PLTW Launch Modules Overview K-5
TN Academic Standards for Science

This curriculum guide provides standards connections for the following bodies of standards:

1. **Tennessee Academic Standards for Science**
2. **Common Core State Standards-ELA (CCSS)**
3. **Common Core State Standards-Math (CCSS)**
4. **Tennessee Computer Science State Standards**

Each PLTW Launch Module integrates ELA and Math into learning while focusing on engineering, computer science, or one of the three areas of science:

- **Physical Science**
- **Life Science**
- **Earth and Space Science**

PLTW Launch Modules have been thoughtfully connected to science standards for Tennessee educators. Each grade level has been connected to the PLTW Launch Modules that are the "best-fit" for the Tennessee Academic Standards for Science. When grade level suggestions vary from the intended grade level it is shown like this: *Variation of Traits (3)* to indicate that the module was originally developed for use in 3rd Grade.

Tennessee educators also have the flexibility to utilize the PLTW Launch Modules in the grade level that works best for their students.

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 K-5 Tennessee Science

	Physical Science		Life Science			Earth and Space Science	
K	Structure and Function: Exploring Design K.PS1.1	Matter: Floating and Sinking (PK) K.PS1.2	Life Science: Living and Nonliving Things (PK) K.LS1.1, K.LS1.2, K.LS1.3			Sunlight and Weather K.ESS2.1, K.ESS2.2, K.ESS3.2	Living Things: Needs and Impacts K.ESS3.1, K.ESS3.3
1	Light and Sound 1.PS4.1, 1.PS4.2		Designs Inspired by Nature 1.LS1.1			Light: Observing the Sun, Moon, and Stars 1.ESS1.1, 1.ESS1.2, 1.ESS1.3	
2			Animal Adaptations (1) 2.LS1.1	Living Things: Diversity of LIfe 2.LS2.1	Variation of Traits (3) 2.LS3.1	The Changing Earth 2.ESS2.1, 2.ESS2.2, 2.ESS2.3, 2.ESS2.4	
3	Materials Science: Properties of Matter (2) 3.PS1.1, 3.PS1.2, 3.PS1.3	Stability and Motion: Forces and Interactions 3.PS2.1, 3.PS2.2, 3PS.3.3	Environmental Changes 3.LS4.1, 3.LS4.2	Life Cycles and Survival 3.LS4.3		Weather: Factors and Hazards 3.ESS2.3, 3.ESS2.4, 3.ESS3.1, 3.ESS3.2	
4	Energy Exploration 4.PS3.1, 4.PS3.2, 4.PS3.3	Waves and the Properties of Light 4.PS4.1, 4.PS4.2	Ecosystems: Flow of Matter and Energy (5) 4.LS2.1, 4.LS2.2, 4.LS2.3, 4.LS2.4, 4.LS2.5	Organisms: Structure and Function 4.LS4.1		Earth: Past, Present, and Future 4.ESS1.1, 4.ESS2.1, 4.ESS2.2, 4.ESS2.3, 4.ESS2.4	Earth: Human Impact and Natural Disasters 4.ESS3.1
5	Matter: Properties and Reactions 5.PS1.1, 5.PS1.2, 5.PS1.4	Earth's Water and Interconnected Systems 5.PS2.3, 5.PS2.5				Patterns in the Universe 5.ESS1.1, 5.ESS1.2, 5.ESS1.3, 5.ESS1.4, 5.ESS1.5, 5.ESS1.6, 5.ESS1.7	

PLTW LAUNCH Kindergarten

	Essential Questions	Science Standards	Engineering Standards	CCSS ELA	CCSS Math	Computer Science
Structure and Function: Exploring Design	How can a step-by-step process help you design or improve a solution to a problem? How do materials impact the structure and function of an object? How does the structure of an object impact its function?	K.PS1.1	K.ETS1.1 K.ETS1.2 K.ETS2.1	RL.K.1 RL.K.2 RL.K.3 SL.K.1.a SL.K.1.b	K.CC.A.3 → 5 K.MD.A.2 K.G.A.2 Math Practices 1-5	K.FC.2 K.NI.1
Matter: Floating and Sinking (PK)	Why do some objects float and other sink? How can patterns be used to predict results and solve problems? How can a step-by-step process help you design or improve a solution to a problem?	K.PS1.2	K.ETS1.1 K.ETS1.2 K.ETS2.1			K.FC.2 K.NI.1
Life Science: Living and Nonliving Things (PK)	How can living things survive when their environment changes? How can a step-by-step process help you design or improve a solution to a problem? How does your model relate to the real world?	K.LS1.1 K.LS1.2 K.LS1.3	K.ETS1.1 K.ETS1.2 K.ETS2.1			K.FC.2 K.NI.1
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?	K.ESS2.1 K.ESS2.2 K.ESS3.2	K.ETS1.1 K.ETS1.2 K.ETS2.1	RL.K.1 RL.K.3 RL.K.10 RI.K.1 RI.K.2 RI.K.10	K.CC.A.3 K.MD.A.2 Math Practices 1-3	K.FC.2 K.DA.1 K.NI.1
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?	K.ESS3.1 K.ESS3.3	K.ETS1.1 K.ETS1.2 K.ETS2.1	RL.K.3 RI.K.1 RI.K.2 W.K.2 W.K.7 SL.K.1 SL.K.2 SL.K.4 SL.K.5	K.CC.A.1 K.CC.A.3 K.CC.B.5 K.MD.B.3 Math Practices 1, 3	K.FC.2 K.NI.1
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?		K.ETS1.1 K.ETS1.2 K.ETS2.1	W.K.2 SL.K.3 SL.K.4 SL.K.5	K.CC.A.3 K.MD.A.2 K.MD.B.3 Math Practices 1, 3, 5	K.FC.2 K.NI.1
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?		K.ETS1.1 K.ETS1.2 K.ETS2.1	RL.K.1 RL.K.2 RL.K.3 SL.K.1.a SL.K.1.b	K.CC.A.3 → 6 Math Practices 1-5	K.FC.2 K.NI.1
Animals and Algorithms	How do you use algorithms in your daily life? How can you use computer programming to complete a task? How can a step-by-step process help you design or improve a solution to a problem?		K.ETS1.1 K.ETS1.2 K.ETS2.1	RL.K.3 W.K.3 W.K.6 SL.K.1.a SL.K.1.b SL.K.5	K.CC.A.1 K.CC.B.4 K.CC.B.5 K.G.A.1 Math Practices 1-3	K.FC.2 K.AT.1 K.NI.1

PLTW LAUNCH 1st Grade

	Essential Questions	Science Standards	Engineering Standards	CCSS ELA	CCSS Math	Computer Science
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?	1.PS4.1 1.PS4.2	1.ETS1.1 1.ETS2.1	RL.1.1 RL.1.2 RL.1.3 RI.1.1 RI.1.2 W.1.8 SL.1.1 SL.1.2 SL.1.5	Math Practices 1, 3, 5	1.FC.2 1.AT.1 1.AT.2 1.AT.3 1.NI.1
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?	1.LS1.1	1.ETS1.1 1.ETS2.1	RI.1.1 RI.1.2 RI.1.10 W.1.7 W.1.8 SL.1.1 SL.1.2 SL.1.5	1.G.A.1 1.G.A.2 Math Practices 1, 3, 5	1.FC.2 1.AT.1 1.AT.2 1.AT.3 1.NI.1
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?	1.ESS1.1 1.ESS1.2 1.ESS1.3	1.ETS1.1 1.ETS2.1	RL.1.1 RI.1.1 W.1.8 SL.1.1.C SL.1.5 SL.1.6	1.MD.A.1 1.MD.B.3 1.MD.C.4 Math Practices 1-6	1.FC.2 1.AT.1 1.AT.2 1.AT.3 1.DA.2 1.NI.1
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?		1.ETS1.1 1.ETS2.1	RL.1.1 RL.1.2 RL.1.3 W.1.3 W.1.6 SL.1.1.a SL.1.2 SL.1.4	Math Practices 1-8	1.FC.2 1.AT.1 1.AT.2 1.AT.3 1.DA.1 1.NI.1

PLTW LAUNCH 2nd Grade

	Essential Questions	Science Standards	Engineering Standards	CCSS ELA	CCSS Math	Computer Science
Animal Adaptations (3)	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?	2.LS1.1	2.ETS1.1 2.ETS1.2 2.ETS1.3 2.ETS1.4 2.ETS2.1	RL.1.1 RI.1.1 W.1.8 SL.1.2 SL.1.5 SL.1.6	1.NBT.C.4 1.MD.C.4 Math Practices 1-6	2.FC.2 → 4 2.AT.2 2.NI.1 2.IC.1
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?	2.LS2.1	2.ETS1.1 2.ETS1.2 2.ETS1.3 2.ETS1.4 2.ETS2.1	W.2.7 W.2.8	2.MD.A.1 2.MD.D.10 Math Practices 1-6	2.FC.2 → 4 2.AT.2 2.DA.1, 3 2.NI.1, 3 2.IC.1
Variation of Traits (3)	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?	2.LS3.1	2.ETS1.1 2.ETS1.2 2.ETS1.3 2.ETS1.4 2.ETS2.1	RI.3.1 RI.3.2 RI.3.3 RI.3.4 W.3.8 SL.3.1 SL.3.2	3.MD.B.3 Math Practices 1-7	2.FC.2 → 4 2.AT.2 2.NI.1 2.IC.1
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?	2.ESS2.1 2.ESS2.2 2.ESS2.3 2.ESS2.4	2.ETS1.1 2.ETS1.2 2.ETS1.3 2.ETS1.4 2.ETS2.1	RL.2.1 RI.2.1 RI.2.3 W.2.7 W.2.8 SL.2.1 SL.2.2	Math Practices 1-6	2.FC.2 → 4 2.AT.2 2.DA.1, 3 2.NI.1 2.IC.1
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?		2.ETS1.1 2.ETS1.2 2.ETS1.3 2.ETS1.4 2.ETS2.1	RL.2.1 RI.2.1 RI.2.3 W.2.8 SL.2.1 SL.2.2	Math Practices 1, 3-5	2.FC.2 → 4 2.AT.2 2.NI.1 2.IC.1
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?		2.ETS1.1 2.ETS1.2 2.ETS1.3 2.ETS1.4 2.ETS2.1	RL.2.1 RL.2.7 SL.2.1 SL.2.2	2.OA.B.2 2.NBT.B.5 Math Practices 1-4, 6	2.FC.2 → 4 2.AT.1, 2 2.NI.1 2.IC.1

PLTW LAUNCH 3rd Grade

	Essential Questions	Science Standards	Engineering Standards	CCSS ELA	CCSS Math	Computer Science
Materials Science: Properties of Matter (2)	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.PS1.1 3.PS1.2 3.PS1.3	3.ETS1.1 3.ETS1.2	RI.2.1 RI.2.3 W.2.7 W.2.8	2.MD.D.10 Math Practices 1, 3-6	3.FC.2, 3 3.AT.1, 3
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.PS2.1 3.PS2.2 3.PS3.3	3.ETS1.1 3.ETS1.2	RI.3.1 RI.3.3 W.3.7 W.3.8	Math Practices 1, 3, 5	3.FC.2, 3 3.AT.1, 3
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.LS4.1 3.LS4.2	3.ETS1.1 3.ETS1.2	RI.3.1 RI.3.2 RI.3.3 RI.3.4 W.3.2 W.3.7 W.3.8 SL.3.1 SL.3.4	Math Practices 1-5	3.FC.2, 3 3.AT.1, 3 3.DA.1
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.LS2.1 3.LS4.2	3.ETS1.1 3.ETS1.2	RI.3.1 RI.3.2 RI.3.3 RI.3.4 W.3.7 W.3.8 SL.3.1	Math Practices 1-3	3.FC.2, 3 3.AT.1, 3 3.DA.1
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.ESS2.3 3.ESS2.4 3.ESS3.1 3.ESS3.2	3.ETS1.1 3.ETS1.2	RI.3.1 RI.3.2 RI.3.3 RI.3.4 W.3.7 W.3.8 SL.3.1	3.MD.A.2 Math Practices 1-3, 5-6	3.FC.2, 3 3.AT.1, 3 3.DA.1,2
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.ETS1.1 3.ETS1.2	RI.3.1 RI.3.3 W.3.7 W.3.8 SL.3.1	3.MD.B.4 Math Practices 1-3, 5-6	3.FC.2, 3 3.AT.1, 3 3.DA.1
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.ETS1.1 3.ETS1.2 3.ETS2.1	RI.3.1 RI.3.2 RI.3.3 W.3.3 W.3.6 SL3.1 SL.3.2 L.3.1.A	Math Practices 1-3, 5-6, 8	3.FC.2, 3 3.AT.1 → 3 3.PC.1, 2

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4th Grade

	Essential Questions	Science Standards	Engineering Standards	CCSS ELA	CCSS Math	Computer Science
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?	4.PS3.1 4.PS3.2 4.PS3.3	4.ETS1.1 4.ETS2.1 4.ETS2.2 4.ETS2.3	RI.4.1 RI.4.2 RI.4.3 RI.4.4 RI.4.7 W.4.2 W.4.7 W.4.9 SL.4.1 SL.4.3 SL.4.4 SL.4.5	Math Practices 1, 3, 5-6	4.FC.1, 2 4.DA.1, 2 4.NI.1
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?	4.PS4.1 4.PS4.2	4.ETS1.1 4.ETS2.1 4.ETS2.2	SL.4.5	4.MD.C.5 4.MD.C.6 4.G.A.1 Math Practices 1-6	4.FC.1, 2 4.DA.1, 2 4.NI.1
Ecosystems: Flow of Matter and Energy (5)	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?	4.LS2.1 4.LS2.2 4.LS2.3 4.LS2.4 4.LS2.5	4.ETS1.1 4.ETS2.1 4.ETS2.2	RI.5.1 RI.5.3 RI.5.4 RI.5.7 RI.5.9 W.5.2.D W.5.7 W.5.8 W.5.9 SL.5.1 SL.5.2 SL.5.5	5.MD.B.2 Math Practices 1-6	4.FC.1, 2 4.DA.1, 2 4.NI.1
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?	4.LS4.1	4.ETS1.1 4.ETS2.1 4.ETS2.2 4.ETS2.3	RI.4.2 RI.4.3 RI.4.4 W.4.1.B W.4.2.D W.4.8 SL.4.1 SL.4.2 SL.4.4 SL.4.5	Math Practices 1, 3, 5-6	4.FC.1, 2 4.DA.1, 2 4.NI.1
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?	4.ESS1.1 4.ESS2.1 4.ESS2.2 4.ESS2.3 4.ESS2.4	4.ETS1.1 4.ETS2.1 4.ETS2.2	RI.4.3 RI.4.4 RI.4.7 W.4.2 W.4.7 W.4.8 W.4.9 SL.4.4 SL.4.5	Math Practices 1, 3, 5-6	4.FC.1, 2 4.DA.1, 2 4.NI.1
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?	4.ESS3.1	4.ETS1.1 4.ETS2.1 4.ETS2.2	RI.4.1 RI.4.3 RI.4.4 RI.4.9 W.4.2 W.4.7 W.4.8 W.4.9 SL.4.1 SL.4.4	Math Practices 1-4	4.FC.1, 2 4.DA.1, 2 4.NI.1
Input/Output: Human Brain	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?		4.ETS1.1 4.ETS2.1 4.ETS2.2	RI.4.1 RI.4.2 RI.4.3 RI.4.4 RI.4.7 W.4.2 W.4.7 W.4.9 SL.4.1 SL.4.3 SL.4.4 SL.4.5	Math Practices 1,3, 5-6	4.FC.1, 2 4.DA.1, 2 4.NI.1
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?		4.ETS1.1 4.ETS2.1 4.ETS2.2	RI.4.3 RI.4.4 W.4.2 W.4.4 SL.4.1 SL.4.2	Math Practices 1-5, 8	4.FC.1 → 3 4.AT.1, 2 4.DA.1, 2 4.NI.1 4.PC.1

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5th Grade

	Essential Questions	Science Standards	Engineering Standards	CCSS ELA	CCSS Math	Computer Science
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?	5.PS1.1 5.PS1.2 5.PS1.4	5.ETS1.1 5.ETS1.2 5.ETS2.1	RI.5.7 W.5.8 W.5.9 SL.5.1 SL.5.2 SL.5.4	5.MD.C.3 5.MD.C.4 Math Practices 1-6	5.AT.3
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?	5.PS2.3 5.PS2.5	5.ETS1.1 5.ETS1.2 5.ETS2.1	RI.5.3 RI.5.4 RI.5.7 RI.5.9 W.5.8 W.5.9 SL.5.1 SL.5.2 SL.5.4 SL.5.5	5.NBT.B.5 Math Practices 1-6	5.AT.3 5.DA.1
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?	5.ESS1.1 5.ESS1.2 5.ESS1.3 5.ESS1.4 5.ESS1.5 5.ESS1.6	5.ETS1.1 5.ETS1.2 5.ETS2.1	RI.5.1 RI.5.4 RI.5.7 RI.5.8 RI.5.9 W.5.1 W.5.2 W.5.7 W.5.8 SL.5.1 SL.5.2 SL.5.4 SL.5.5	Math Practices 1-4, 6	5.AT.3 5.DA.1
Robotics and Automation	How can automation and robotics by used to protect the Earth's resources and environment? How can the engineering design process be applied in daily life?		5.ETS1.1 5.ETS1.2 5.ETS2.1	RI.5.1 RI.5.7 RI.5.9 W.5.7 W.5.8 W.5.9 SL.5.1 SL.5.4	Math Practices 1, 3, 5, 6	5.AT.3
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?		5.ETS1.1 5.ETS1.2 5.ETS2.1	RI.5.1 RI.5.7 RI.5.9 W.5.7 W.5.8 W.5.9 SL.5.1 SL.5.4	Math Practices 1, 3, 5, 6	5.AT. 1 → 3 5.PC.1, 2
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?		5.ETS1.1 5.ETS2.1	RI.5.2 RI.5.3 RI.5.4 RI.5.7 RI.5.9 RI.5.10 W.5.2 W.5.4 W.5.9 SL.5.1 SL.5.4	5.NBT.A.2 Math Practices 1, 3, 6	5.AT.3 5.DA.1
Infection: Modeling and Simulation	How do computer models and simulations help us 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?		5.ETS1.1 5.ETS1.2 5.ETS2.1 5.ETS2.2	RI.5.2 RI.5.4 RI.5.7 RI.5.9 W.5.2 W.5.4 W.5.9 SL.5.1 SL.5.5	5.OA.A.1 5.NBT.A.3 5.NBT.A.4 5.NBT.B.6 Math Practices 1-6, 8	5.FC.1 5.AT.1 → 3 5.DA.1, 2 5.PC.1, 2