PLTW Launch Modules related to Computer Science

**Animals and Algorithms – K.4**

Students explore the nature of computers and the ways humans control and use technology. Starting with an unplugged activity, students learn about the sequential nature of computer programs. Students are inspired by a story in which Angelina, Mylo, and Suzi make videos to teach preschoolers about animals in their habitats. Then, students work in small groups to design and program a simple digital animation about an animal in its habitat.

**Animated Storytelling – 1.4**

Students explore the sequential nature of computer programs through hands-on activities, both with and without a computer. They examine key aspects of storytelling and devise how to transition a narrative from page to screen. Students discover the design problem through a story about Angelina, Mylo, and Suzi, who wish they could find a way to create a story with characters who move and interact with each other. Combining fundamental principles of computer science with story-building skills, students develop animations that showcase characters, settings, actions, and events from short stories of their own creation.

**Grids and Games –2.4**

Students investigate numerical relationships while learning about the sequence and structure required in computer programs. Starting with computer-free activities and moving to tablet-based challenges, students apply addition and subtraction strategies to make characters move on a grid. Angelina presents the design problem when she expresses her desire to design a game she can play on her tablet. Using skills and knowledge gained from these activities, students work together in groups to design and develop a game in which a player interacts with objects on a tablet screen.

**Programming Patterns –3.4**

This module introduces students to the power of modularity and abstraction. Starting with computer-free activities and progressing to programming in a blocks-based language on a tablet, students learn how to think computationally about a problem. Angelina, Mylo, and Suzi set the stage for the design problem as they discuss their desire to create video games on their tablet. Students then create a tablet game using modular functions and branching logic.

**Input/Output: Computer Systems –4.3**

In this exploration of how computers work, students are encouraged to make analogies between the parts of the human body and parts that make up a computer. Students investigate reaction time as a measure of nervous system function. After Mylo suffers a concussion, his friends become interested in how to diagnose concussions and create a reaction-time computer program to assess a baseline before a concussion occurs. Students apply what they have learned to build their own reaction-time measurement devices on tablets. This module has strong connections to the fourth grade Human Brain module.

**Robotics and Automation – 5.1**

Students explore the ways robots are used in today’s world and their impact on society and the environment. Students learn about a variety of robotic components as they build and test mobile robots that may be controlled remotely. Angelina, Mylo, and Suzi are tasked with designing a mobile robot that can remove hazardous materials from a disaster site. Students are then challenged to design, model, and test a mobile robot that solves this design problem.

**Robotics and Automation: Challenge – 5.2 (Sixth Grade)**

Students expand their understanding of robotics as they explore mechanical design and computer programming. This module focuses on developing skills needed to build and program autonomous robots. Angelina, Mylo, and Suzi are tasked with designing an automatic-guided vehicle to deliver supplies to a specific area in a hospital without being remotely controlled by a person. Inspired by this design problem, students work with a group to apply their knowledge to design, build, test, and refine a mobile robot that meets a set of design constraints.