PLTW Launch Standards Guide

Massachusetts Science and Technology/ Engineering Curriculum Framework K-5

PLTW Launch (PreK-5) is designed to support your science learning needs. The modules are developed to ensure an unmatched experience, combining three-dimensional learning; unique, problem-based instructional approach; real-world applied learning; as well as Spanish language options – all in one program.

This Standards Guide shows how each PLTW Launch module supports the Massachusetts Science and Technology/ Engineering Curriculum Framework K-5. Because schools need the flexibility to implement the curriculum in the way that best meets their students' needs, PLTW Launch is designed to support a wide range of implementations. Whether the modules are offered in all classrooms, as a specials rotation, as grade level rotations, as an after-school program, or even as a summer learning implementation, PLTW Launch offers the flexibility to meet your needs.

Use this Standards Guide in combination with the Module Descriptions PDF as planning tools to explore how you can implement PLTW Launch as your elementary learning solution.

PLTW LAUNCH

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Kindergarten

	Disciplinary Core Idea	Standard	Objectives	PLTW Launch Modules
Earth and Space Sciences	ESS2. Earth's Systems	K-ESS2-1.	Use and share quantitative observations of local weather conditions to describe patterns over time.	Sunlight and Weather
		K-ESS2-2.	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment.	Living Things: Needs and Impacts
	ESS3. Earth and Human Activity	K-ESS3-2.	Obtain and use information about weather forecasting to prepare for, and respond to, different types of local weather.	Sunlight and Weather
		K-ESS3-3.	Communicate solutions to reduce the amount of natural resources an individual uses.	Living Things: Needs and Impacts
Life Science	LS1. From Molecules to Organisms: Structures and Processes	K-LS1-1.	Observe and communicate that animals (including humans) and plants need food, water, and air to survive. Animals get food from plants or other animals. Plants make their own food and need light to live and grow.	Living Things: Needs and Impacts
		K-LS1-2(MA).	Recognize that all plants and animals grow and change over time.	Standard not currently supported.
Physical Science	PS1. Matter and Its Interactions	K-PS1-1(MA).	Investigate and communicate the idea that different kinds of materials can be solid or liquid depending on temperature.	Matter: Floating and Sinking (PreK)
	PS2. Motion and Stability: Forces and interactions	K-PS2-1.	Compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Pushes and Pulls
	PS3. Energy	K-PS3-1.	Make observations to determine that sunlight warms materials on Earth's surface.	Sunlight and Weather
		K-PS3-2.	Use tools and materials to design and build a model of a structure that will reduce the warming effect of sunlight on an area.	Sunlight and Weather

First Grade

	Disciplinary Core Idea	Standard	Objectives	PLTW Launch Modules
Earth and Space Sciences	ESS1. Earth's Place in the Universe	1-ESS1-1.	Use observations of the Sun, Moon, and stars to describe that each appears to rise in one part of the sky, appears to move across the sky, and appears to set.	Light: Observing the Sun, Moon and Stars
		1-ESS1-2.	Analyze provided data to identify relationships among seasonal patterns of change, including relative sunrise and sunset time changes, seasonal temperature and rainfall or snowfall patterns, and seasonal changes to the environment.	Light: Observing the Sun, Moon and Stars
Life Science	LS1. From Molecules to Organisms: Structures and Processes	1-LS1-1.	Use evidence to explain that (a) different animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air, and (b) plants have roots, stems, leaves, flowers, and fruits that are used to take in water, air, and other nutrients, and produce food for the plant.	Animal Adaptations
		1-LS1-2.	Obtain information to compare ways in which the behavior of different animal parents and their offspring help the offspring to survive.	Designs Inspired by Nature
	LS3. Heredity: Inheritance and Variation of Traits	1-LS3-1.	Use information from observations (first-hand and from media) to identify similarities and differences among individual plants or animals of the same kind.	Designs Inspired by Nature
Physical Science	PS4. Waves and Their Applications in Technologies for Information Transfer	1-PS4-1.	Demonstrate that vibrating materials can make sound and that sound can make materials vibrate.	Light and Sound
		1-PS4-3.	Conduct an investigation to determine the effect of placing materials that allow light to pass through them, allow only some light through them, block all the light, or redirect light when put in the path of a beam of light.	Light and Sound
		1-PS4-4.	Use tools and materials to design and build a device that uses light or sound to send a signal over a distance.	Light and Sound
Technology/ Engineering	ETS1. Engineering Design	1.K-2-ETS1-1.	Ask questions, make observations, and gather information about a situation people want to change that can be solved by developing or improving an object or tool.	Connected to PLTW Launch modules in grades kindergarten through second.
		1.K-2-ETS1-2.	Generate multiple solutions to a design problem and make a drawing (plan) to represent one or more of the solutions.	Connected to PLTW Launch modules in grades kindergarten through second.

Second Grade

	Disciplinary Core Ideas	Standard	Objectives	PLTW Launch Modules
Earth and Space Sciences	ESS2. Earth's Systems	2-ESS2-1.	Investigate and compare the effectiveness of multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	The Changing Earth
		2-ESS2-2.	Map the shapes and types of landforms and bodies of water in an area.	The Changing Earth
		2-ESS2-3.	Use examples obtained from informational sources to explain that water is found in the ocean, rivers and streams, lakes and ponds, and may be solid or liquid.	The Changing Earth
		2-ESS2-4(MA).	Observe how blowing wind and flowing water can move Earth materials from one place to another and change the shape of a landform.	The Changing Earth
Life Science	LS2. Ecosystems: Interactions, Energy, and Dynamics	2-LS2-3(MA).	Develop and use models to compare how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.	Living Things: Diversity of Life
	LS4. Biological Evolution: Unity and Diversity	2-LS4-1.	Use texts, media, or local environments to observe and compare (a) different kinds of living things in an area, and (b) differences in the kinds of living things living in different types of areas.	Living Things: Diversity of Life
Physical Science	PS1. Matter and Its Interactions	2-PS1-1.	Describe and classify different kinds of materials by observable properties of color, flexibility, hardness, texture, and absorbency.	Materials Science: Properties of Matter
		2-PS1-2.	Test different materials and analyze the data obtained to determine which materials have the properties that are best suited for an intended purpose.	Materials Science: Properties of Matter Materials Science: Form and Function
		2-PS1-3.	Analyze a variety of evidence to conclude that when a chunk of material is cut or broken into pieces, each piece is still the same material and, however small each piece is, has weight. Show that the material properties of a small set of pieces do not change when the pieces are used to build larger objects.	Materials Science: Properties of Matter Materials Science: Form and Function
		2-PS1-4.	Construct an argument with evidence that some changes to materials caused by heating or cooling can be reversed and some cannot.	Materials Science: Properties of Matter
	PS3. Energy	2-PS3-1(MA).	Design and conduct an experiment to show the effects of friction on the relative temperature and speed of objects that rub against each other.	Standard not currently supported.
Technology/ Engineering	ETS1. Engineering Design	2.K-2-ETS1-3.	Analyze data from tests of two objects designed to solve the same design problem to compare the strengths and weaknesses of how each object performs.	Connected to PLTW Launch modules in grades kindergarten through second.

Third Grade

	Disciplinary Core Idea	Standard	Objectives	PLTW Launch Modules
Earth and Space Sciences	ESS2. Earth's Systems	3-ESS2-1.	Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area.	Weather: Factors and Hazards
		3-ESS2-2.	Obtain and summarize information about the climate of different regions of the world to illustrate that typical weather conditions over a year vary by region.	Weather: Factors and Hazards
	ESS3. Earth and Human Activity	3-ESS3-1.	Evaluate the merit of a design solution that reduces the damage caused by weather.	Weather: Factors and Hazards
Life Science	LS1. From Molecules to Organisms: Structures and Processes	3-LS1-1.	Use simple graphical representations to show that different types of organisms have unique and diverse life cycles. Describe that all organisms have birth, growth, reproduction, and death in common but there are a variety of ways in which these happen.	Life Cycles and Survival
	LS3. Heredity: Inheritance and Variation of Traits	3-LS3-1.	Provide evidence, including through the analysis of data, that plants and animals have traits inherited from parents and that variation of these traits exist in a group of similar organisms.	Variation of Traits
		3-LS3-2.	Distinguish between inherited characteristics and those characteristics that result from a direct interaction with the environment. Give examples of characteristics of living organisms that are influenced by both inheritance and the environment.	Variation of Traits
	LS4. Biological Evolution: Unity and Diversity	3-LS4-1.	Use fossils to describe types of organisms and their environments that existed long ago and compare those to living organisms and their environments. Recognize that most kinds of plants and animals that once lived on Earth are no longer found anywhere.	Environmental Changes
		3-LS4-2.	Use evidence to construct an explanation for how the variations in characteristics among individuals within the same species may provide advantages to these individuals in their survival and reproduction.	Variation of Traits
		3-LS4-3.	Construct an argument with evidence that in a particular environment some organisms can survive well, some survive less well, and some cannot survive.	Environmental Changes
		3-LS4-4.	Analyze and interpret given data about changes in a habitat and describe how the changes may affect the ability of organisms that live in that habitat to survive and reproduce.	Environmental Changes
		3-LS4-5(MA).	Provide evidence to support a claim that the survival of a population is dependent upon reproduction.	Life Cycles and Survival
Physical Science	PS2. Motion and Stability: Forces and Interactions	3-PS2-1.	Provide evidence to explain the effect of multiple forces, including friction, on an object. Include balanced forces that do not change the motion of the object and unbalanced forces that do change the motion of the object.	Stability and Motion: Science of Flight Stability and Motion: Forces and Interactions
		3-PS2-3.	Conduct an investigation to determine the nature of the forces between two magnets based on their orientations and distance relative to each other.	Stability and Motion: Forces and Interactions
		3-PS2-4.	Define a simple design problem that can be solved by using interactions between magnets.	Stability and Motion: Forces and Interactions
Technology/ Engineering	ETS1. Engineering Design	3.3-5-ETS1-1.	Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.	Connected to PLTW Launch modules in grades third through fifth.
		3.3-5-ETS1-2.	Generate several possible solutions to a given design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.	Connected to PLTW Launch modules in grades third through fifth.
		3.3-5-ETS1-4(MA).	Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution.	Connected to PLTW Launch modules in grades third through fifth.

Fourth Grade

	Disciplinary Core Idea	Standard	Objectives	PLTW Launch Modules
Earth and Space Sciences	ESS1. Earth's Place in the Universe	4-ESS1-1.	Use evidence from a given landscape that includes simple landforms and rock layers to support a claim about the role of erosion or deposition in the formation of the landscape over long periods of time.	Earth: Past, Present and Future
	ESS2. Earth's Systems	4-ESS2-1.	Make observations and collect data to provide evidence that rocks, soils, and sediments are broken into smaller pieces through mechanical weathering and moved around through erosion.	Earth: Past, Present and Future
		4-ESS2-2.	Analyze and interpret maps of Earth's mountain ranges, deep ocean trenches, volcanoes, and earthquake epicenters to describe patterns of these features and their locations relative to boundaries between continents and oceans.	Earth: Past, Present and Future
	ESS3. Earth and Human Activity	4-ESS3-1.	Obtain information to describe that energy and fuels humans use are derived from natural resources and that some energy and fuel sources are renewable and some are not.	Earth: Human Impact and Natural Disasters
		4-ESS3-2.	Evaluate different solutions to reduce the impacts of a natural event such as an earthquake, blizzard, or flood on humans.	Earth: Human Impact and Natural Disasters
Life Science	LS1. From Molecules to Organisms: Structures and Processes	4-LS1-1.	Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction.	Organisms: Structure and Function
Physical Science	PS3. Energy	4-PS3-1.	Use evidence to construct an explanation relating the speed of an object to the energy of that object.	Energy Exploration
		4-PS3-2.	Make observations to show that energy can be transferred from place to place by sound, light, heat, and electric currents.	Energy Exploration
		4-PS3-3.	Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Energy Exploration
		4-PS3-4.	Apply scientific principles of energy and motion to test and refine a device that converts kinetic energy to electrical energy or uses stored energy to cause motion or produce light or sound.	Energy Exploration
	PS4. Waves and Their Applications in Technologies for Information Transfer	4-PS4-1.	Develop a model of a simple mechanical wave (including sound) to communicate that waves (a) are regular patterns of motion along which energy travels and (b) can cause objects to move.	Waves and the Properties of Light
		4-PS4-2.	Develop a model to describe that light must reflect off an object and enter the eye for the object to be seen.	Waves and the Properties of Light
		4-PS4-3.	Develop and compare multiple ways to transfer information through encoding, sending, receiving, and decoding a pattern.	Input/Output: Computer Systems
Technology/ Engineering	ETS1. Engineering Design	4.3-5-ETS1-3	Plan and carry out tests of one or more design features of a given model or prototype in which variables are controlled and failure points are considered to identify which features need to be improved. Apply the results of tests to redesign a model or prototype.	Connected to PLTW Launch modules in grades third through fifth.
		4.3-5-ETS1-5(MA).	Evaluate relevant design features that must be considered in building a model or prototype of a solution to a given design problem.	Connected to PLTW Launch modules in grades third through fifth.

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Fifth Grade

	Disciplinary Core Idea		Objectives	PLTW Launch Modules
Earth and Space Sciences	ESS1. Earth's Place in the Universe	5-ESS1-1.	Use observations, first-hand and from various media, to argue that the Sun is a star that appears larger and brighter than other stars because it is closer to Earth.	Patterns in the Universe
		5-ESS1-2.	Use a model to communicate Earth's relationship to the Sun, Moon, and other stars that explain (a) why people on Earth experience day and night, (b) patterns in daily changes in length and direction of shadows over a day, and (c) changes in the apparent position of the Sun, Moon, and stars at different times during a day, over a month, and over a year.	Patterns in the Universe
	ESS2. Earth's Systems	5-ESS2-1.	Use a model to describe the cycling of water through a watershed through evaporation, precipitation, absorption, surface runoff, and condensation.	Standard not currently supported.
		5-ESS2-2.	Describe and graph the relative amounts of salt water in the ocean; fresh water in lakes, rivers, and groundwater; and fresh water frozen in glaciers and polar ice caps to provide evidence about the availability of fresh water in Earth's biosphere.	Earth's Water and Interconnected Systems
	ESS3. Earth and Human Activity	5-ESS3-1.	Obtain and combine information about ways communities reduce human impact on the Earth's resources and environment by changing an agricultural, industrial, or community practice or process.	Robotics and Automation Earth's Water and Interconnected Systems
		5-ESS3-2(MA).	Test a simple system designed to filter particulates out of water and propose one change to the design to improve it.	Earth's Water and Interconnected Systems
Life Science	LS1. From Molecules to Organisms: Structures and Processes	5-LS1-1.	Ask testable questions about the process by which plants use air, water, and energy from sunlight to produce sugars and plant materials needed for growth and reproduction.	Ecosystems: Flow of Matter and Energy
	LS2. Ecosystems: Interactions, Energy, and Dynamics	5-LS2-1.	Develop a model to describe the movement of matter among producers, consumers, decomposers, and the air, water, and soil in the environment to (a) show that plants produce sugars and plant materials, (b) show that animals can eat plants and/or other animals for food, and (c) show that some organisms, including fungi and bacteria, break down dead organisms and recycle some materials back to the air and soil.	Ecosystems: Flow of Matter and Energy
		5-LS2-2(MA).	Compare at least two designs for a composter to determine which is most likely to encourage decomposition of materials.	Standard not currently supported.

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Fifth Grade (cont.)

	Disciplinary Core Idea		Objectives	PLTW Launch Modules
Physical Science	PS1. Matter and Its Interactions	5-PS1-1.	Use a particle model of matter to explain common phenomena involving gases, and phase changes between gas and liquid and between liquid and solid.	Matter: Properties and Reactions
		5-PS1-2.	Measure and graph the weights (masses) of substances before and after a reaction or phase change to provide evidence that regardless of the type of change that occurs when heating, cooling, or combining substances, the total weight (mass) of matter is conserved.	Matter: Properties and Reactions
		5-PS1-3.	Make observations and measurements of substances to describe characteristic properties of each, including color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility.	Matter: Properties and Reactions
		5-PS1-4.	Conduct an experiment to determine whether the mixing of two or more substances results in new substances with new properties (a chemical reaction) or not (a mixture).	Matter: Properties and Reactions
	PS2. Motion and Stability: Forces and Interactions	5-PS2-1.	Support an argument with evidence that the gravitational force exerted by Earth on objects is directed toward Earth's center.	Earth's Water and Interconnected Systems
	PS3. Energy	5-PS3-1.	Use a model to describe that the food animals digest (a) contains energy that was once energy from the Sun, and (b) provides energy and nutrients for life processes, including body repair, growth, motion, body warmth, and reproduction.	Ecosystems: Flow of Matter and Energy
Technology/ Engineering	ETS3. Technological Systems	5.3-5-ETS3-1(MA).	Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.	Connected to PLTW Launch modules in grades third through fifth.
		5.3-5-ETS3-2(MA).	Use sketches or drawings to show how each part of a product or device relates to other parts in the product or device.	Connected to PLTW Launch modules in grades third through fifth.