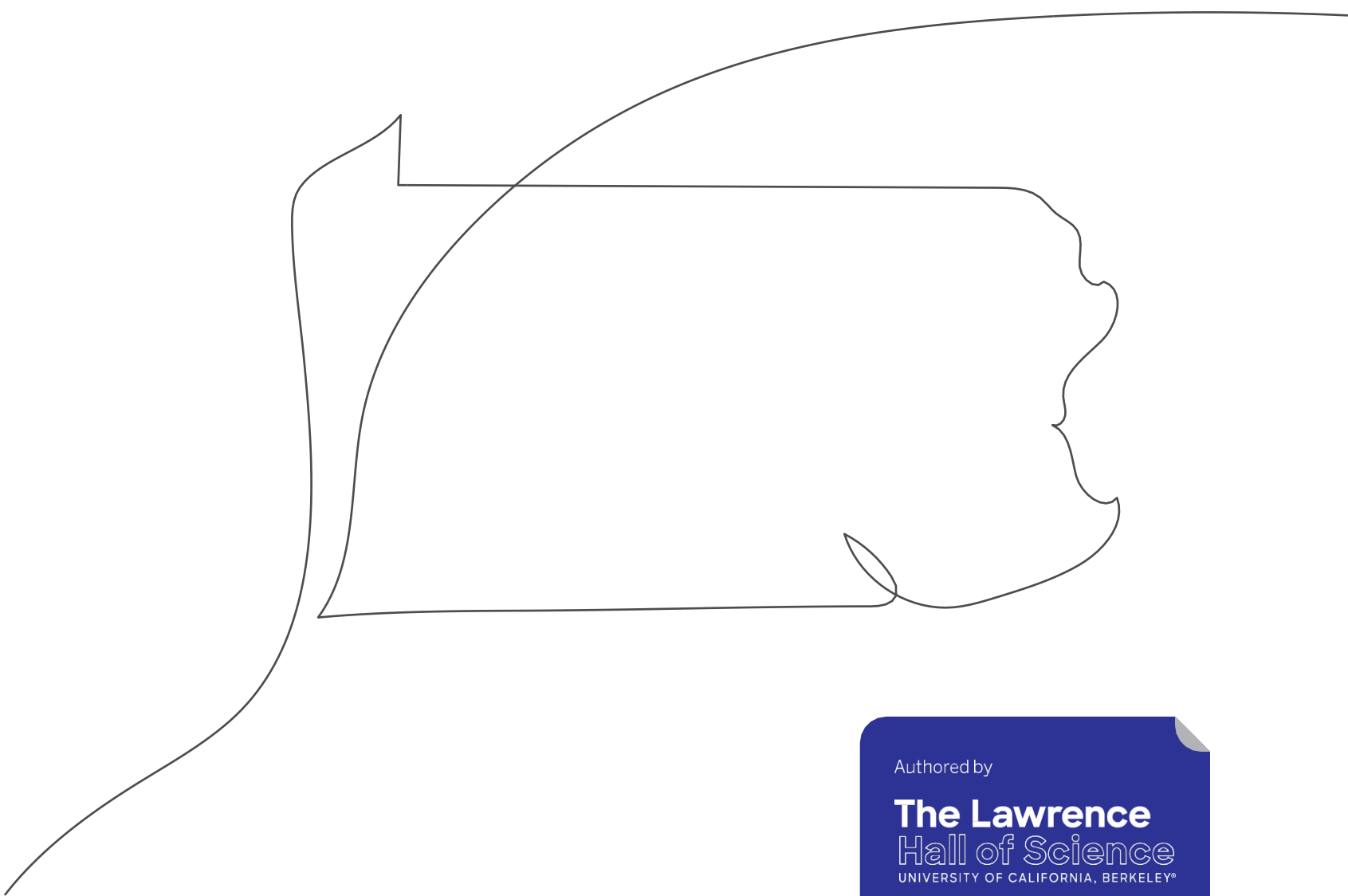


Pennsylvania Science Technology & Engineering, Environmental Literacy & Sustainability (STEELS) Standards Alignment



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PENNSYLVANIA STEELS STANDARDS

Kindergarten

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Organization for Matter and Energy Flow in Organisms	3.1.K.A	Use observations to describe patterns of what plants and animals (including humans) need to survive.	Needs of Plants and Animals
Forces and Motion	3.2.K.A	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Pushes and Pulls
Types of Interactions	3.2.K.B	Analyze data to determine if a design solution works as Intended to change the speed or direction of an object with a push or pull.	Pushes and Pulls
Conservation of Energy and Energy Transfer	3.2.K.C	Make observations to determine the effect of sunlight on Earth's surface.	Needs of Plants and Animals
	3.2.K.D	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.	Pushes and Pulls
Weather and Climate	3.3.K.A	Use and share observations of local weather conditions to describe patterns over time.	Sunlight and Weather
Biogeology	3.3.K.B	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	Needs of Plants and Animals
Natural Resources	3.3.K.C	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.	Needs of Plants and Animals
Natural Hazards	3.3.K.D	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.	Sunlight and Weather
			Needs of Plants and Animals
Human Impact on Earth Systems	3.3.K.E	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.	Needs of Plants and Animals

Grade 1

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Structure and Function	3.1.1.A	Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs..	Animal and Plant Defenses
Growth and Development of Organisms	3.1.1.B	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive	Animal and Plant Defenses
Inheritance of Traits	3.1.1.C	Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Animal and Plant Defenses
Wave Properties	3.2.1.A	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	Light and Sound
Electromagnetic Radiation	3.2.1.B	Make observations to construct an evidence-based account that objects can be seen only when illuminated.	Light and Sound Spinning Earth
	3.2.1.C	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	Light and Sound
Information Technologies and Instrumentation	3.2.1.D	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	Light and Sound
The Universe and its Stars	3.3.1.A	Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Spinning Earth
Earth and the Solar System	3.3.K.E	Make observations at different times of year to relate the amount of daylight to the time of year.	Spinning Earth

PENNSYLVANIA STEELS STANDARDS

Grade 2

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Independent Relationships in Ecosystems	3.1.2.A	Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Plant and Animal Relationships
	3.1.2.B	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	Plant and Animal Relationships
Biodiversity and Humans	3.1.2.C	Make observations of plants and animals to compare the diversity of life in different habitats.	Plant and Animal Relationships
Structure and Properties of Matter	3.2.2.A	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	Properties of Materials
	3.2.2.B	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.	Properties of Materials
	3.2.2.C	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.	Properties of Materials
Chemical Reactions	3.2.2.D	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.	Properties of Materials
The History of Planet Earth	3.3.2.A	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	Changing Landforms
Earth Materials and Systems	3.3.2.B	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	Changing Landforms
Plate Tectonics and Large-Scale System Interactions	3.3.2.C	Develop a model to represent the shapes and kinds of land and bodies of water in an area.	Changing Landforms
The Roles of Water in Earth's Surface Processes	3.3.2.D	Obtain information to identify where water is found on Earth and that it can be solid or liquid.	Changing Landforms
			Plant and Animal Relationships

K-2 Environmental Literacy and Sustainability

Agricultural and Environmental Systems and Resources

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Agricultural Systems	3.4.K-2.A	Categorize ways people harvest, redistribute, and use natural resources.	Needs of Plants and Animals Energy Conversions (4) <i>Note: Amplify Science does not include activities in which students explicitly categorize the ways people harvest, redistribute, and use natural resources, but the topics themselves are covered in the above units.</i>
Environment and Society	3.4.K-2.B	Examine how people from different cultures and communities, including one's own, interact and express their beliefs about nature.	Sunlight and Weather

Environmental Literacy Skills

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Environmental Experiences	3.4K-2.C	Explain ways that places differ in their physical characteristics, their meaning, and their value and/or importance.	Changing Landforms Plant and Animal Relationships Earth's Features (4) <i>Note: This standard is most closely aligned to a 4th-grade unit, but is implicitly explored in this grade band.</i>

Sustainability and Stewardship

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Environmental Sustainability	3.4K-2.D	Plan and carry out an investigation to address an issue in the local environment and community.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

PENNSYLVANIA STEELS STANDARDS

K-2 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Applying, Maintaining, and Assessing Technological Products and Systems Impacts of Technology Influence of Society on Technological Development	3.5.K-2.A	Identify and use everyday symbols.	<i>This standard is addressed implicitly throughout Amplify Science. For one example, see Lesson 2.5 in the unit Light and Sound.</i>
	3.4.K-2.B	Describe qualities of everyday products.	Properties of Materials
	3.5.K-2.C	Explain ways that technology helps with everyday tasks.	Light and Sound
	3.5.K-2.D	Select ways to reduce, reuse, and recycle resources in daily life.	Needs of Plants and Animals
	3.5.K-2.E	Illustrate helpful and harmful effects of technology.	Sunlight and Weather Needs of Plants and Animals Light and Sound Energy Conversions (4) <i>Note: Because the NGSS does not include exploration of harmful effects until grades 3-5, Amplify Science does not address this content until grade 3.</i>
	3.5.K-2.E	Investigate the use of technologies in the home and community.	Sunlight and Weather Needs of Plants and Animals Light and Sound
	3.5.K-2.G	Explain the tools and techniques that people use to help them do things.	Properties of Materials
	3.5.K-2.H	Explain the needs and wants of individuals and societies.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
	3.5.K-2.I	Compare simple technologies to evaluate their impacts.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound

K-2 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Applying, Maintaining, and Assessing Technological Products and Systems Impacts of Technology Influence of Society on Technological Development	3.5.K-2.I	Design new technologies that could improve their daily lives.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
	3.5.K-2.K	Safely use tools to complete tasks.	<i>This standard is addressed implicitly throughout Amplify Science. For one example, see Lesson 4.2 in the unit Animal and Plant Defenses.</i>
	3.5.K-2.C	Explore how technologies are developed to meet individual and societal needs and wants.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
Design and Design Thinking in Technology and Engineering Education	3.5.K-2.M	Demonstrate essential skills of the engineering design process.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
	3.5.K-2.N	Analyze how things work.	Pushes and Pulls Sunlight and Weather Light and Sound Properties of Materials
	3.5.K-2.O	Illustrate that there are different solutions to a design and that none are perfect.	Light and Sound Properties of Materials

PENNSYLVANIA STEELS STANDARDS

K-2 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Design and Design Thinking in Technology and Engineering Education	3.5.K-2.P	Discuss that all designs have different characteristics that can be described.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
	3.5.K-2.O	Apply skills necessary for making in design.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
	3.5.K-2.R	Draw connections between technology and human experiences.	Energy Conversions (4)
	3.5.K-2.S	Apply design concepts, principles, and processes through play and exploration.	Light and Sound Pushes and Pulls
	3.5.K-2.T	Demonstrate that designs have requirements.	Properties of Materials
	3.5.K-2.U	Explain that design is a response to wants and needs.	Pushes and Pulls Needs of Plants and Animals Sunlight and Weather Light and Sound Plant and Animal Relationships Properties of Materials Changing Landforms
Integration of Knowledge, Technologies, and Practices	3.5.K-2.V	Explain that materials are selected for use because they possess desirable properties and characteristics.	Properties of Materials
	3.5.K-2.W	Apply concepts and skills from technology and engineering activities that reinforce concepts and skills across multiple content areas.	Pushes and Pulls Light and Sound Properties of Materials

K-2 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Integration of Knowledge, Technologies, and Practices	3.5.K-2.X	Develop a plan in order to complete a task.	Pushes and Pulls
			Light and Sound
			Properties of Materials
			Plant and Animal Relationships
Nature and Characteristics of Technology and Engineering Core Concepts of Technology and Engineering History of Technology	3.5.K-2.Y	Discuss how the way people live and work has changed throughout history because of technology.	Energy Conversions (4)
	3.5.K-2.Z	Illustrate how systems have parts or components that work together to accomplish a goal	Properties of Materials
	3.5.K-2.AA	Demonstrate that creating can be done by anyone.	<i>This standard is addressed implicitly throughout Amplify Science. For one example, see Lesson 4.1 in the unit Animal and Plant Defenses</i>
	3.5.K-2.BB	Compare the natural world and human-made world.	Animal and Plant Defenses
	3.5.K-2.CC	Discuss the roles of scientists, engineers, technologists and others who work with technology.	Sunlight and Weather
	3.5.K-2.DD	Collaborate effectively as a member of a team.	Pushes and Pulls

PENNSYLVANIA STEELS STANDARDS

Grade 3

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Ecosystem Dynamics, Functioning, and Resilience	3.1.3.A	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	Inheritance and Traits
Social Interactions and Group Behavior	3.1.3.B	Construct an argument that some animals form groups that help them survive.	Inheritance and Traits
Inheritance of Traits	3.1.3.C	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	Inheritance and Traits
Variation of Traits	3.1.3.D	Use evidence to support the explanation that traits can be influenced by the environment.	Inheritance and Traits
Evidence of Common Ancestry and Diversity	3.1.3.E	Analyze and interpret data from fossils to provide evidence of the organisms and environments in which they lived long ago.	Environmentals and Survival
Natural Selection	3.1.3.F	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.	Inheritance and Traits
Adaptation	3.1.3.G	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	Inheritance and Traits
Biodiversity and Humans	3.1.3.H	Make a claim supported by evidence about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	Environments and Survival
Forces and Motion	3.2.3.A	Make and communicate observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Balancing Forces
	3.2.3.B	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Balancing Forces
	3.2.3.C	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	Balancing Forces
Types of Interactions	3.2.3.D	Define a simple design problem that can be solved by applying scientific ideas about magnets.	Balancing Forces

Grade 3

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Weather and Climate	3.3.3.A	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Weather and Climate
	3.3.3.B	Obtain and combine information to describe climates in different regions of the world.	Weather and Climate
Natural Hazards	3.3.3.C	Make a claim supported by evidence about the merit of a design solution that reduces the impacts of a weather-related hazard.	Weather and Climate

PENNSYLVANIA STEELS STANDARDS

Grade 4

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Structure and Function	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.	Vision and Light
Information Processing	3.1.4.B	Use a model to describe that animals receive different types of information through their senses, processes the information in their brain, and respond to the information in different ways.	Waves, Energy, and Information Vision and Light
Definitions of Energy	3.2.4.A	Use evidence to construct an explanation relating the speed of an object to the energy of that object.	Energy Conversions
Conservation of Energy and Energy Transfer	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 current.	Energy Conversions Waves, Energy, and Information
Relationship Between Energy and Forces	3.2.4.C	Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Energy Conversions Waves, Energy, and Information
Energy in Chemical Processes and Everyday Life	3.2.4.D	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	Energy Conversions
Wave Properties	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.	Waves, Energy, and Information
Electromagnetic Radiation	3.2.4.F	Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	Vision and Light
Information Technologies and Instrumentation	3.2.4.G	Generate and compare multiple solutions that use patterns to transfer information.	Waves, Energy, and Information
The History of Planet Earth	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.	Earth's Features
Earth Materials and Systems	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.	Earth's Features
Plate Tectonics and Large-Scale System Interactions	3.3.4.C	Analyze and interpret data from maps to describe patterns of Earth's features.	Earth's Features
Natural Resources	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.	Energy Conversions
Natural Hazards	3.3.4.E	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Energy Conversions Earth's Features

Grade 5

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Organization for Matter and Energy Flow in Organisms	3.1.5.A	Support an argument that plants get the materials they need for growth chiefly from air and water.	Ecosystem Restoration
Interdependent Relationships in Ecosystems	3.1.5.B	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	The Earth System Ecosystem Restoration
Structure and Properties of Matter	3.2.5.A	Develop a model to describe that matter is made of particles too small to be seen.	Modeling Matter The Earth System Ecosystem Restoration
	3.2.5.B	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.	Modeling Matter The Earth System
	3.2.5.C	Make and communicate observations and measurements to identify materials based on their properties.	Modeling Matter The Earth System
Chemical Reactions	3.2.5.D	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Modeling Matter The Earth System Ecosystem Restoration
	3.2.5.E	Interpret and analyze data to make decisions about how to utilize materials based on their properties.	Modeling Matter
Types of Interactions	3.2.5.F	Support an argument that the gravitational force exerted by Earth on objects is directed down.	Patterns of Earth and Sky
Energy in Chemical Processes and Everyday Life	3.2.5.G	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	Ecosystem Restoration
The Universe and Its Stars	3.3.5.A	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	Patterns of Earth and Sky
Earth and the Solar System	3.3.5.B	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Patterns of Earth and Sky
Earth Materials and Systems	3.3.5.C	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	The Earth System
The Roles of Water in Earth's Surface Processes	3.3.5.D	Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	The Earth System

PENNSYLVANIA STEELS STANDARDS

3-5 Environmental Literacy and Sustainability

Agricultural and Environmental Systems and Resources

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Agricultural Systems	3.4.K-2.A	Categorize ways people harvest, redistribute, and use natural resources.	Needs of Plants and Animals Energy Conversions (4) <i>Note: Amplify Science does not include activities in which students explicitly categorize the ways people harvest, redistribute, and use natural resources, but the topics themselves are covered in the above units.</i>
Environment and Society	3.4.K-2.B	Examine how people from different cultures and communities, including one's own, interact and express their beliefs about nature.	Sunlight and Weather

Environmental Literacy Skills

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Environmental Experiences	3.4K-2.C	Explain ways that places differ in their physical characteristics, their meaning, and their value and/or importance.	Changing Landforms Plant and Animal Relationships Earth's Features (4) <i>Note: This standard is most closely aligned to a 4th-grade unit but is implicitly explored in this grade band.</i>

Sustainability and Stewardship

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Environmental Sustainability	3.4K-2.D	Plan and carry out an investigation to address an issue in the local environment and community.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

3-5 Environmental Literacy and Sustainability

Agricultural and Environmental Systems and Resources

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Agricultural Systems	3.4.3-5.A	Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.	Environments and Survival Earth's Features Energy Conversions
Environment and Society	3.4.3-5.B	Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions.	Energy Conversions The Earth System Ecosystem Restoration <i>Note: Amplify Science does not directly address students' personal civic actions.</i>
Watersheds and Wetlands	3.4.3-5.C	Examine ways you influence your local environment and community by collecting and displaying data.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

Environmental Literacy Skills

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Investigating Environmental Issues	3.4.3-5.D	Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems.	The Earth System Ecosystem Restoration <i>Note: Amplify Science does not specifically focus on environmental issues that are local to Philadelphia, but many of the fictionalized contexts used throughout the program are localized.</i>
Evaluating Solutions	3.4.3-5.E	Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.	Weather and Climate Environments and Survival The Earth System Ecosystem Restoration <i>Note: While Amplify Science includes a large focus on proposing possible solutions for various environmental issues, it does not currently cover argumentation over whether or not action should be taken in the first place.</i>

PENNSYLVANIA STEELS STANDARDS

Sustainability and Stewardship

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Sustainability and Stewardship	3.4.3-5.F	Critique ways that people depend on and change the environment.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
Environmental Justice	3.4.3-5.G	Investigate how perspectives over the use of resources and the development of technology have changed over time and resulted in conflict over the development of societies and nations.	Environments and Survival Balancing Forces

3-5 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Applying, Maintaining, and Assessing Technological Products and Systems Impacts of Technology Influence of Society on Technological Development	3.5.3-5.A	Use appropriate symbols, numbers and words to communicate key ideas about technological products and systems.	Weather and Climate Energy Conversions Earth's Features Ecosystem Restoration
	3.5.3-5.B	Examine information to assess the trade-offs of using a product or system.	Energy Conversions
	3.5.3-5.C	Follow directions to complete a technological task.	<i>This standard is addressed implicitly throughout Amplify Science. For one example, see Lesson 4.3 in the unit Waves, Energy, and Information.</i>
	3.5.3-5.D	Predict how certain aspects of their daily lives would be different without given technologies.	Energy Conversions Waves, Energy, and Information Modeling Matter
	3.5.3-5.E	Explain why responsible use of technology requires sustainable management of resources.	Energy Conversions
	3.5.3-5.G	Describe the helpful and harmful effects of technology.	Energy Conversions Earth's Changing Climate (6–8) Earth's Changing Climate Engineering Internship (6–8) <i>Note: In Amplify Science, the harmful effects of technology are primarily explored in middle school.</i>
	3.5.3-5.H	Determine factors that influence changes in a society's technological systems or infrastructure.	Light Waves (6–8)
	3.5.3-5.I	Design solutions by safely using tools, materials, and skills.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration

PENNSYLVANIA STEELS STANDARDS

3-5 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Applying, Maintaining, and Assessing Technological Products and Systems Impacts of Technology Influence of Society on Technological Development	3.5.3-5.J	Explain how technologies are developed or adapted when individual or societal needs and wants change.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.K	Judge technologies to determine the best one to use to complete a given task or meet a need.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.L	Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.	Balancing Forces Environments and Survival
Design and Design Thinking in Technology and Engineering Education	3.5.3-5.M	Demonstrate essential skills of the engineering design process.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.N	Identify why a product or system is not working properly.	Energy Conversions
	3.5.3-5.O	Describe requirements of designing or making a product or system.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.P	Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Design and Design Thinking in Technology and Engineering Education	3.5.3-5.Q	Practice successful design skills.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.R	Apply tools, techniques, and materials in a safe manner as part of the design process.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.S	Illustrate that there are multiple approaches to design.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
			<i>Note: In accordance with the content of the NGSS, Amplify Science focuses on multiple solutions, rather than multiple design pathways.</i>
	3.5.3-5.I	Design solutions by safely using tools, materials, and skills.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.U	Evaluate designs based on criteria, constraints, and standards.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.V	Interpret how good design improves the human condition.	Energy Conversions The Earth System

PENNSYLVANIA STEELS STANDARDS

3-5 Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Integration of Knowledge, Technologies, and Practices	3.5.3-5.W	Describe the properties of different materials.	Properties of Materials (2) Modeling Matter The Earth System <i>Note: This standard most explicitly aligns to a 2nd-grade unit but is implicitly included in two 5th-grade units.</i>
	3.5.3-5.X	Explain how various relationships can exist between technology and engineering and other content areas.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.Y	Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.Z	Create a new product that improves someone's life.	Balancing Forces Weather and Climate Environments and Survival Energy Conversions The Earth System Ecosystem Restoration

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Nature and Characteristics of Technology and Engineering Core Concepts of Technology and Engineering History of Technology	3.5.3-5.AA	Create representations of the tools people made, how they cultivated to provide food, made clothing, and built shelters to protect themselves.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
	3.5.3-5.BB	Illustrate how, when parts of a system are missing, it may not work as planned.	Vision and Light Energy Conversions The Earth System Ecosystem Restoration
	3.5.3-5.CC	Describe how a subsystem is a system that operates as part of another larger system.	Microbiome (6–8) Metabolism (6–8) Traits and Reproduction (6–8)
	3.5.3-5.DD	Explain how solutions to problems are shaped by economic, political, and cultural forces.	Chemical Reactions (6–8)
	3.5.3-5.EE	Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used.	Balancing Forces Environments and Survival
	3.5.3-5.FF	Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.	Animal and Plant Defenses (1) Balancing Forces Environments and Survival
	3.5.3-5.GG	Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.	Weather and Climate Energy Conversions

PENNSYLVANIA STEELS STANDARDS

MS Life Sciences

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Structure and Function	3.1.6-8.A	Conduct an investigation to provide evidence that living things are made of cells, either one cell or many different numbers and types of cells.	Microbiome Metabolism Light Waves
	3.1.6-8.B	Develop and use a model to describe the function of a cell as a whole and the ways that parts of cells contribute to function.	Microbiome Metabolism Traits and Reproduction Matter and Energy in Ecosystems Light Waves
	3.1.6-8.C	Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	Microbiome Metabolism Traits and Reproduction
Growth and Development of Organisms	3.1.6-8.D	Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.	Traits and Reproduction
	3.1.6-8.E	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	Traits and Reproduction
Organization for Matter and Energy Flow in Organisms	3.1.6-8.F	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	Chemical Reactions Matter and Energy in Ecosystems Light Waves
	3.1.6-8.G	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organisms.	Metabolism Metabolism Engineering Internship Chemical Reactions Matter and Energy in Ecosystems Populations and Resources
Information Processing	3.1.6-8.H	Gather and synthesize information about how sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	Metabolism Light Waves
Interdependent Relationships in Ecosystems	3.1.6-8.I	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	Microbiome Earth's Changing Climate Populations and Resource
	3.1.6-8.J	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	Microbiome Populations and Resources Matter and Energy in Ecosystems

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Cycles of Matter and Energy Transfer in Ecosystems	3.1.6-8.K	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	Populations and Resources Matter and Energy in Ecosystems
Interdependent Relationships in Ecosystems	3.1.6-8.L	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	Earth's Changing Climate Populations and Resources Matter and Energy in Ecosystems Natural Selection
Inheritance of Traits	3.1.6-8.M	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organisms.	Traits and Reproduction Natural Selection Natural Selection Engineering Internship
Variation of Traits	3.1.6-8.N	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	Traits and Reproduction
Evidence of Common Ancestry and Diversity	3.1.6-8.O	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	Evolutionary History
	3.1.6-8.P	Apply scientific ideas to construct an explanation for anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	Evolutionary History
	3.1.6-8.Q	Analyze displays of pictorial data to compare patterns of similarities in anatomical structures across multiple species to identify relationships not evidence in the fully formed anatomy.	Evolutionary History
	3.1.6-8.R	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	Traits and Reproduction Natural Selection
Natural Selection	3.1.6-8.S	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	Natural Selection Natural Selection Engineering Internship
Adaptation	3.1.6-8.T	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	Natural Selection Natural Selection Engineering Internship
Biodiversity and Humans	3.1.6-8.U	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	Populations and Resources

PENNSYLVANIA STEELS STANDARDS

MS Physical Sciences

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Structure and Properties of Matter	3.2.6-8.A	Develop models to describe the atomic composition of simple molecules and extended structures.	Thermal Energy Phase Change Chemical Reactions Matter and Energy in Ecosystems
	3.2.6-8.B	Develop a model that predicts and describes changes in the particle motion, temperature and state of a pure substance when thermal energy is added or removed.	Weather Patterns Thermal Energy Phase Change Phase Change Engineering Internship
	3.2.6-8.C	Gather and make sense of information to describe how synthetic materials come from natural resources and impact society.	Chemical Reactions
Chemical Reactions	3.2.6-8.D	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	Chemical Reactions
	3.2.6-8.E	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	Chemical Reactions
	3.2.6-8.F	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	Chemical Reactions Matter and Energy in Ecosystems
Forces and Motion	3.2.6-8.G	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	Force and Motion Engineering Internship
	3.2.6-8.H	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Force and Motion
Types of Interactions	3.2.6-8.I	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	Magnetic Fields
	3.2.6-8.J	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	Force and Motion Force and Motion Engineering Internship Earth, Moon, and Sun
	3.2.6-8.K	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	Magnetic Fields
Definitions of Energy	3.2.6-8.L	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass and speed of an object.	Harnessing Human Energy Force and Motion Magnetic Fields

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Conservation of Energy and Energy Transfer	3.2.6-8.M	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*	Ocean, Atmosphere, and Climate Weather Patterns Thermal Energy Phase Change Engineering Internship
	3.2.6-8.N	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in average kinetic energy of the particles as measured by the temperature of the sample.	Thermal Energy Phase Change Phase Change Engineering Internship
	3.2.6-8.O	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	Thermal Energy Harnessing Human Energy Phase Change Magnetic Fields
Relationship Between Energy and Forces	3.2.6-8.P	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.	Harnessing Human Energy Magnetic Fields
Wave Properties	3.2.6-8.Q	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	Ocean, Atmosphere, and Climate Light Waves
Electromagnetic Radiation	3.2.6-8.R	Develop and use a model to describe how waves are reflected, absorbed, or transmitted through various materials.	Earth's Changing Climate Engineering Internship Light Waves
Information Technologies and Instrumentation	3.2.6-8.S	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.	Light Waves

PENNSYLVANIA STEELS STANDARDS

MS Earth and Space Science

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
The Universe and Its Stars	3.3.6-8.A	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.	Earth, Moon, and Sun
	3.3.6-8.B	Develop and use a model to describe the role of gravity in the motion within galaxies and the solar system.	Earth, Moon, and Sun
Earth and the Solar System	3.3.6-8.C	Analyze and interpret data to determine scale properties of objects in the solar system.	Geology on Mars Rock Transformations Phase Change Earth, Moon, and Sun
The History of Planet Earth	3.3.6-8.D	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	Plate Motion
Earth Materials and Systems	3.3.6-8.E	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	Geology on Mars Plate Motion Plate Motion Engineering Internship Rock Transformations
	3.3.6-8.F	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	Weather Patterns Rock Transformations Matter and Energy in Ecosystems
Plate Tectonics and Large-Scale System Interactions	3.3.6-8.G	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motion.	Ocean, Atmosphere, and Climate Plate Motion Plate Motion Engineering Internship Rock Transformations
The Roles of Water in Earth's Surface Processes	3.3.6-8.H	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	Weather Patterns Phase Change
	3.3.6-8.I	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	Ocean, Atmosphere, and Climate Weather Patterns

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Weather and Climate	3.3.6-8.J	Collect data to provide evidence for how the motion and complex interactions of air masses result in changes in weather conditions.	Ocean, Atmosphere, and Climate Weather Patterns
	3.3.6-8.K	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	Earth's Changing Climate Earth's Changing Climate Engineering Internship Chemical Reactions Light Waves Matter and Energy in Ecosystems
Natural Resources	3.3.6-8.L	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	Rock Transformations Chemical Reactions Harnessing Human Energy
Natural Hazards	3.3.6-8.M	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	Ocean, Atmosphere, and Climate Weather Patterns Earth's Changing Climate Earth's Changing Climate Engineering Internship
Human Impact on Earth Systems	3.3.6-8.N	Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.	Earth's Changing Climate Earth's Changing Climate Engineering Internship Chemical Reactions Populations and Resources
	3.3.6-8.O	Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems.	Earth's Changing Climate

PENNSYLVANIA STEELS STANDARDS

MS Environmental Literacy and Sustainability

Agricultural and Environmental Systems and Resources

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Agricultural Systems	3.4.6-8.A	Develop a model to describe how agricultural and food systems function, including the sustainable use of natural resources and the production, processing, and management of food, fiber, and energy.	Earth's Changing Climate <i>Note: Because this standard is not reflected in the NGSS, Amplify Science does not include an explicit focus on agricultural systems. The aligned unit does, however, discuss the sustainable use of natural resources in various technological systems.</i>
Environment and Society	3.4.6-8.B	Analyze and interpret data about how different societies (economic and social systems) and cultures use and manage natural resources differently.	The Earth System (5) Ecosystem Restoration (5)
Water and Wetlands	3.4.6-8.C	Develop a model to describe how watersheds and wetlands function as systems, including the roles and functions they serve.	Populations and Resources Matter and Energy in the Ecosystem Ecosystem Restoration (5) <i>Note: Wetlands are not explicitly addressed in middle school units, but the book Restoration Case Studies from the Ecosystem Restoration unit (5) explores wetlands directly.</i>

Environmental Literacy Skills

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Environmental Experiences	3.4.6-8.D	Collect, analyze, and interpret environmental data to describe a local environment.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
Evaluating Solutions	3.4.6-8.E	Obtain and communicate information on how integrated pest management could improve indoor and outdoor environments.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
Investigating Environmental Issues	3.4.6-8.F	Gather, read, and synthesize information from multiple sources to investigate how Pennsylvania environmental issues affect Pennsylvania's human and natural systems.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

Environmental Literacy Skills

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Evaluating Solutions	3.4.6-8.E	Obtain and communicate information on how integrated pest management could improve indoor and outdoor environments.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
Investigating Environmental Issues	3.4.6-8.F	Gather, read, and synthesize information from multiple sources to investigate how Pennsylvania environmental issues affect Pennsylvania's human and natural systems.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

Sustainability and Stewardship

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Environmental Sustainability	3.4.6-8.G	Obtain and communicate information to describe how best management practices and environmental laws are designed to achieve environmental sustainability.	Earth's Changing Climate Earth's Changing Climate Engineering Internship <i>Note: There is no focus on environmental laws in Amplify Science.</i>
Environmental Stewardship	3.4.6-8.H	Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.	Earth's Changing Climate Earth's Changing Climate Engineering Internship
Environmental Justice	3.4.6-8.I	Construct an explanation that describes regional environmental conditions and their implications on environmental justice and social equity.	Earth's Changing Climate Earth's Changing Climate Engineering Internship The Earth System (5) <i>Note: The connections between environmental justice and social equity is most explicit in The Earth System unit (5).</i>

MS Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Applying, Maintaining, and Assessing Technological Products and Systems Impacts of Technology Influence of Society on Technological Development	3.5.6-8.A	Research information from various sources to use and maintain technological products or systems.	All Engineering Internship units <i>Note: Amplify Science has no focus on maintaining products or systems.</i>
	3.5.6-8.B	Use instruments to gather data on the performance of everyday products. <i>N.B. The definition of "instruments" is unclear; Amplify primarily uses digital instruments via their sims.</i>	All Engineering Internship units
	3.5.6-8.C	Hypothesize what alternative outcomes (individual, cultural, and/or environmental) might have resulted had a different technological solution been selected.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
	3.5.6-8.D	Analyze how the creation and use of technologies consumes renewable, non-renewable, and inexhaustible resources; creates waste; and may contribute to environmental challenges.	Rock Transformations Chemical Reactions Harnessing human Energy Earth's Changing Climate Engineering Internship
	3.5.6-8.E	Consider the impacts of a proposed or existing technology and devise strategies for reducing, reusing, and recycling waste caused by its creation.	Populations and Resources
	3.5.6-8.F	Analyze examples of technologies that have changed the way people think, interact, live, and communicate.	Light Waves
	3.5.6-8.G	Analyze how an invention or innovation was influenced by the context and circumstances in which it is developed.	Light Waves
	3.5.6-8.H	Evaluate trade-offs based on various perspectives as part of a decision process that recognizes the need for careful compromises among competing factors.	All Engineering Internship units
	3.5.6-8.I	Examine the ways that technology can have both positive and negative effects at the same time.	All Engineering Internship units
	3.5.6-8.J	Use tools, materials, and machines to safely diagnose, adjust, and repair systems.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
	3.5.6-8.K	Use devices to control technological systems.	All Engineering Internship units
	3.5.6-8.L	Design methods to gather data about technological systems.	All Engineering Internship units
	3.5.6-8.M	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	All Engineering Internship units
	3.5.6-8.N	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	All Engineering Internship units

Environmental Literacy Skills

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Design and Design Thinking in Technology and Engineering Education	3.5.6-8.O	Interpret the accuracy of information collected.	All Engineering Internship units
	3.5.6-8.P	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	All Engineering Internship units
	3.5.6-8.Q	Apply a technology and engineering design thinking process.	All Engineering Internship units
	3.5.6-8.R	Develop innovative products and systems that solve problems and extend capabilities based on individual or collective needs and wants.	All Engineering Internship units
	3.5.6-8.S	Illustrate the benefits and opportunities associated with different approaches to design.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
	3.5.6-8.T	Create solutions to problems by identifying and applying human factors in design.	All Engineering Internship units
	3.5.6-8.U	Evaluate and assess the strengths and weaknesses of various design solutions given established principles and elements of design.	All Engineering Internship units
	3.5.6-8.V	Refine design solutions to address criteria and constraints.	All Engineering Internship units
	3.5.6-8.W	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	All Engineering Internship units Harnessing Human Energy
Integration of Knowledge, Technologies, and Practices	3.5.6-8.X	Defend decisions related to a design problem.	All Engineering Internship units
	3.5.6-8.Y	Compare, contrast, and identify overlap between the contributions of science, technology, engineering, and mathematics in the development of technological systems.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>
	3.5.6-8.Z	Analyze how different technological systems often interact with economic, environmental, and social systems.	Earth's Changing Climate Earth's Changing Climate Engineering Internship
	3.5.6-8.AA	Adapt and apply an existing product, system, or process to solve a problem in a different setting.	All Engineering Internship units
	3.5.6-8.BB	Demonstrate how knowledge gained from other content areas affects the development of technological products and systems.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

PENNSYLVANIA STEELS STANDARDS

MS Technology and Engineering

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Nature and Characteristics of Technology and Engineering Core Concepts of Technology and Engineering History of Technology	3.5.6-8.CC	Consider historical factors that have contributed to the development of technologies and human progress.	All Engineering Internship units
	3.5.6-8.DD	Engage in a research and development process to simulate how inventions and innovations have evolved through systematic tests and refinements.	All Engineering Internship units
	3.5.6-8.EE	Differentiate between inputs, processes, outputs, and feedback in technological systems.	Weather Patterns Rock Formations Matter and Energy in Ecosystems Earth's Changing Climate Earth's Changing Climate Engineering Internship
	3.5.6-8.FF	Demonstrate how systems thinking involves considering relationships between every part, as well as how the systems interact with the environment in which it is used.	Weather Patterns Rock Formations Matter and Energy in Ecosystems Earth's Changing Climate Earth's Changing Climate Engineering Internship
	3.5.6-8.GG	Create an open-loop system that has no feedback path and requires human intervention.	Weather Patterns Rock Formations Matter and Energy in Ecosystems Earth's Changing Climate Earth's Changing Climate Engineering Internship <i>Note: This standard primarily aligns with high school NGSS standards. The best fit Amplify Science units have been suggested, but the connection between open-loop and closed-loop feedback systems and human intervention is not explicitly covered.</i>

STRAND	CODE	STANDARD	AMPLIFY SCIENCE UNITS(S)
Nature and Characteristics of Technology and Engineering Core Concepts of Technology and Engineering History of Technology	3.5.6-8.HH	Create a closed-loop system that has a feedback path and requires no human intervention.	Weather Patterns Rock Formations Matter and Energy in Ecosystems Earth's Changing Climate Earth's Changing Climate Engineering Internship <i>Note: This standard primarily aligns with high school NGSS standards. The best fit Amplify Science units have been suggested, but the connection between open-loop and closed-loop feedback systems and human intervention is not explicitly covered.</i>
	3.5.6-8.II	Predict outcomes of a future product or system at the beginning of the design process	All Engineering Internship units
	3.5.6-8.JJ	Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.	All Engineering Internship units
	3.5.6-8.KK	Explain how technology and engineering are closely linked to creativity, which can result in both intended and unintended innovations.	Microbiome Metabolism Traits and Reproduction
	3.5.6-8.LL	Compare how different technologies involve different sets of processes.	<i>Because Amplify Science was written for the NGSS, which do not include this standard, this content is not currently addressed in the Amplify Science program.</i>

