



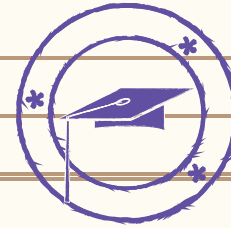
## CURRICULUM INSIDER:

Proven Ways to Create  
Your School's Most Effective  
Engineering Program

*Why combining SolidProfessor with Project Lead the  
Way curriculum results in higher achieving students  
— and could even earn money for your school*

AUTHOR: SolidProfessor

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## Why Two Tools Are Better Than One

*"I already have Project Lead the Way — I don't need anything else to teach my students about engineering."*

Humans have an innate desire to find one solution to fix every aspect of a complex problem. But very rarely is there a single tool or a one-size-fits-all method. There's no magic dieting pill, there's no perfect path to professional success, and there's no one platform that'll teach your students everything they need to know about engineering design.

### FIND THE RIGHT SOLUTION RATHER THAN THE CONVENIENT ONE

Teachers across the country have found that using Project Lead the Way's (PLTW) engineering curriculum and SolidProfessor's online engineering training videos provide their students with the most all-encompassing, hands-on engineering education. We'll go over three specific areas where PLTW and SolidProfessor work together to ensure you get the most out of your engineering curriculum:

- Earning industry certifications
- Preparing students for real-world engineering jobs
- Providing educators with professional development

We'll also provide advice from fellow educators about how to implement this two-pronged approach to engineering education.



### Apply It with Cliff Greer


High school engineering teacher Cliff Greer uses both PLTW and SolidProfessor in his classroom. Greer's insights, which you'll find throughout this paper, stem

from eight years of teaching engineering at the high school level. He also has a degree in engineering and spent a few years in the workforce before turning to the teaching side.

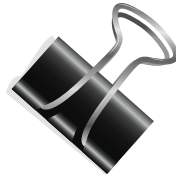
**Background with PLTW:** Greer's high school was one of the first to try PLTW, and they've become a magnet school for it. Now, PLTW has expanded to Greer's entire district.

**Accomplishments:** Greer is a master teacher in engineering and computer science, sharing his knowledge by training other faculty members. Based on the success of his engineering program, PLTW presented him with the 2018 Outstanding Teacher Award for engineering.

**Apply it:** Greer uses PLTW and SolidProfessor to provide students with a robust engineering curriculum. Students leave the program with industry-ready skills and the know-how to excel at the postsecondary level and in the workplace. Keep an eye out for his "Apply It" tips throughout this paper.



*Industry Readiness:  
Teach Students the  
Software Skills They'll  
Need to Excel in College  
and the Workplace*



When engineering students join the workforce, employers expect them to dive into their CAD software program and start creating. Right. Now. Even when your students move on to the postsecondary level, most engineering curricula expect students to know how to navigate design software when they start the degree program. With PLTW and SolidProfessor, your students get the software-specific instruction that'll set them up for a successful future in engineering design.

### **ACTION PLAN: PROVIDE STUDENTS WITH SOFTWARE-SPECIFIC INSTRUCTION**

You know you need to teach your students how to navigate engineering design software. But what do your students really need to learn? How do you incorporate software-specific instruction in the classroom? PLTW and SolidProfessor make it easy to plan projects and create lessons that focus on increasing your students' software proficiency.

### **HOW IT WORKS WITH PLTW AND SOLIDPROFESSOR**

PLTW is most known for introducing engineering principles and critical thinking concepts through hands-on projects. PLTW starts to incorporate Autodesk Revit into the sixth- to eighth-grade curriculum, and students learn how to use this architectural design tool for specific projects. In the PLTW engineering curriculum for grades 9-12, students start navigating engineering design software Autodesk Inventor to complete projects. Again, the lessons focus on completing a project, rather than teaching students specifically how to navigate the software platforms.

SolidProfessor fills that gap through its online training videos. The educational videos dive into the details, providing the step-by-step instructions for how to design in the most efficient way possible. They also explain the "why" behind the techniques, encouraging students to think about the entire design process, rather than just memorizing rules for a few specific projects.

### *Why teach software-specific skills?*

*CAD software is like the Microsoft Office of engineering design — students are expected to be able to navigate these programs, and if they don't have those skills, they're going to struggle to complete even basic assignments.*

In the [SolidProfessor Library](#), you'll find thousands of hours of educational videos for each of the most popular CAD, CAM, and BIM programs used in postsecondary institutions and companies across the country. Whether you want to supplement the instruction on your Autodesk products or you want to branch out to additional software programs, SolidProfessor is here to support you.

## WHAT DOES SOFTWARE-SPECIFIC TRAINING LOOK LIKE IN THE CLASSROOM?

Every educator approaches their software-specific training a little differently depending on how advanced their students are or how much class time is available. We've provided a few different models to help you lock down your unique approach.

### THE FLIPPED CLASSROOM

**What it is:** Students learn new concepts on their own by watching online videos, reading articles, and/or engaging in online discussion groups. Students then apply that knowledge by completing in-class assignments with the teacher facilitating and guiding them.

**How to do it:** Students watch SolidProfessor videos on their own time to learn how to use the software. Then, their knowledge is tested through in-class assignments. Throughout the in-class work, the teacher is available to provide more direction, answer questions, and clarify issues. If the educator sees any particularly weak areas,

they can provide more instruction during class time or assign additional SolidProfessor videos for students to review at home.

**Tip:** Not ready to commit to the full flipped classroom model? [Start small with these seven tactics.](#)

### Apply It:

*"So many people in the industry — especially in our area — say that they still want their interns and entry-level people to use AutoCAD. So, we use SolidProfessor to teach students how to use AutoCAD. Now, our juniors can start internships that require AutoCAD experience. They're going out and doing real work right out of high school." — Cliff Greer*

### THE PROJECT-BASED MODEL

**What it is:** Students work on a project over an extended period of time that challenges them to investigate a multifaceted problem and gain new knowledge to solve it. Effective projects pose a real-world question or issue, and students must complete extensive research to form their solution. They can reflect on their decisions, present their solution, and receive constructive criticism.





**How to do it:** Teachers plan out which PLTW activities to assign to students — or they create their own projects. Students are given access to SolidProfessor videos to help them research the problem and learn how to execute their solution.

**Tip:** This model is great on a project-by-project basis, but it doesn't typically work on smaller assignments that have one, set solution. These need to be thought-provoking projects that require extensive research.

### THE TRADITIONAL APPROACH

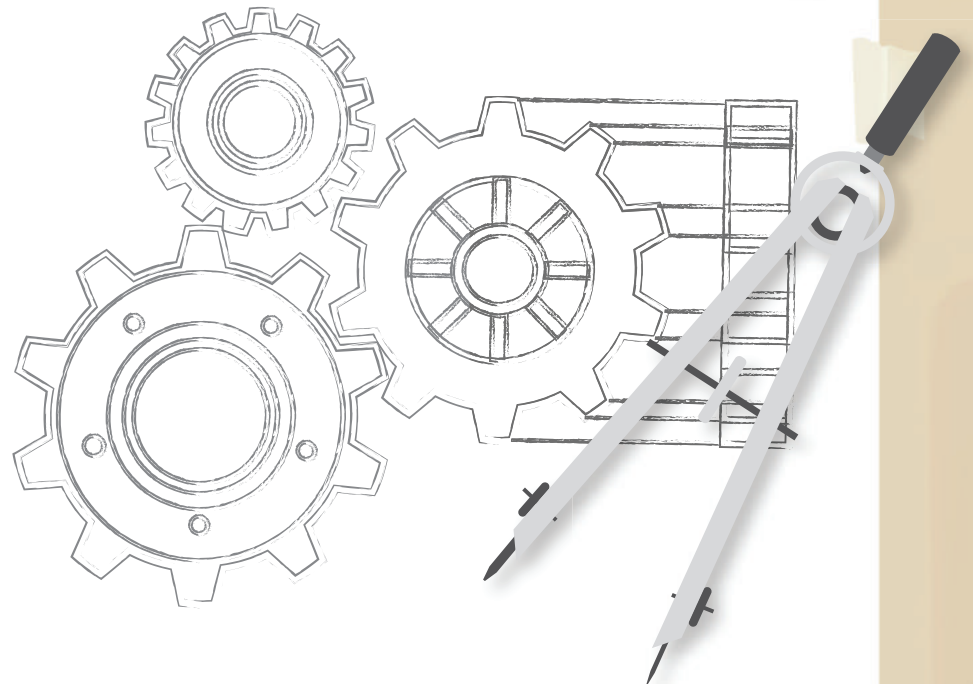
**What it is:** During class, teachers introduce new concepts through lectures and presentations. Students complete assignments at home that reinforce those concepts.

**How to do it:** Teachers create presentations using a blend of lecturing and showing SolidProfessor videos. This ensures that students learn about engineering theory as well as how to use their design software. Then, students complete PLTW activities at home.

**Tip:** It's really tough to make the traditional approach the default when working with PLTW. PLTW's curriculum lends itself to a flipped classroom, with assignments meant to be completed in small groups during class time. Teachers have shared that if their students really struggle with a particular concept, they might switch to a traditional model for a lesson or two to provide more instruction on that topic.

### Cost-saving tip:

*Looking to teach another software outside of Inventor? Many CAD software programs offer their platform at a discounted rate — or free — to schools. If you can't figure out how to get a discounted rate for a particular CAD software, call SolidProfessor's team of academic experts at 619-269-8684, and they can point you in the right direction.*





## *Industry Certifications: Showcase Your Students' Real-World Expertise*



Many teachers don't pursue certification for their students because they mistakenly think that the material is much too advanced for their class. But with software-specific lessons, support from teachers, and great exam preparation, students can pass certification exams.

### **ACTION PLAN: GET STUDENTS CERTIFIED IN AN ENGINEERING DESIGN PLATFORM**

Getting certified is an achievable goal for students — plus, it benefits schools, teachers, and the students themselves. But the real question remains: how do you get your students to operate at such a high level of competency in complicated software programs?

#### **HOW IT WORKS WITH PLTW AND SOLIDPROFESSOR**

Through PLTW, your students get an opportunity to dabble in Autodesk Revit and Autodesk Inventor. They can see how these platforms fit into their larger projects, and they gain some proficiency. This is valuable background knowledge to have going into the certification preparation process.



When your students are ready to start preparing for the certification exam, SolidProfessor's courses teach them exactly what they need to know to ace the test. Whether you're using Autodesk or another CAD, CAM, or BIM platform, SolidProfessor likely has a certification preparation course for you. Cert prep courses provide students with

- The exam format
- The types of questions to expect
- Instruction on how to approach each of the exam's topic areas
- Practice exams to ensure your students are ready for the real thing
- Directions on how to register for the exam

SolidProfessor also offers free exam vouchers for some of the most popular certification exams. When your students complete the SolidProfessor cert prep course, they can get a voucher to take the certification exam for free.

### *Cost-saving tip:*

*Your school might actually be able to make money by getting your students certified. Many states across the U.S. provide teacher bonuses and cash incentives based on how many students pass approved certification exams. It's a win-win-win situation.*

## WHAT DOES CERTIFICATION PREPARATION LOOK LIKE IN THE CLASSROOM?

Now, it's time to start planning the cert prep process! Most schools opt to start certification preparation in high school, but middle schools across the country have started getting students certified, as well. Because PLTW doesn't include certification prep in their classroom curriculum, you can either set aside class time for cert prep with SolidProfessor or encourage your students to complete the SolidProfessor assignments on their own.

### Why get your students certified?

*Having an industry certification opens up more opportunities for your students after school, from giving them a competitive advantage over their peers to strengthening their software skills and enhancing their resume.*

### Apply It:

*"What we do in class doesn't give students enough software-specific instruction to pass the certification test. So, we spend at least a month and a half preparing specifically for the exam using SolidProfessor's online videos. Students need to score over an 80 on SolidProfessor's practice test before they are allowed to take the certification exam."*

— Cliff Greer

## PROGRAM OVERVIEW

The goal is to thoroughly prepare students for their certification exam while giving them the skills to be successful at the postsecondary level and in the workplace.

SolidProfessor's certification prep course teaches them how to navigate each aspect of the software that'll be covered in the exam.

Certification prep reinforces engineering concepts introduced in previous PLTW curricula and prepares students to better leverage their CAD, CAM, or BIM software program.

After the cert prep course, students will be fully prepared to pass the certification exam.

## PREREQUISITES

PLTW Gateway (optional): While not necessarily required, PLTW Gateway introduces students to design software, giving students a leg up when they approach cert prep.

SolidProfessor's introductory courses (optional): Students should also consider taking SolidProfessor's introductory courses before they launch right into cert prep. Whether you're using Inventor, Revit, AutoCAD, SOLIDWORKS, or another CAD, CAM, or BIM software, students will catch on to the cert prep material much quicker if they have the right foundational knowledge.

## LESSON PLANNING

When students have a working knowledge of how to navigate the software, start preparing for the certification exam. Set aside about 20-30 minutes of class time for students to watch videos, complete assessments, and ask questions. It's recommended that students prepare for the exam for at least a full semester.

A few weeks before the exam, have students take SolidProfessor's practice test to get a good feel for how well they know the material. Set a score they must achieve to be able to take the certification exam.



## Professional Development: Cultivate an Engaged, Informed Teaching Force

When talk turns academic, it usually centers around students. In the clamor to make the educational experience better for students, teachers are often left out of the conversation. But teachers need support, too. And with SolidProfessor and PLTW, you gain access to year-round training and a community of engineering professionals. Through these opportunities, you can enhance your resume, gain a much deeper understanding of engineering design, and learn new software techniques in the process.

### ACTION PLAN: ENHANCE YOUR YEAR-ROUND PROFESSIONAL DEVELOPMENT

You've likely had to attend a conference or two in your day. Maybe you've been to a staff development seminar, an in-service, training, or continuous education event. These are all just terms for professional development. While some schools do provide professional development or continuous learning opportunities, they're often not course-specific, and they aren't available anytime, anywhere. And, when school budgets shrink, professional development tends to be the first to go. So, how do you gain access to year-round professional development?

### Cost-saving tip:

There are thousands of grants available to help fund professional development for teachers. Some grants give teachers access to technology-based education, while others fund travel opportunities and more. [Check out this full list of professional development grants for teachers.](#)



### HOW IT WORKS WITH PLTW AND SOLIDPROFESSOR


PLTW provides in-depth training for teachers through in-school training events held during the summer. Throughout the year, PLTW provides educational tracks for each of their courses. In short, PLTW training provides educators with the tools to successfully teach the PLTW curriculum, an incredibly helpful offering.

While PLTW provides training specific to the curriculum, SolidProfessor covers industry-related training. Teachers need to have a firm understanding of how to navigate their CAD, CAM, or BIM software, and SolidProfessor videos are a quick and convenient way to increase competency. Because the entire Library of courses is available online, you can learn anywhere, anytime. Have an unexpected free period? Proctoring a test? These are perfect opportunities to learn new skills, like how patterning can increase design efficiency in 2019 Inventor. You don't have to block off hours of your time — you can simply view videos when you have a spare 10-20 minutes.

### *Why focus on professional development?*

*Not only are educators required to attain a certain number of continuing education credits to keep their teaching license, but it's also a great way to mitigate burnout and ensure new educators have the tools they need to be successful.*





## Technology Grant Program: Access SolidProfessor's Library at a Fraction of the Commercial Cost

Through the Technology Grant program, SolidProfessor provides schools access to its Library of online courses for up to 90% off the commercial price. Classrooms, schools, and school districts across the country have leveraged the Technology Grant to provide in-depth engineering design training to their students.

SolidProfessor recognizes that budgets are tight in schools and is committed to making engineering training resources accessible to every educational institution. Hear why fellow educators took advantage of the Technology Grant to revolutionize their engineering programs:

*"SolidProfessor is the bridge that closes the gap between PLTW projects and the software applications used to complete those projects. The software learning curve would have been steep, and my students would have been frustrated without SolidProfessor." — Juan "JJ" Teyssandier, Stranahan High School Engineering Teacher*

*"SolidProfessor gives my students a great foundation. They get to understand and utilize what they're learning in a real-world setting. I love the program. The ability to differentiate my students frees me up to move around the room and give my students individual assistance." — Adam Mack, W.R. Thomas Middle School Teacher*

*"Since SolidProfessor is online, our teachers can utilize the videos to learn in the summer, before or after school, or during their planning periods. When you break out the costs of [in-person training], we easily saved close to \$20,000." — John Crow, Career and Technical Education Specialist at Katy Independent School District (Katy ISD)*

### CONTACT SOLIDPROFESSOR ABOUT THE TECHNOLOGY GRANT

Find out how SolidProfessor's Technology Grant can benefit your classroom and your school. Simply contact the SolidProfessor academic team for more information and to get a free demo.

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