PLTW Launch Modules Overview

Pennsylvania

This curriculum guide provides standards connections for the PA STEELS.

Each PLTW Launch Module integrates science performance expectations (PEs) with science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs), while focusing on engineering, computer science, or one of the three areas of science outlined in the STEELS:

- Life Science
- Physical Science
- Earth and Space Science

More information can be found in the *Teacher's Guide*, including module specific standards connections for ELA and Math and the Curriculum Framework. The framework offers a big-picture view of the module that includes the desired results of student learning, an overview of the module's scaffolded approach to learning, and assessment opportunities found in each activity, project, and problem.

PLTW COMPUTER SCIENCE

PLTW ENGINEERING

Please note: The information included in this document is subject to change. As with all course materials, we will continue to update as more information becomes available.

PLTW

LAUNCH PA STEELS K-5 Overview

	Life Science			Physical Science		Earth and Space Science		Engineering		Computer Science
K	Living Things: Needs and Impacts			Pushes and Pulls		Sunlight and Weather		Structure and Function: Exploring Design	Structure and Function: Human Body	Animals and Algorithms
1	Animal Adaptations	Designs Inspired by Nature		Light and Sound		Light: Observing the Sun, Moon, and Stars				Animated Storytelling
2	Living Things: Diversity of Life	Materials Science: Form and Function		Materials Science: Properties of Matter		The Changing Earth				Grids and Games
3	Life Cycles and Survival	Variation of Traits	Environmental Changes	Stability and Motion: Forces and Interactions	Stability and Motion: Science of Flight	Weather: Factors and Hazards				Programming Patterns
4	Organisms: Structure and Function		Input/Output: Human Brain	Energy Exploration	Waves and the Properties of Light	Earth: Past, Present, and Future	Earth: Human Impact and Natural Disasters			Input/Output: Computer Systems
5	Ecosystems: Flow of Matter and Energy			Matter: Properties and Reactions		Patterns in the Universe	Earth's Water and interconnected Systems	Robotics and Automation Infection: Detection		Robotics and Automation: Challenge Infection: Modeling and Simulation

PLTW LAUNCH
Kindergarten STEELS

	Essential Questions	Science	Environmental Literacy and Sustainability	Technology and Engineering ★ Alignments for all modules noted in green			
				Technology ★ 3-5.K-2.K, L	Design ★ 3.5.K-2.M→Q 3.5.K-2.S, T	Integration of Knowledge, Technology, and Practices ★ 3.5.K-2.V→X	Nature, Characteristics, Core Concepts and History ★ 3.5.K-2.AA 3.5.K-2.CC, DD
Living Things: Needs and Impacts	How can plants and animals impact their natural environment to meet their needs? How can humans lessen their negative impact on the natural environment? How can a step-by-step process help you design or improve a solution to a problem?	3.1.K.A 3.3.K.B 3.3.K.C 3.3.K.E	3.4.K-2.A 3.4.K-2.B 3.4.K-2.D	★ 3.5.K-2.D	★	★	★ 3.5.K-2.Z 3.5.K-2.BB
Pushes and Pulls	In what ways do forces impact your daily life? How are pushes and pulls related? How can a step-by-step process help you design or improve a solution to a problem?	3.2.K.A 3.2.K.B		★	★	★	★
Sunlight and Weather	How does the Sun affect Earth? How does weather affect our lives? How can a step-by-step process help you design or improve a solution to a problem?	3.2.K.C 3.2.K.D 3.3.K.A 3.3.K.D		★ 3.5.K-2.A→G	★ 3.5.K-2.R	★	★
Animals and Algorithms	How do you use algorithms in your daily life? How can you use programming to complete a task? How can a step-by-step process help you design or improve a solution to a problem?	3.3.K.C		★ 3.5.K-2.F, G 3.5.K-2.I, J	★ 3.5.K-2.R	★	★
Structure and Function: Exploring Design	How do materials impact the structure and function of an object? How does the structure of an object impact its function? How can a step-by-step process help you design or improve a solution to a problem?			★ 3.5.K-2.B 3.5.K-2.H	★	★	★ 3.5.K-2.BB
Structure and Function: Human Body	How are structure and function related? How would we function if our bodies were structured differently? How can a step-by-step process help you design or improve a solution to a problem?			★ 3.5.K-2.E→H	★ 3.5.K-2.U	★	★ 3.5.K-2.Z

PLTW LAUNCH

1st Grade STEELS

	Essential Questions	Science	Environmental Literacy and Sustainability	Technology and Engineering ★ Alignments for all modules noted in green			
				Technology ★ 3-5.K-2.K, L	Design ★ 3.5.K-2.M→Q 3.5.K-2.S, T	Integration of Knowledge, Technology, and Practices ★ 3.5.K-2.V→X	Nature, Characteristics, Core Concepts and History ★ 3.5.K-2.AA 3.5.K-2.CC, DD
Animal Adaptations	How do plants and animals adapt to their environments? How can nature inspire solutions to human problems? How can a step-by-step process help you design or improve a solution to a problem?	3.1.1.A	3.4.K-2.C	★ 3.5.K-2.B, C 3.5.K-2.F, G 3.5.K-2.I, J	★ 3.5.K-2.R	★	★ 3.5.K-2.Z 3.5.K-2.BB
Designs Inspired by Nature	Why do animals communicate as they do? How can nature inspire solutions to human problems? How can a step-by-step process help you design or improve a solution to a problem?	3.1.1.A 3.1.1.B 3.1.1.C		★ 3.5.K-2.A→C 3.5.K-2.E 3.5.K-2.G, H 3.5.K-2.J	★ 3.5.K-2.R 3.5.K-2.U	★	★ 3.5.K-2.Y 3.5.K-2.BB
Light and Sound	How do light and sound affect your life? Why is understanding cause and effect important to your life? How can collaboration help you solve problems?	3.2.1.A 3.2.1.B 3.2.1.C 3.2.1.D		★ 3.5.K-2.B, C 3.5.K-2.E→H 3.5.K-2.J	★	★	★
Light: Observing the Sun, Moon, and Stars	How does the Sun affect your life? Why is understanding cause and effect important to your life? What is the relationship between patterns and natural phenomena?	3.3.1.A 3.3.1.B		★ 3.5.K-2.C→G 3.5.K-2.I	★	★	★ 3.5.K-2.Y 3.5.K-2.BB
Animated Storytelling	In what ways can stories be told using different tools? How does technology impact our lives? How can collaboration help you design or improve a solution to a problem?		3.4.K-2.D	★ 3.5.K-2.A 3.5.K-2.F	★ 3.5.K-2.R	★	★

PLTW LAUNCH
2nd Grade STEELS

		Essential Questions	Science	Environmental Literacy and Sustainability	Technology and Engineering ★ Alignments for all modules noted in green			
					Technology ★ 3-5.K-2.K, L	Design ★ 3.5.K-2.M→Q 3.5.K-2.S, T	Integration of Knowledge, Technology, and Practices ★ 3.5.K-2.V→X	Nature, Characteristics, Core Concepts and History ★ 3.5.K-2.AA 3.5.K-2.CC, DD
	Living Things: Diversity of Life	How do scientists learn about the world? How do diverse habitats meet the needs of organisms? How can a step-by-step process help you design or improve a solution to a problem?	3.1.2.A 3.1.2.C	3.4.K-2.D	★ 3.5.K-2.B 3.5.K-2.G 3.5.K-2.I	★ 3.5.K-2.U	★	★ 3.5.K-2.Z 3.5.K-2.BB
	Materials Science: Form and Function	How does the function of an object influence its form? How does nature influence design? How can a step-by-step process help you design or improve a solution to a problem?	3.1.2.B 3.2.2.B 3.2.2.C		★ 3.5.K-2.B, C 3.5.K-2.F, G 3.5.K-2.I, J	★ 3.5.K-2.R	★ 3.5.K-2.V	★ 3.5.K-2.Y 3.5.K-2.BB
	Materials Science: Properties of Matter	What properties of materials do you need to consider when designing a product? How can we identify when something is (or is not) a solution to a problem?	3.2.2.A 3.2.2.B 3.2.2.C 3.2.2.D		★ 3.5.K-2.A→C 3.5.K-2.F, G 3.5.K-2.J	★ 3.5.K-2.R	★ 3.5.K-2.V	★ 3.5.K-2.Y 3.5.K-2.BB
	The Changing Earth	How can something appear stable when it is actually changing? How are system models used to predict and understand real world situations or scientific phenomena? How can a step-by-step process help you design or improve a solution to a problem?	3.3.2.A 3.3.2.B 3.3.2.C 3.3.2.D	3.4.K-2.D	★ 3.5.K-2.A 3.5.K-2.E→G	★ 3.5.K-2.R	★ 3.5.K-2.V	★
	Grids and Games	How can learning from others help you design or improve a solution to a problem? In what ways can computer science impact our lives?			★ 3.5.K-2.A 3.5.K-2.J	★ 3.5.K-2.R	★	★ 3.5.K-2.Y

PLTW LAUNCH

3rd Grade STEELS

		Essential Questions	Science	Environmental Literacy and Sustainability	Technology and Engineering ★ Alignments for all modules noted in green			
					Technology ★ 3-5.3-5. C, I	Design ★ 3.5.3-5.M→U	Integration of Knowledge, Technology, and Practices	Nature, Characteristics, Core Concepts and History
	Life Cycles and Survival	Why are life cycles of organisms important for life on Earth? How do bees impact our world? How can a step-by-step process help you design or improve a solution to a problem?	3.1.3.A 3.1.3.B	3.4.3-5.A 3.4.3-5.B 3.4.3-5.C 3.4.3-5.E	★ 3.5.3-5.K	★		3.5.3-5.BB 3.5.3-5.EE 3.5.3-5.FF
	Variation of Traits	Why do some offspring look like their parents while others do not? How are traits of one generation passed to the next? How can a step-by-step process help you design or improve a solution to a problem?	3.1.3.C 3.1.3.D 3.1.3.F		★	★		3.5.3-5.GG 3.5.3-5.HH
	Environmental Changes	How does an animal's habitat affect its survival? How do environmental changes affect organisms? How can a step-by-step process help you design or improve a solution to a problem?	3.1.3.E 3.1.3.G 3.1.3.H	3.4.3-5.A 3.4.3-5.D 3.4.3-5.E	★ 3.5.3-5.K	★		3.5.3-5.BB
	Stability and Motion: Forces and Interactions	In what ways do forces impact your daily life? How do machines make life easier? How can a step-by-step process help you design or improve a solution to a problem?	3.2.3.A 3.2.3.B 3.2.3.C 3.2.3.D		★ 3.5.3-5.A 3.5.3-5.D 3.5.3-5.G 3.5.3-5.L	★ 3.5.3-5.V	3.5.3-5.Z	3.5.3-5.CC 3.5.3-5.DD 3.5.3-5.GG 3.5.3-5.HH
	Stability and Motion: Science of Flight	In what ways do forces impact our world? How do balanced and unbalanced forces affect aircraft flight? How can a step-by-step process help you design or improve a solution to a problem?	3.2.3.A 3.2.3.B		★ 3.5.3-5.A	★	3.5.3-5.W 3.5.3-5.Z	3.5.3-5.GG 3.5.3-5.HH
	Weather: Factors and Hazards	How does weather affect our lives? How can a step-by-step process help you design or improve a solution to a problem?	3.3.3.A 3.3.3.B 3.3.3.C	3.4.3-5.A 3.4.3-5.C 3.4.3-5.D 3.4.3-5.E 3.4.3-5.F	★ 3.5.3-5.A 3.5.3-5.G 3.5.3-5.K	★	3.5.3-5.W 3.5.3-5.Z	3.5.3-5.AA 3.5.3-5.GG 3.5.3-5.HH
	Programming Patterns	How does technology impact our lives? How can a step-by-step process help you design or improve a solution to a problem?			★ 3.5.3-5.A 3.5.3-5.L	★		3.5.3-5.BB 3.5.3-5.DD 3.5.3-5.HH

PLTW LAUNCH 4th Grade STEELS

		Essential Questions	Science	Environmental Literacy and Sustainability	Technology and Engineering ★ Alignments for all modules noted in green			
					Technology ★ 3-5.3-5. C, I	Design ★ 3.5.3-5.M→U	Integration of Knowledge, Technology, and Practices	Nature, Characteristics, Core Concepts and History
	Organisms: Structure and Function	How are organisms structured to support and sustain life? How do scientists and engineers understand the world around them? How can a step-by-step process help you design or improve a solution to a problem?	3.1.4.A 3.1.4.B		★	★	3.5.3-5.Z	3.5.3-5.BB 3.5.3-5.CC 3.5.3-5.FF 3.5.3-5.HH
	Input/Output: Human Brain	How does your body sense input from the outside world and make an appropriate response? How do medical professionals use cause and effect relationships to diagnose a brain injury? How can a step-by-step process help you design or improve a solution to a problem?	3.1.4.A		★	★		3.5.3-5.BB 3.5.3-5.CC 3.5.3-5.FF 3.5.3-5.HH
	Energy Exploration	Why is energy necessary? How does energy transfer affect your life? How can a step-by-step process help you construct an explanation or design a solution to a problem?	3.2.4.A 3.2.4.B 3.2.4.C 3.2.4.D	3.4.3-5.A 3.4.3-5.B	★ 3.5.3-5.A 3.5.3-5.F→H 3.5.3-5.J	★ 3.5.3-5.V	3.5.3-5.Z	3.5.3-5.AA 3.5.3-5.HH
	Waves and the Properties of Light	How are waves used to predict results and solve problems? How do the properties of light allow us to see? How can we use patterns to make sense of the world? How can a step-by-step process help you design or improve a solution to a problem?	3.2.4.E 3.2.4.F		★ 3.5.3-5.A 3.5.3-5.K	★	3.5.3-5.W	3.5.3-5.DD 3.5.3-5.GG
	Input/Output: Computer Systems <>	How does technology impact our lives? In what ways do computing systems work together to accomplish tasks? How can a step-by-step process help you design or improve a solution to a problem?	3.2.4.G		★ 3.5.3-5.A 3.5.3-5.G 3.5.3-5.K 3.5.3-5.L	★	3.5.3-5.X 3.5.3-5.Y	3.5.3-5.DD 3.5.3-5.HH
	Earth: Past, Present, and Future	How has Earth changed over time? Why is Earth constantly changing? How can a step-by-step process help you design or improve a solution to a problem?	3.3.4.A 3.3.4.B 3.3.4.C	3.4.3-5.A	★ 3.5.3-5.K	★		3.5.3-5.HH
	Earth: Human Impact and Natural Disasters	In what ways do human interactions impact Earth? How do natural hazards impact Earth? How can a step-by-step process help you design or improve a solution to a problem?	3.3.4.D 3.3.4.E	3.4.3-5.A→D 3.4.3-5.F, G	★ 3.4.3-5.A 3.4.3-5.F 3.4.3-5.J	★ 3.4.3-5.V		

PLTW LAUNCH 5th Grade STEELS

		Essential Questions	Science	Environmental Literacy and Sustainability	Technology and Engineering ★ Alignments for all modules noted in green			
					Technology ★ 3-5.3-5. C, I	Design ★ 3.5.3-5.M→U	Integration of Knowledge, Technology, and Practices	Nature, Characteristics, Core Concepts and History
	Ecosystems: Flow of Matter and Energy	How do matter and energy flow through an ecosystem? How does a change in an ecosystem affect its balance? How can a step-by-step process help you design or improve a solution to a problem?	3.1.5.A 3.1.5.G	3.4.3-5.A 3.4.3-5.B 3.4.3-5.E 3.4.3-5.F	★	★		3.5.3-5.CC
	Matter: Properties and Reactions	How do the structures and properties of matter help us solve real-world problems? How do mechanical properties impact engineering design? How can a step-by-step process help you design or improve a solution to a problem?	3.2.5.A 3.2.5.B 3.2.5.C 3.2.5.D 3.2.5.E		★ 3.5.3-5.A 3.5.3-5.K	★	3.5.3-5.W	3.5.3-5.EE 3.5.3-5.GG 3.5.3-5.HH
	Patterns in the Universe	What is Earth's place in the universe? How do the predictable patterns of Earth impact our lives? How can a step-by-step process help you design or improve a solution to a problem?	3.3.5.A 3.3.5.B		★	★		3.5.3-5.HH
	Earth's Water and Interconnected Systems	How do Earth's major systems interact? Is there enough fresh water on Earth? How can a step-by-step process help you design or improve a solution to a problem?	3.2.5.C 3.2.5.D 3.2.5.F	3.4.3-5.A 3.4.3-5.D→F	★ 3.5.3-5.A 3.5.3-5.G 3.5.3-5.J 3.5.3-5.K	★	3.5.3-5.Z	3.5.3-5.BB 3.5.3-5.CC 3.5.3-5.HH
	Robotics and Automation	How can automation and robotics be used to protect the Earth's resources and environment? How can the engineering design process be applied in daily life?			★ 3.5.3-5.A, B 3.5.3-5.G 3.5.3-5.J 3.5.3-5.L	★ 3.5.3-5.V	3.5.3-5.X 3.5.3-5.Z	3.5.3-5.CC→EE 3.5.3-5.GG, HH
	Robotics and Automation: Challenge	How can autonomous robots be used to help people? How can a step-by-step process help you design or improve a solution to a problem?			★ 3.5.3-5.A 3.5.3-5.G 3.5.3-5.J 3.5.3-5.L	★ 3.5.3-5.V	3.5.3-5.X 3.5.3-5.Z	3.5.3-5.BB 3.5.3-5.FF 3.5.3-5.HH
	Infection: Detection	How can germs be spread from person to person? How do medical professionals use cause and effect relationships to diagnose illnesses? How can a step-by-step process help you design or improve a solution to a problem?		3.4.3-5.A 3.4.3-5.C 3.4.3-5.D	★	★		3.5.3-5.BB 3.5.3-5.HH
	Infection: Modeling and Simulation	How do computer models and simulations help us to make sense of scientific phenomena? In what ways can computer models and simulations be used to predict outcomes? How can a step-by-step process help you design or improve a solution to a problem?		3.4.3-5.A 3.4.3-5.C 3.4.3-5.D	★	★		3.5.3-5.BB 3.5.3-5.HH