Enhancements Coming to the PLTW K-12 CS Pathway

We believe that all students – beginning at a young age – need access to high-quality computer science education. Computer science is rapidly changing, and with that evolution, we are reinforcing our commitment to providing an inspiring and inclusive K-12 computer science experience that empowers students at every age level, appeals to students of diverse backgrounds, and challenges them to solve real-world problems.

As we advance our PLTW Computer Science pathway experience and incorporate the feedback from our teachers and master teachers, we are excited to introduce two new computer science units at the middle school level and extend the semester-long Introduction to Computer Science (ICS) unit to a full-year high school course. These new offerings will be available in fall 2017.

This enhancement will provide more opportunities to students and help districts and schools ensure smoother transitions between elementary, middle, and high school computer science coursework by providing specific computer science experiences for each grade level.

We look forward to partnering with you to implement these new PLTW Computer Science pathway enhancements and to continue empowering students with the in-demand knowledge and transportable skills they need to thrive in our evolving world.

New PLTW Gateway Computer Science Units

Made for Innovators, Makers, and Creators
Beginning with the 2017-18 school year, two new middle school computer science units will be available to districts and schools.

These units will build on our proven activity-, project-, problem-based (APB) instructional approach and empower students to solve problems using the powerful ideas behind computational thinking. The units will accommodate students who are new to computer science and also challenge those who have had previous experiences in computing.

- **PLTW Computer Science for Innovators and Makers:** In this new unit, students will discover computer science concepts and skills by creating personally relevant, visible, tangible, and sharable projects. Throughout the unit, students will learn about programming for the physical world by blending hardware design and software development. They will design and develop a physical computing device, interactive art installation, or wearable and plan and develop code for microcontrollers that bring their physical designs to life.

  Physical computing projects will promote student awareness of interactive systems, including Internet of Things (IoT) devices, and broaden their understanding of abstract computer science concepts through meaningful and authentic applications.

- **PLTW App Creators:** This second unit will introduce students to the field of computer science and the concepts of computational thinking through the creation of mobile apps. Content will challenge students to be creative and innovative as they collaboratively design and develop mobile solutions to engaging real-world problems.

The unit will expose students to computer science as a means of computationally analyzing and developing solutions to authentic problems, and will convey the positive impact of the application of computer science to other disciplines and to society.

Students will customize their experience by choosing a problem that interests them from the areas of health, environment, emergency preparedness, education, community service, and school culture. Because problems in the real world involve more than one discipline, students will be introduced to biomedical science concepts as they work on solutions for the specific problems they choose to tackle.

Flexible Implementation to Meet the Needs of Your School
Each unit will provide content for 45 sessions of 45 minutes of instruction, allowing schools to establish a schedule that meets their needs. For example, a school can offer the content daily over nine weeks to meet a quarter rotation schedule, or meet twice a week and cover the content on a semester schedule.

The units will incorporate revised CSTA middle school standards and align to concepts and practices from the newly released K-12 CS Frameworks, as well as relevant national math, language arts, and science standards.

A New Full-Year CS Course for High School

Computer Science Essentials for All Students
To provided more opportunities for students at the high school level, we will expand the semester-long ICS course to a full-year course and build on our APB instructional approach. The expanded and renamed course – **PLTW Computer Science Essentials** – will empower students to develop computational thinking skills that prepare them to advance to Computer Science Principles (CSP) and Computer Science A (CSA). Course content will align to the CSTA K-12 standards and newly released K-12 CS Frameworks.

In PLTW Computer Science Essentials, students will experience the major topics, big ideas, and computational thinking practices used by computing professionals to solve problems and create value for others. They will use a visual programming language and advance to text-based programming. Throughout the course, students will have opportunities to apply computational thinking practices and collaborate just as computing professionals do to create products that address topics and problems important to them.

The updated course will recognize the diversity of students' prior knowledge in computer science, welcoming students with limited knowledge but also challenging those with previous CS experience.

Implementing the New Experiences

Creating Smoother Transitions and More Opportunities for Students
Offering ICS at both the middle and high school levels often created a challenge for students, teachers, and school and district leaders. Students were faced with one- or two-year gaps in their computer science education, and school and district leaders had to make tough choices around where and when to offer ICS.

Now, with dedicated computer science experiences for students in grades 6-8 and a more robust full-year high school course, we have enhanced our K-12 Computer Science pathway.

A Supported Transition for Middle Schools
The Computer Science for Innovators and Makers unit and the App Creators unit will be ready for you to implement in fall 2017 for the 2017-18 school year. We will offer training options starting in summer 2017 to support a smooth transition to the new units.

- Middle schools offering PLTW computer science content for the first time will implement the new units and participate in a separate Core Training experience for each unit.

- Middle schools currently offering ICS have the option to continue with ICS for the 2017-18 school year and implement the new units in 2018-19, or implement the new units right away. We recommend making the transition early to enjoy the benefits these new units offer students and teachers.

  Because we are excited for ICS teachers to transition to the new units and recognize the investment schools have made in their teachers and students, there will be no additional professional development fee for current ICS teachers to take part in the training for either new unit.

  - To offer Computer Science for Innovators and Makers, which covers new content not currently found in the ICS units, all teachers will attend summer Core Training, structured similarly in duration and approach to our current PLTW Gateway Core Trainings.
  - To offer PLTW App Creators, PLTW Gateway teachers credentialed in ICS will take part in an update training online (4-6 hours in duration) and an have access to optional in-person workshop as well.

A Supported Transition for High Schools
Computer Science Essentials will be offered as a beta version starting in fall 2017, for the 2017-18 school year. Any interested high school may offer this beta version.

High schools currently offering ICS have the option to continue offering the current ICS unit in 2017-18, or enhance their PLTW Computer Science Program with the new Computer Science Essentials course for 2017-18.
For the new course, both new teachers and ICS-credentialed teachers will take part in a concurrent Online Core Training experience for the 2017-18 school year.

For schools choosing to offer the new course for the first time in 2018-19, non-ICS-credentialed teachers will attend Core Training in summer 2018. ICS-credentialed teachers will have an update training option starting in summer 2018.

There will be no additional professional development fee for ICS-credentialed teachers.

More Information

In the coming months, we'll bring you more information about the new middle school units and full-year high school course. We will release the new unit and course outlines in January 2017, and the hardware and software requirements for the new offerings in early 2017 as well.

Please contact the **PLTW Solution Center** with any questions. We look forward to partnering with you to provide students with more inclusive, engaging computer science options that will empower them to thrive in an evolving world.