



Project Lead The Way Propels Young Learners to New Heights

Third graders Emma and Justin are engrossed in a challenging hands-on project. Using an array of robotics components, they are assembling a device designed to lift and rescue a fictional zoo animal that is trapped. Applying the knowledge of simple machines they learned through Project Lead The Way's PLTW Launch™ curriculum, they are creating solutions to tackle this problem. Around the room, a variety of crane-like structures are taking shape as students bring their designs to fruition, using the mechanical advantages of levers, pulleys, wheels, and axles to attempt a rescue. A wheel and axle together is one of the simple machines they investigate.

Not every design will succeed. Learning how to assess a problem, apply knowledge, devise a potential solution, and then improve upon that solution are what is most important as these young students gain valuable perspective and insights that come from hands-on experience. PLTW Launch is a highly engaging and fun way for K-5 students to learn, paving the way for increased confidence and future success in all kinds of academic pursuits.

Learning Through Exploration and Discovery

Through the PLTW Launch curriculum, students in kindergarten through fifth grade become hands-on problem solvers. In a series of grade-appropriate activities, projects, and problems, students employ critical thinking and use structured approaches, like the engineering design process and scientific method. They learn to take intellectual risks and make mistakes. Furthermore, the technology tools used in PLTW Launch support and enhance the learning process, facilitate the development of spatial skills, and unleash student creativity.

Transforming Teacher Experiences

Two Wisconsin school districts – Kenosha and Ashwaubenon – are at the forefront in implementing the program in their schools, with great success. PLTW Launch Master Teacher Airielle Hodges, a third grade teacher in Kenosha, and PLTW Launch Master Teacher Corey Hansen, a library media specialist in Ashwaubenon, are strong advocates. Both have been instrumental in training other teachers, integrating modules within the science curriculum, and expanding the program in their schools.

“I love teaching PLTW Launch,” Hodges says. “I was excited to pilot this curriculum because I love teaching science and I was intrigued by the problem-based approach to learning.”

When the call went out for teachers to initiate the program, Hodges volunteered and went to Indianapolis for training as a Lead Teacher; since that time, she has become a Master Teacher and instructs other elementary educators at various Project Lead The Way affiliate colleges and universities.

As Lead Teachers, Hodges and Hansen conduct in-person Building-Level Readiness Training for others at their schools and serve as key resources for PLTW Launch-related activities. After the initial instruction, all PLTW Launch teachers engage in Core Training, accessed through the myPLTW Learning Management System (LMS) online portal. Through this self-paced e-learning, teachers review activity-specific overviews and instructional best practices. Teachers also receive access to the National PLTW Launch Professional Learning Community (PLC), module-specific student and classroom instructional resources, and Ongoing Training resources through the LMS.



“Being a Lead Teacher is difficult but rewarding,” Hansen says. “It involves training other classroom teachers, supporting them in their planning, and providing assistance as needed. I also work with our administrator to roster the teachers and students, as well as put together purchase orders for materials and manage those supplies. Our administrator has been very supportive with giving time to teachers to plan their new modules. That has allowed our teachers to prepare lessons, get into the LMS, create their classes, and feel more confident when they begin their instruction.”

Getting an Early Start: A Springboard for STEM Success

Academic research emphasizes the value and importance of developing spatial skills in science and engineering – and the younger those skills are learned by girls as well as boys, the easier those students will gain mastery. A 2006 paper presented by professors Sheryl Sorby, Thomas Drummer, and Raymond Molzon of Michigan Technological University states it succinctly:

“It is well documented that (3-D) spatial skills are critical to success in engineering and technological careers. It is further well established that the spatial skills of women typically lag behind those of their male counterparts, thus presenting women with a barrier to success in the male-dominated field of engineering.”

Spatial skill development is an integral part of the PLTW Launch curriculum, bolstered by student use of the Autodesk® Inventor® Publisher and I23D® Design apps. The apps and hands-on activities not only facilitate learning, but also accelerate students’ understanding of spatial concepts.

“Inventor Publisher Viewer is an amazing app that we use for all of the modules that require VEX IQ® robotics kits,” Hansen says. “When we started piloting the curriculum, students initially built from printed directions. It worked well enough, but when the Inventor Publisher files became available to use onscreen, we could really see a difference in the students’ understanding of 3-D concepts. The files are dynamic and movable, and can be zoomed in on and viewed from any angle. That makes it much easier for kids to grasp what they’re trying to do. The motion assembly segments are unbelievable, and they can be viewed over and over or paused by students while they work.”

Supporting Learning Through Virtual and Hands-On Experiences

Hodges speaks highly of how the hands-on activities and technology work in tandem to aid student learning.

“All PLTW Launch modules follow the activity-, project-, and problem-based approach to learning, which is highly engaging for students as they are taken through the design process. When using software, students begin to think like an engineer as they follow a step-by-step approach to solving a problem – and just like an engineer, they propose a solution to develop after evaluating multiple possible designs.

“In third grade, we teach a module called *Stability and Motion* with a focus on the science of flight,” she continues. “In this module, students need to design a glider that can carry the most ‘cargo’ a certain distance. Each child first sketches his or her glider in a PLTW Launch log. Then the students use the Autodesk I23D Design app to virtually design their gliders during the ‘model’ phase of the engineering design process. It is a very visual tool for the kids – they get a clear picture of how the wings will look before the glider is actually built. The software allows them to view several design options, compare them, and analyze the features and benefits of different types of wings.”

Elevating Learning Through Engagement

Both teachers marvel at their students’ engagement level.

“Students love using the apps,” Hansen says, “and some of them put I23D Design and other apps on their devices at home once they know what they are. They are really engaged while they work on learning about flight, robotics, and the physics of collisions, thanks to the tools that they enjoy using.”

Hodges concurs.

“I am amazed to see how engaged all of the students are when they are doing a PLTW module,” she says. “Students are able to think like an engineer at a very young age. It is very gratifying to see the students using problem-solving skills and collaborating on their own. They learn how to work together and create a design that is the best solution to a problem, even if it isn’t their own idea. Students realize that their first idea might not always work, but they can keep going back to make changes. They are able to compare multiple solutions to a problem and select one to develop collaboratively. ... It is amazing what these young kids are doing!”





About PLTW

Project Lead The Way (PLTW) is a 501(c)(3) nonprofit organization and the nation's leading provider of K-12 science, technology, engineering, and math (STEM) programs. PLTW's world-class, activity-, project-, and problem-based curriculum and high-quality teacher professional development, combined with an engaged network of educators and corporate partners, help students develop the skills needed to succeed in our global economy. More than 6,500 elementary, middle, and high schools in all 50 states and the District of Columbia currently offer PLTW courses to their students. For more information, visit www.pltw.org

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