PLTW Launch Standards Connection
Third Grade

Connections to Standards in PLTW Launch

PLTW curriculum is designed to empower students to thrive in an evolving world. As a part of the design process when developing and updating our curriculum, we focus on connections to a variety of standards. PLTW Launch modules connect to standards in the following:

Motion and Stability: Forces and Interactions

3-PS2-1
Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

3-PS2-2
Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

3-PS2-3
Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

- ☐ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

3-PS2-4
Define a simple design problem that can be solved by applying scientific ideas about magnets.

- ☐ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Next Generation Science Standards

From Molecules to Organisms: Structures and Processes

3-LS1-1
Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☐ Environmental Changes

Ecosystems: Interactions, Energy, and Dynamics

3-LS2-1
Construct an argument that some animals form groups that help members survive.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☐ Environmental Changes

Heredity: Inheritance and Variation of Traits

3-LS3-1
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.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

3-LS3-2
Use evidence to support the explanation that traits can be influenced by the environment.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Biological Evolution: Unity and Diversity

3-LS4-1
Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

3-LS4-2
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.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

3-LS4-3
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.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

3-LS4-4
Make a claim 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.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Next Generation Science Standards

Earth's Systems

3-ESS2-1
Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

3-ESS2-2
Obtain and combine information to describe climates in different regions of the world.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Earth and Human Activity

3-ESS3-1
Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Engineering Design

3-5-ETS1-1
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Next Generation Science Standards

3-5-ETS1-2

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

3-5-ETS1-3

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Science and Engineering Practices

Asking Questions and Defining Problems

Asking questions and defining problems in 3–5 builds on K–2 experiences and progresses to specifying qualitative relationships.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☐ Environmental Changes

Next Generation Science Standards

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Using Mathematics and Computational Thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Next Generation Science Standards

Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Disciplinary Core Ideas (3-5)

Life Science

LS1.B Growth and Development of Organisms

• Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique diverse life cycles.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☐ Environmental Changes

LS2.C Ecosystem Dynamics, Functioning, and Resilience

• When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Next Generation Science Standards

LS2.D Social Interactions and Group Behavior

• Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☐ Environmental Changes

LS3.A Inheritance of Traits

• Many characteristics of organisms are inherited from their parents.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

LS3.A Inheritance of Traits

• Other characterics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

LS3.B Variation of Traits

• Different organisms vary in how they look and function because they have different inherited information.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

LS3.B Variation of Traits

• The environment also affects the traits that an organism develops.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Next Generation Science Standards

LS4.A Evidence of Common Ancestry and Diversity

• Some kinds of plants and animals that once lived on Earth are no longer found anywhere.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

LS4.A Evidence of Common Ancestry and Diversity

• Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

LS4.B Natural Selection

• Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

LS4.C Adaptation

• For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

LS4.D Biodiversity and Humans

• Populations live in a variety of habitats, and change in those habitats affects the organisms living there.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Next Generation Science Standards

Earth and Space Science

ESS2.D Weather and Climate

• Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

ESS2.D Weather and Climate

• Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

ESS3.B Natural Hazards

• A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Engineering, Technology, and Applications of Science

ETS1.A Defining and Delimiting Engineering Problems

• Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Next Generation Science Standards

ETS1.B Developing Possible Solutions

• Research on a problem should be carried out before beginning to design a solution.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

ETS1.B Developing Possible Solutions

• At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

ETS1.B Developing Possible Solutions

• Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

ETS1.B Developing Possible Solutions

• Testing a solution involves investigating how well it performs under a range of likely conditions.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [ ] Programming Patterns
- [x] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

ETS1.C Optimizing the Design Solution

• Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

Next Generation Science Standards

Physical Science

PS2.A Forces and Motion

• Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [ ] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

PS2.A Forces and Motion

• The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [ ] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

PS2.B Types of Interactions

• Objects in contact exert forces on each other.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [ ] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

PS2.B Types of Interactions

• Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.

- [ ] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [ ] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

Crosscutting Concepts (3-5)

Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

• Patterns of change can be used to make predictions.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

• Cause and effect relationships are routinely identified, tested, and used to explain change.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Scale, Proportion, and Quantity – In considering phenomena, it is critical to recognize what is relevant at different size, time, and energy scales, and to recognize proportional relationships between different quantities as scales change.

• Observable phenomena exist from very short to very long time periods.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

• A system can be described in terms of its components and their interactions.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Connections to Engineering, Technology, and Applications of Science (3-5)

Interdependence of Science, Engineering, and Technology

• Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Influence of Science, Engineering, and Technology on Society and the Natural World

• People's needs and wants change over time, as do their demands for new and improved technologies.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

• Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Connections to the Nature of Science (3-5)

Science is a Human Endeavor

• Science affects everyday life.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Next Generation Science Standards

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes consistent patterns in natural systems.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Scientific Knowledge is Based on Empirical Evidence

- Science findings are based on recognizing patterns.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☐ Environmental Changes

Scientific Investigations Use a Variety of Methods

- Science investigations use a variety of methods, tools, and techniques.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Computer Science Teachers Association K-12 Computer Science

In Spring 2023 PLTW submitted all necessary documentation required by the Computer Science Teachers Association (CSTA) for a crosswalk review of our Launch and Gateway curricula by the CSTA Standards Review Team. While we anticipate approval and validation by CSTA, the review is pending.

Computing Systems

Hardware & Software

1B-CS-02

Model how computer hardware and software work together as a system to accomplish tasks.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Troubleshooting

1B-CS-03

Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Networks and the Internet

Cybersecurity

1B-NI-05

Discuss real-world cybersecurity problems and how personal information can be protected.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Data and Analysis

Collection Visualization & Transformation

1B-DA-06
Organize and present collected data visually to highlight relationships and support a claim.

- [x] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [ ] Programming Patterns
- [x] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [x] Environmental Changes

Inference & Models

1B-DA-07
Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.

- [x] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [ ] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

Algorithms and Programming

Algorithms

1B-AP-08
Compare and refine multiple algorithms for the same task and determine which is the most appropriate.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [x] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

Control

1B-AP-10
Create programs that include sequences, events, loops, and conditionals.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [x] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

Computer Science Teachers Association K-12 Computer Science

Modularity

1B-AP-11

Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Program Development

1B-AP-13

Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Program Development

1B-AP-15

Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Program Development

1B-AP-16

Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Computer Science Teachers Association K-12 Computer Science

Program Development

1B-AP-17

Describe choices made during program development using code comments, presentations, and demonstrations.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Reading Informational Text Standards

Key Ideas and Details

CCSS.ELA-LITERACY.RI.3.1

Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

CCSS.ELA-LITERACY.RI.3.2

Determine the main idea of a text; recount the key details and explain how they support the main idea.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

CCSS.ELA-LITERACY.RI.3.3

Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

Craft and Structure

CCSS.ELA-LITERACY.RI.3.4

Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [ ] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

Writing Standards

Text Types and Purposes

CCSS.ELA-LITERACY.W.3.2
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

CCSS.ELA-LITERACY.W.3.3
Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Production and Distribution of Writing

CCSS.ELA-LITERACY.W.3.6
With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Research to Build and Present Knowledge

CCSS.ELA-LITERACY.W.3.7
Conduct short research projects that build knowledge about a topic.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Common Core State Standards English Language Arts - Third Grade

CCSS.ELA-LITERACY.W.3.8
Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

- ☑ Stability and Motion: Science of Flight
- ☑ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

Speaking and Listening Standards

Comprehension and Collaboration

CCSS.ELA-LITERACY.SL.3.1
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☑ Life Cycles and Survival
- ☑ Environmental Changes

CCSS.ELA-LITERACY.SL.3.2
Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Presentation of Knowledge and Ideas

CCSS.ELA-LITERACY.SL.3.4
Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☑ Environmental Changes

Language Standards

Conventions of Standard English

CCSS.ELA-LITERACY.L.3.1

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

CCSS.ELA-LITERACY.L.3.1.A

Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☑ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Measurement and Data

Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

CCSS.MATH.CONTENT.3.MD.A.2

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☑ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Represent and interpret data.

CCSS.MATH.CONTENT.3.MD.B.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

- ☐ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☑ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

CCSS.MATH.CONTENT.3.MD.B.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

- ☑ Stability and Motion: Science of Flight
- ☐ Stability and Motion: Forces and Interactions
- ☐ Variation of Traits
- ☐ Programming Patterns
- ☐ Weather: Factors and Hazards
- ☐ Life Cycles and Survival
- ☐ Environmental Changes

Common Core State Standards Mathematics - Third Grade

Mathematical Practices

CCSS.MATH.PRACTICE.MP1
Make sense of problems and persevere in solving them.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

CCSS.MATH.PRACTICE.MP2
Reason abstractly and quantitatively.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

CCSS.MATH.PRACTICE.MP3
Construct viable arguments and critique the reasoning of others.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [x] Life Cycles and Survival
- [x] Environmental Changes

CCSS.MATH.PRACTICE.MP4
Model with mathematics.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [ ] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [x] Environmental Changes

CCSS.MATH.PRACTICE.MP5
Use appropriate tools strategically.

- [x] Stability and Motion: Science of Flight
- [x] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [x] Environmental Changes

Common Core State Standards Mathematics - Third Grade

CCSS.MATH.PRACTICE.MP6
Attend to precision.

- [x] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [x] Programming Patterns
- [x] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

CCSS.MATH.PRACTICE.MP7
Look for and make use of structure.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [x] Variation of Traits
- [ ] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

CCSS.MATH.PRACTICE.MP8
Look for and express regularity in repeated reasoning.

- [ ] Stability and Motion: Science of Flight
- [ ] Stability and Motion: Forces and Interactions
- [ ] Variation of Traits
- [x] Programming Patterns
- [ ] Weather: Factors and Hazards
- [ ] Life Cycles and Survival
- [ ] Environmental Changes

References

Computer Science Teachers Association. (2017). *CSTA K-12 Computer Science Standards, revised 2017*. http://www.csteachers.org/standards

National Governors Association Center for Best Practices, & Council of Chief State School Officers. (2010). *Common Core State Standards.* National Governors Association Center for Best Practices, Council of Chief State School Officers.

NGSS Lead States. (2013). *Next Generation Science Standards: For states, by states.* National Academies Press.