



"PLTW classes focus on hands-on and real-life experience. What I liked the most about these classes was having the freedom of designing my final project. I can only encourage other students to take PLTW courses, challenge themselves, and remember that no dream is unattainable."

Cheyla Moranchel, PLTW Engineering student, Class of 2014
John F. Kennedy High School, Mt. Angel, Oregon

Preparing Students for the Global Economy

Project Lead The Way (PLTW) is a 501(c)(3) nonprofit organization and the nation's leading provider of K-12 STEM programs. Through world-class, activity-, project-, and problem-based curriculum, high-quality teacher professional development, and an engaged network of educators and corporate partners, PLTW helps students develop the skills needed to succeed in our global economy.

PLTW courses are aligned with national standards in math and English language arts, Next Generation Science Standards, and CSTA K-12 Computer Science Standards. Courses and units are designed to complement math and science courses, and in some instances, are used as the core curriculum.

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PLTW | Engineering

Design for a Successful
Future Awaits



LET'S CHALLENGE OUR STUDENTS TO ENGINEER A BETTER WORLD

The influence of engineering is extensive. Engineering drives lofty innovations, such as space flight, and accessible yet significant breakthroughs, like greener household appliances. Today's students have limitless potential to build on such progress – when equipped with a strong early interest, critical-thinking skills, and problem-solving competencies.

With current projections indicating that more than 1.2 million U.S. jobs in science, technology, engineering, and math (STEM) will go unfilled by 2018, the time to expand the engineering talent pool is now.

Engaging student interest is imperative, as studies have shown that 75 percent of students talented in math and science during their K – 12 years decide not to pursue STEM in college. In addition, the field of engineering is grappling with an underutilization of potential resources: Only 13 percent of American engineers are women, while underrepresented minorities account for just 12 percent of the engineering workforce.

How can we engage student interest and equip all students with the skills needed for a brighter future?

PLTW Engineering

PLTW Engineering™ is more than just another high school engineering program. It is about applying science, technology, engineering, and math through a project-based, hands-on approach to solve complex, open-ended problems in a real-world context. Students focus on the process of defining and solving a problem, not on getting the “right” answer. They learn how to apply STEM knowledge, skills, and habits of mind to make the world a better place through innovation.

PLTW students say that PLTW Engineering influenced their post-secondary decisions and helped shape their future. PLTW students are shown to study engineering and other STEM disciplines at a rate significantly higher than their non-PLTW peers.

Even for students who do not plan to pursue engineering after high school, the PLTW Engineering program provides opportunities to develop highly transferable skills in critical thinking, collaboration, and problem solving, which are relevant for any coursework or career.

U.S. News STEM Solutions Summit, 2012; Infographic: The Math-Science Shortage, Getting Smart, 2011; U.S. Census Bureau, “Disparities in STEM Employment by Sex, Race, and Hispanic Origin”, 2013

PLTW Engineering Curriculum

Foundation Courses

- IED Introduction to Engineering Design / year**
Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3-D modeling software and use an engineering notebook to document their work.
- POE Principles of Engineering / year**
Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of structures and materials, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation.

Specialization Courses

- AE Aerospace Engineering / year**
This course propels students' learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics using industry-standard software. They also explore robot systems through projects such as remotely operated vehicles.
- CEA Civil Engineering and Architecture / year**
Students learn important aspects of building and site design and development. They apply math, science, and standard engineering practices to design both residential and commercial projects and document their work using 3-D architecture design software.
- CIM Computer Integrated Manufacturing / year**
Manufactured items are part of everyday life, yet most students have not been introduced to the high-tech, innovative nature of modern manufacturing. This course illuminates the career opportunities related to understanding manufacturing processes, product design, and robotics.
- CSE Computer Science and Software Engineering / year***
CSE opens doors to careers in computer science. Students develop computational thinking as they create apps for mobile devices, automate tasks in a variety of programming languages, and find patterns in data. CSE aligns with the AP Computer Science Principles course.
- DE Digital Electronics / year**
From smart phones to appliances, digital circuits are all around us. This course provides a foundation for students who are interested in electrical engineering, electronics, or circuit design. Students study topics such as combinational and sequential logic and are exposed to circuit design tools used in industry, including logic gates, integrated circuits, and programmable logic devices.
- ES Environmental Sustainability / year**
In ES, students investigate and design solutions in response to real-world challenges related to clean and abundant drinking water, food supply issues, and renewable energy. Through hands-on activities and simulations, students research and design potential solutions to these true-to-life challenges. ES replaces Biotechnical Engineering, which PLTW will continue to support through the end of the 2016-17 school year.

Capstone Course

- EDD Engineering Design and Development / year**
The knowledge and skills students acquire throughout PLTW Engineering come together in EDD as students identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of practicing engineers. Students apply the professional skills they have developed to document a design process, and they complete EDD ready to take on any post-secondary program or career.

*PLTW Computer Science program foundation course.