



PROJECT LEAD THE WAY

PLTW.





Project Lead The Way is the nation's leading provider of science, technology, engineering, and math (STEM) curriculum for middle and high school students.



Our mission is to **prepare**
students for the **global economy.**

Why PLTW? Why now?

The United States ranks 17th in science achievement; 25th in math ability out of 65 countries.¹

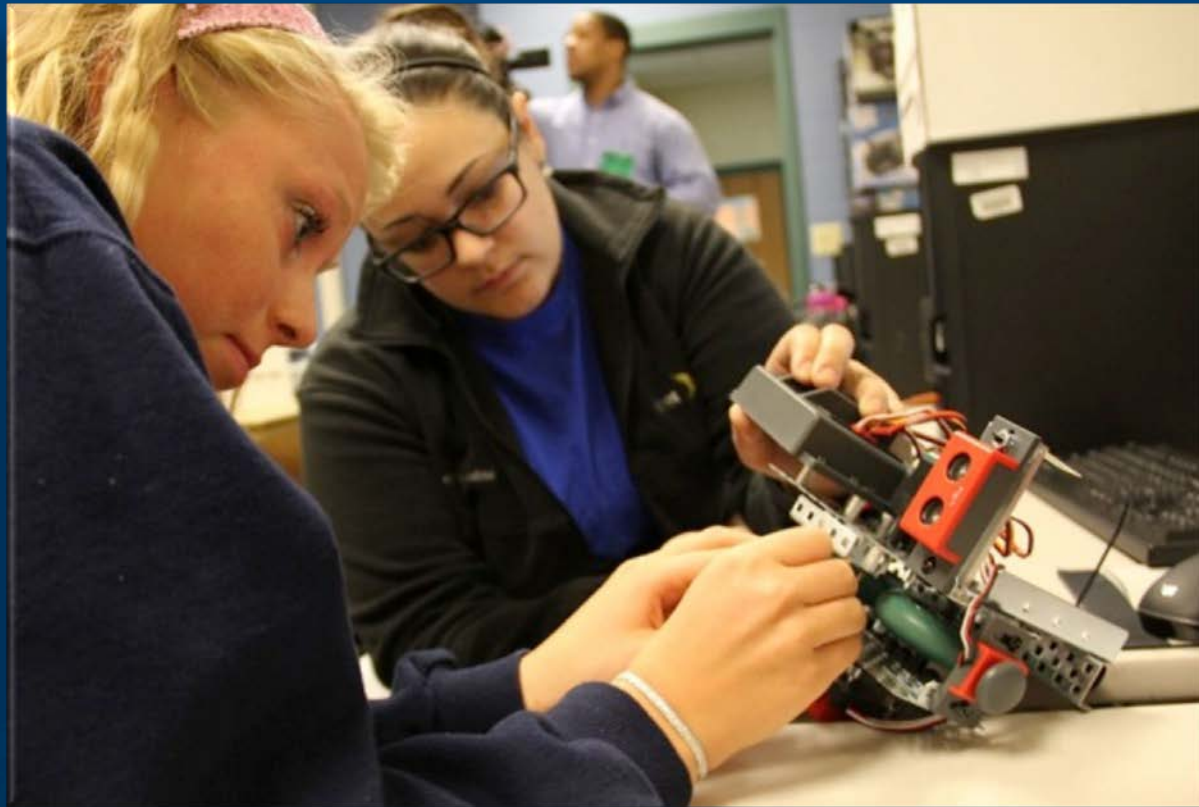
By 2018...

- STEM jobs will grow by 17 percent²
- 1.2 million STEM jobs will go unfilled³



How do we prepare students to have the **right skills** and the **right interests** to fill those 1.2 million jobs and **close the United States' skills gap?**

Engage their **minds** and
their **interest** early..



...through rigorous, relevant learning.





It's what Project Lead The Way does on a regular basis.

We engage students' minds while inspiring their interest in STEM subjects through hands-on learning and real-world problem solving.

Here's how.

Preparing Students For the Global Economy

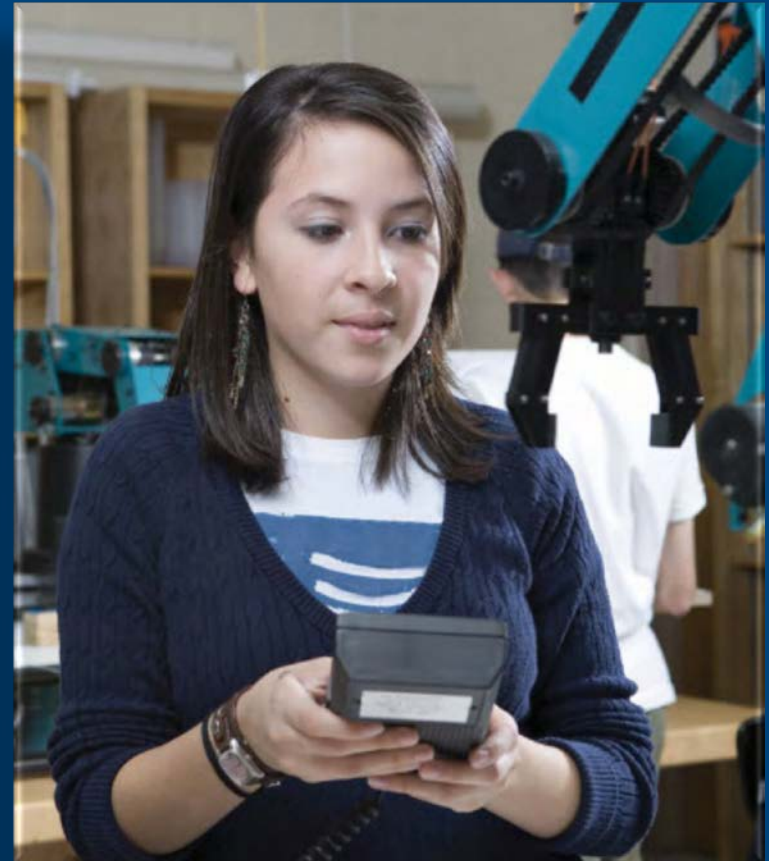


- LEADERSHIP • INNOVATION
- CONTINUOUS IMPROVEMENT
- ACCOUNTABILITY

World-Class Curriculum

Our curriculum is designed and consistently reviewed and improved by:

- PLTW teachers
- University educators
- Industry experts
- School administrators



World-Class Curriculum

- All PLTW curriculum is activities-, project-, problem-based.
- PLTW curriculum aligns with Common Core State Standards and Next Generation Science Standards.





Teacher serves as facilitator, student is director of learning...



... and the classroom becomes a collaboration space

PLTW's curriculum creates a **classroom experience unlike any other.**

Where students learn content in context through:

- Case-based scenarios
- Hands-on learning
- Activities, projects, and problems
- Real world application
- Open-ended problems



Project-based learning gives students:



- Hands-on, rigorous, relevant, real-world experiences
- The chance to use scientific sensors, Vex & ROBOTC, industry software (Revit, Inventor)
- Opportunities to be creative and solve problems
- The realization that there isn't just one right answer

World Class-Curriculum

**Elementary
School
Program**
*Launching in
2014*

**Gateway To
Technology**

**Pathway To
Engineering &
Biomedical
Sciences**

**College,
career,
and
beyond**



PLTW in Illinois

190 schools:

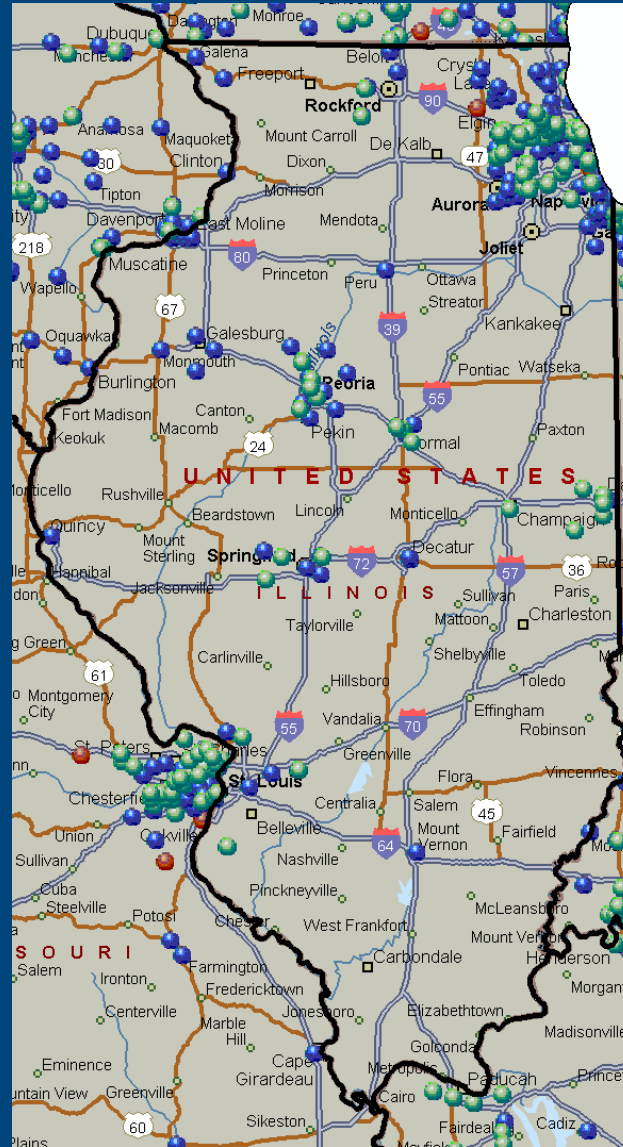
- 108 PTE/8 BMS

- 80 MS

- 34 new MS in 2012-13

+ 43 new programs for 2013-14

+ 3 elementary school pilot sites

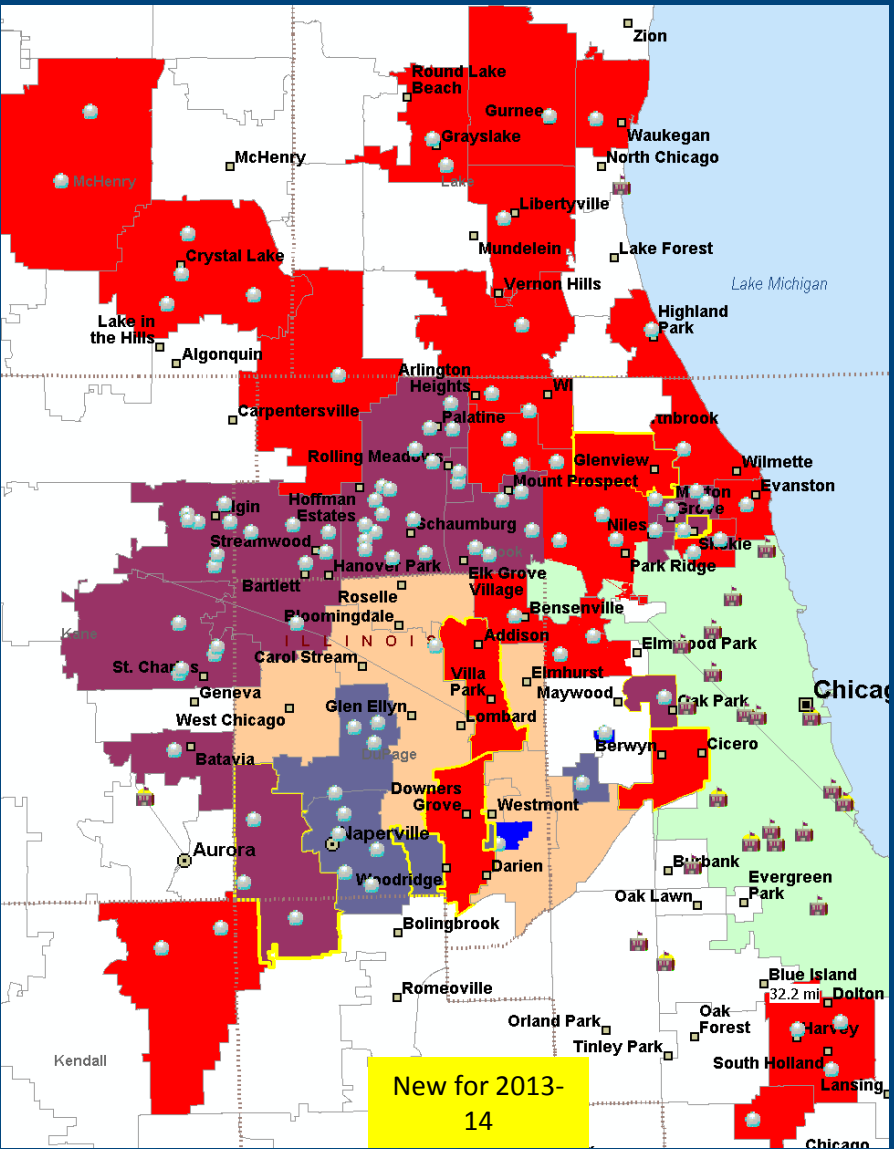


HS Students:
10,274

MS Students:
19,149

PLTW in the Chicago area

- Within 10 miles of MMS: 23 MS & 15 HS
- Within 20 miles, 48 MS & 42 HS
 - CCSD 59
 - River Trails
 - Mt. Prospect
 - Schaumburg CCSD 54
 - Township HSD 214
 - CUSD 200
 - U-46
 - Fenton
- Lake Park High School (2014-15)
- Tech Center of DuPage



Key	
PTE	
GTT	
PTE + GTT	
PTE at Voc Center	
PTE at VC + GTT	
Charter/Private/CPS	

PLTW elementary

Students decide as early as second and third grade whether they like, and think they are good at, math and science.

We need to reach them first.

PLTW elementary

Topic-based modules engage students in design problems, collaboration, analysis, problem solving, and computational thinking.

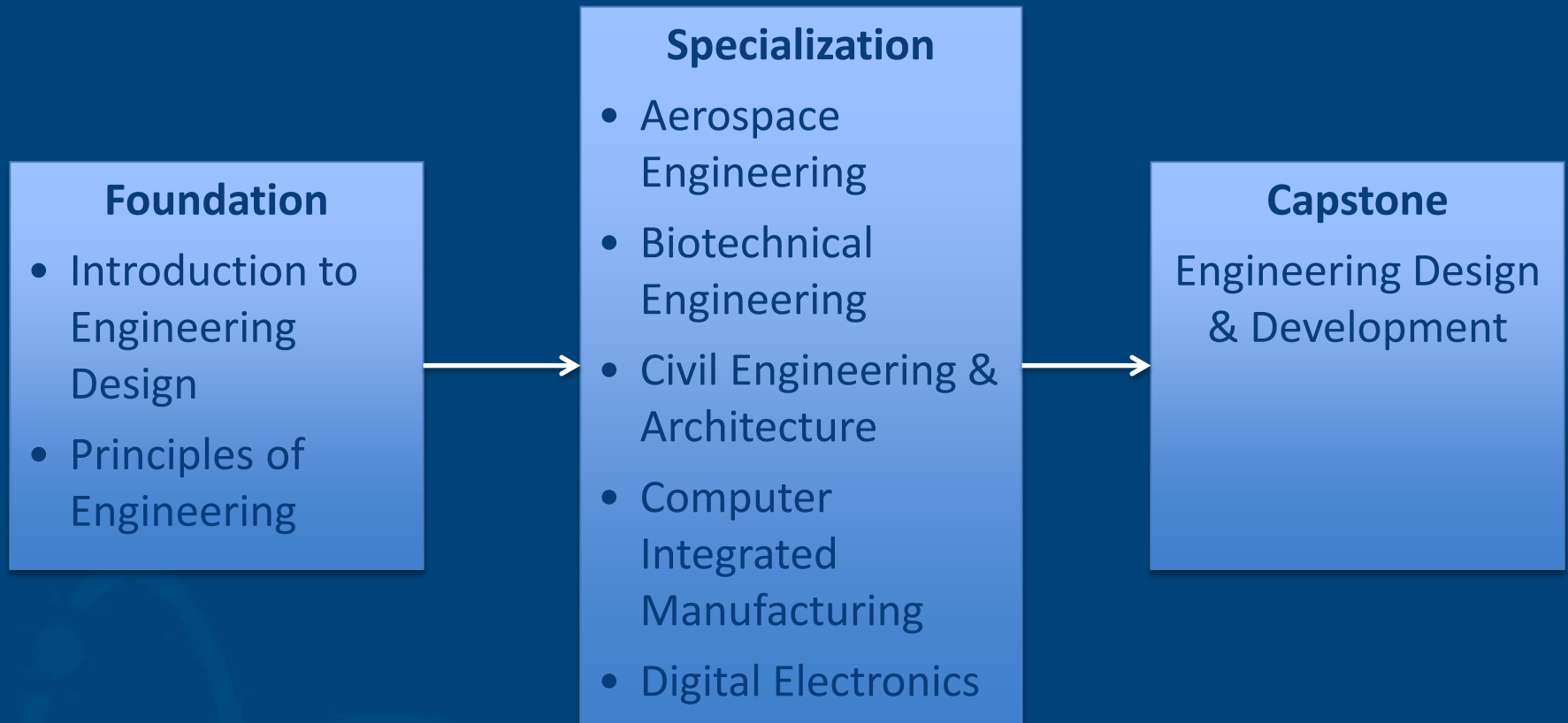


Pathway To Engineering

Collaborative, rigorous, and relevant, PTE students solve open-ended problems; learn and apply the engineering design process; and develop teamwork, communication, and critical thinking skills.



PTE Course Structure



Gateway To Technology

Challenging, inspiring, and flexible, GTT engages students' natural curiosity and imagination through creative problem solving.



Gateway To Technology units

9 week/45 day units designed for grades 6-8

Foundation Units

Design & Modeling

Automation & Robotics

Specialized Units

Medical Detectives

Flight & Space

Science of Technology

Energy and the
Environment

Green Architecture

Magic of Electrons

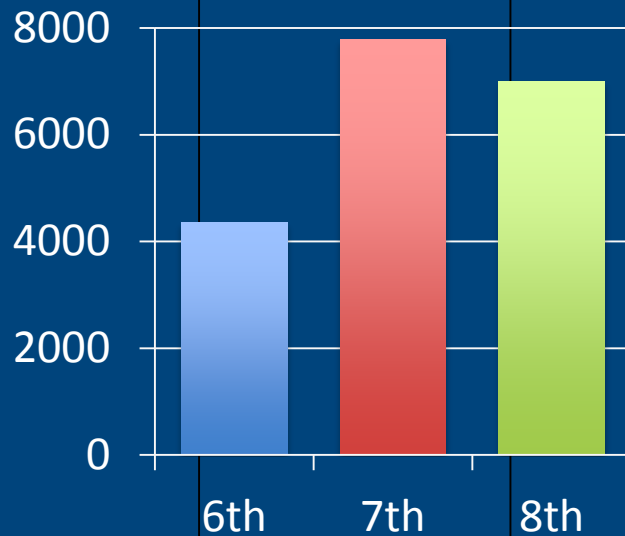
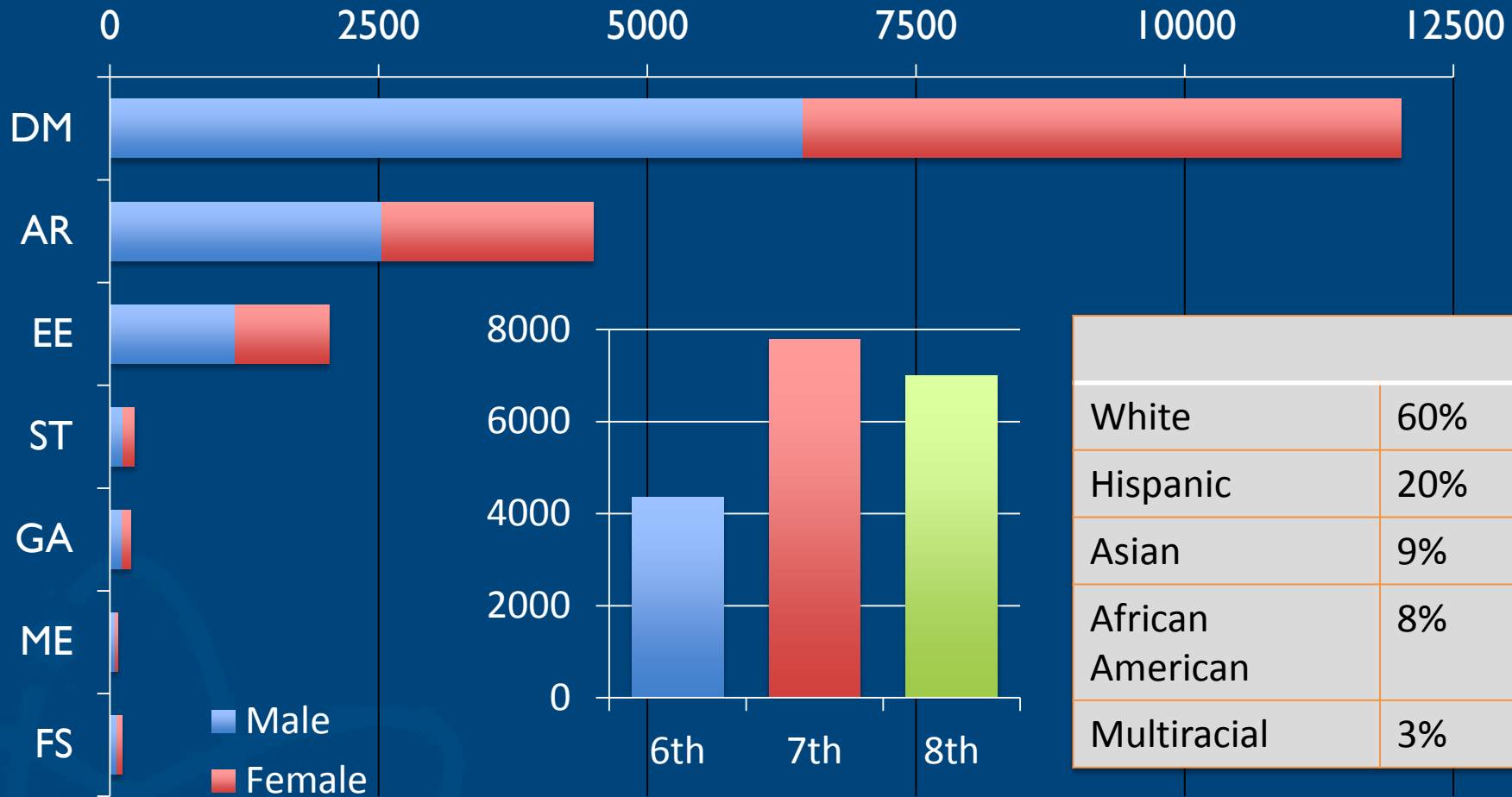
GTT foundation units

- Design & Modeling
 - Apply design process to solve problems
 - Work in teams to design a hobby organizer, furniture, new playground
 - Use Autodesk® design software to create virtual image of designs and produce a portfolio of solutions
- Automation & Robotics
 - Learn about mechanical systems, energy transfer, machine automation, and computer control systems
 - Use the VEX Robotics® platform to design, build, and program real-world objects

GTT specialization units

- **Energy and the Environment**
 - Design and model alternative energy sources and evaluate options for reducing energy consumption through energy efficiency and sustainability
- **Flight and Space**
 - Explore the science behind aeronautics; design, build, and test an airfoil
- **Green Architecture**
 - Study dimensioning, measuring, and architectural sustainability; design affordable housing units using Autodesk's® 3D architectural design software
- **Magic of Electrons**
 - Delve into electricity, the behavior and parts of atoms, and sensing devices; learn knowledge and skills in basic circuitry design and examine the impact of electricity
- **Medical Detectives**
 - Analyze genetic testing results to diagnose disease and study DNA evidence found at a “crime scene”; learn how to measure and interpret vital signs and diagnose diseases
- **Science of Technology**
 - Apply concepts of physics, chemistry, and nanotechnology to activities and projects including making ice cream, cleaning up an oil spill, and designing, building, and testing a new product

PLTW in Illinois: 2012-13 GTT Summary



White	60%
Hispanic	20%
Asian	9%
African American	8%
Multiracial	3%

19,149 students total

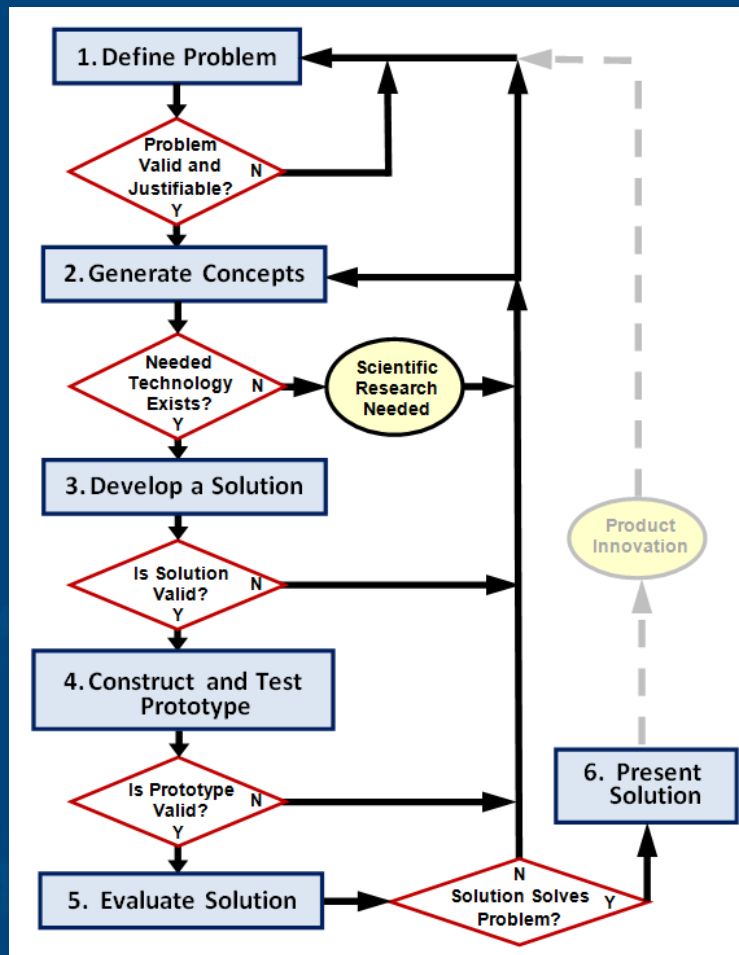
Inspiring, challenging, and flexible

How do Gateway To Technology students use the engineering design process to solve a problem?

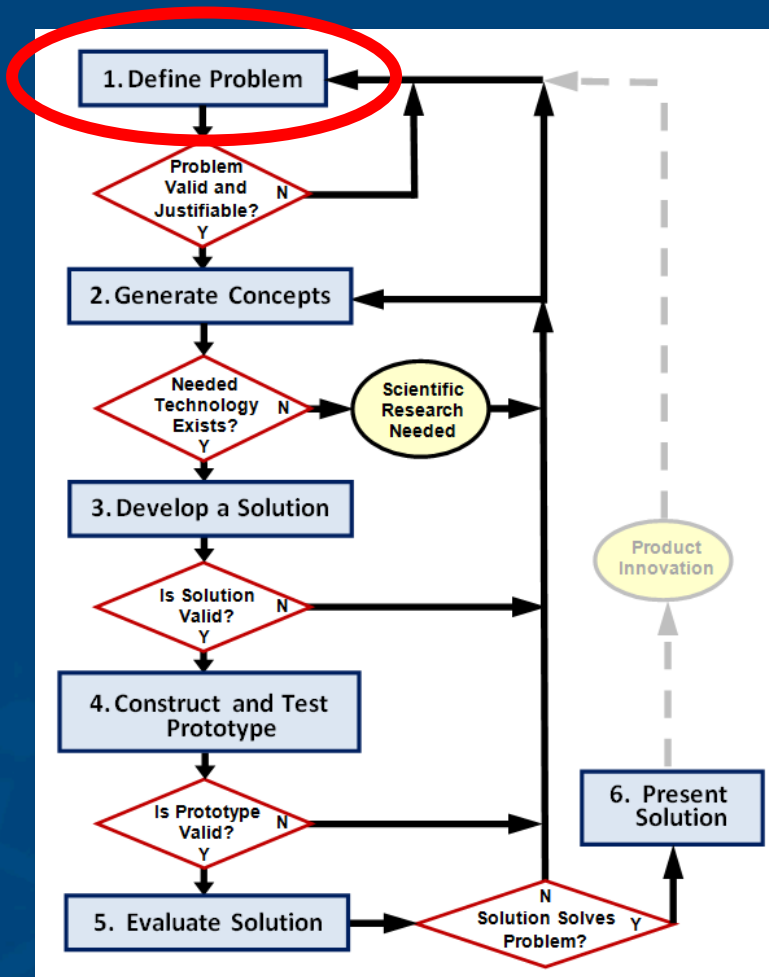


Students tackle the Playground Problem from the foundation unit Design & Modeling

Students use the design process to research, design, and model a playground



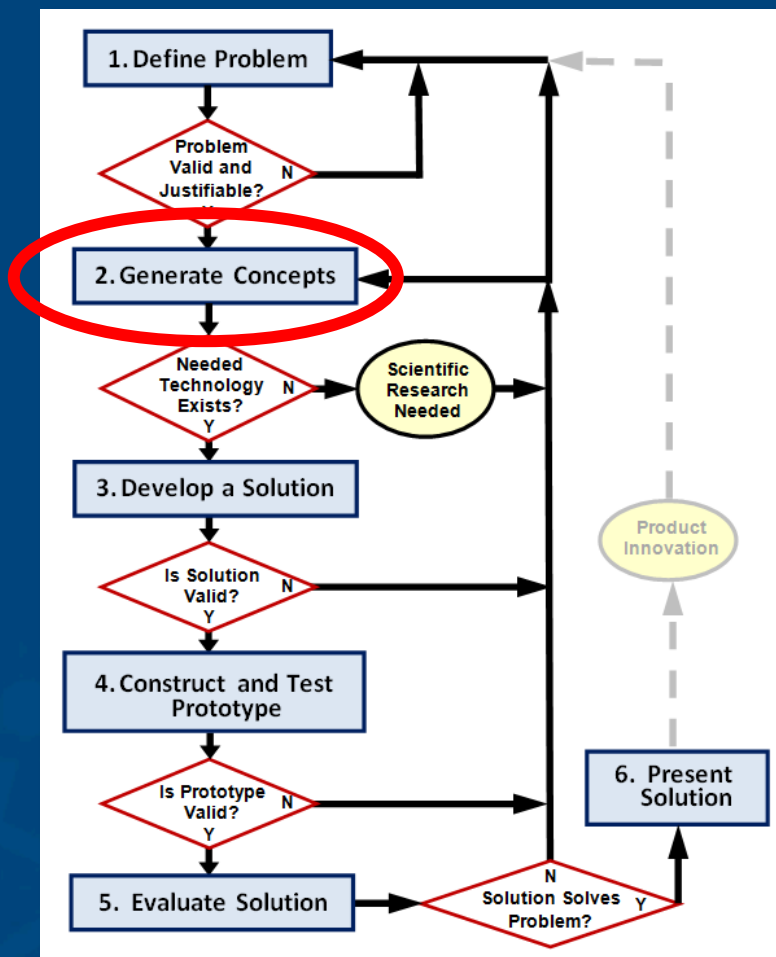
Define the problem



- Discuss playgrounds with community or school representative
- Visit and “play” on an existing playground
- Justify need for new or modified equipment playground

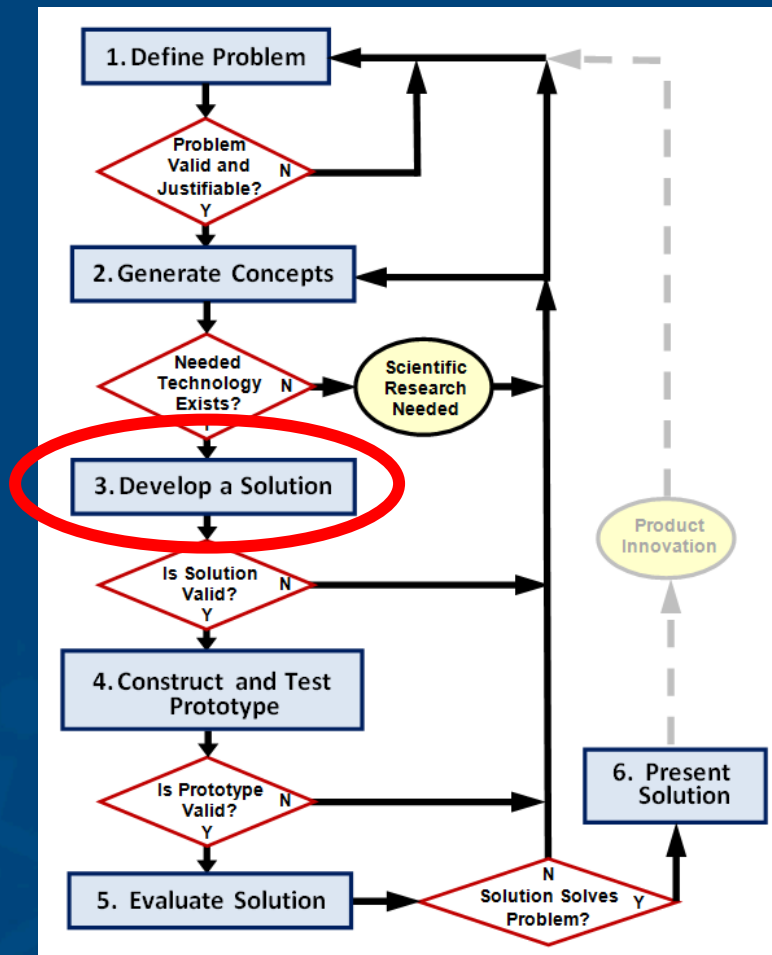


Generate concepts and conduct research



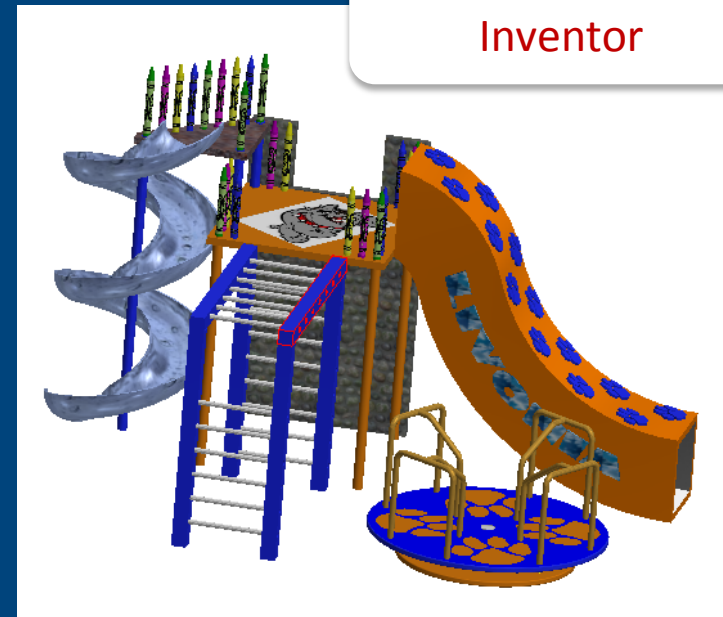
- Generate concepts
 - Brainstorm ideas/themes
 - Interview younger students
 - Sketch favorite piece of equipment
 - How to innovate?
 - Sketch new piece of equipment
- Conduct research
 - Safety
 - Size requirements
 - Materials
 - Longevity of use
 - Proper placement in playground

Develop a solution

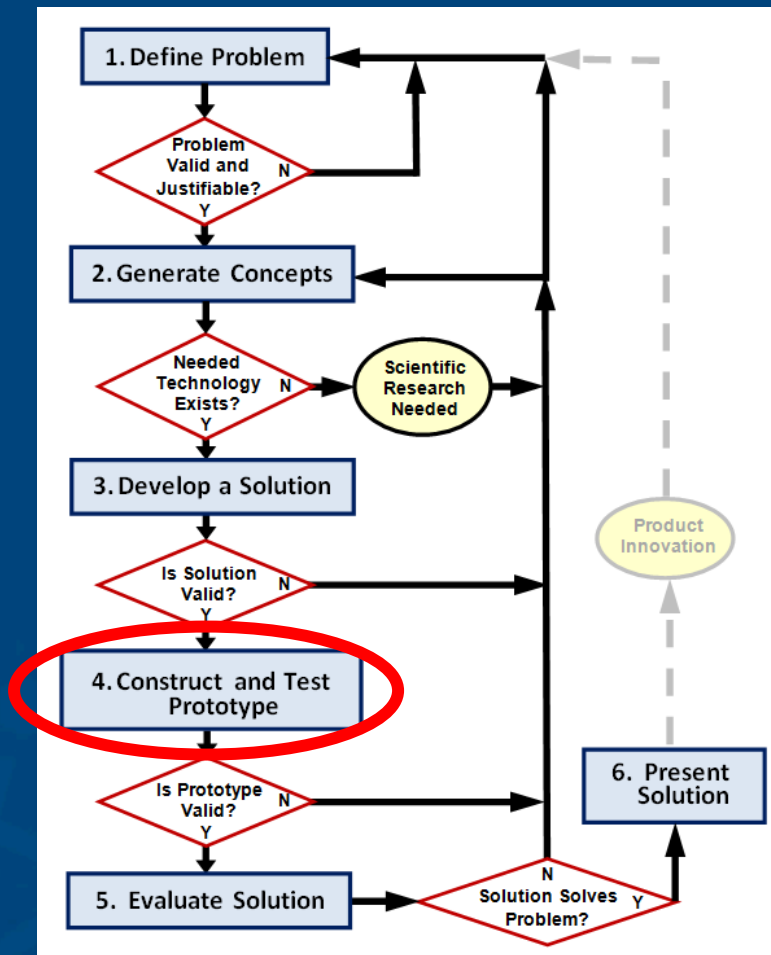


- Sketch in engineering notebook
- Create decision Matrix
- Use Inventor to develop 3D CAD drawings

Student work in Inventor



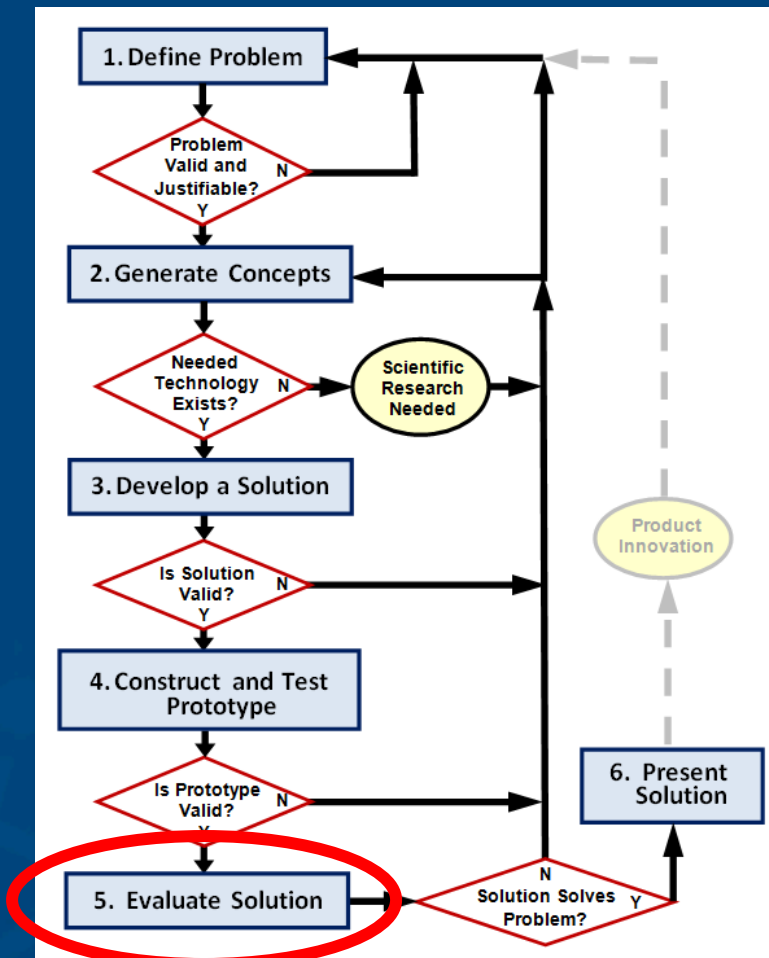
Construct and test model



- Build scaled model of playground design
- Requires new skillset and allows range of students to excel



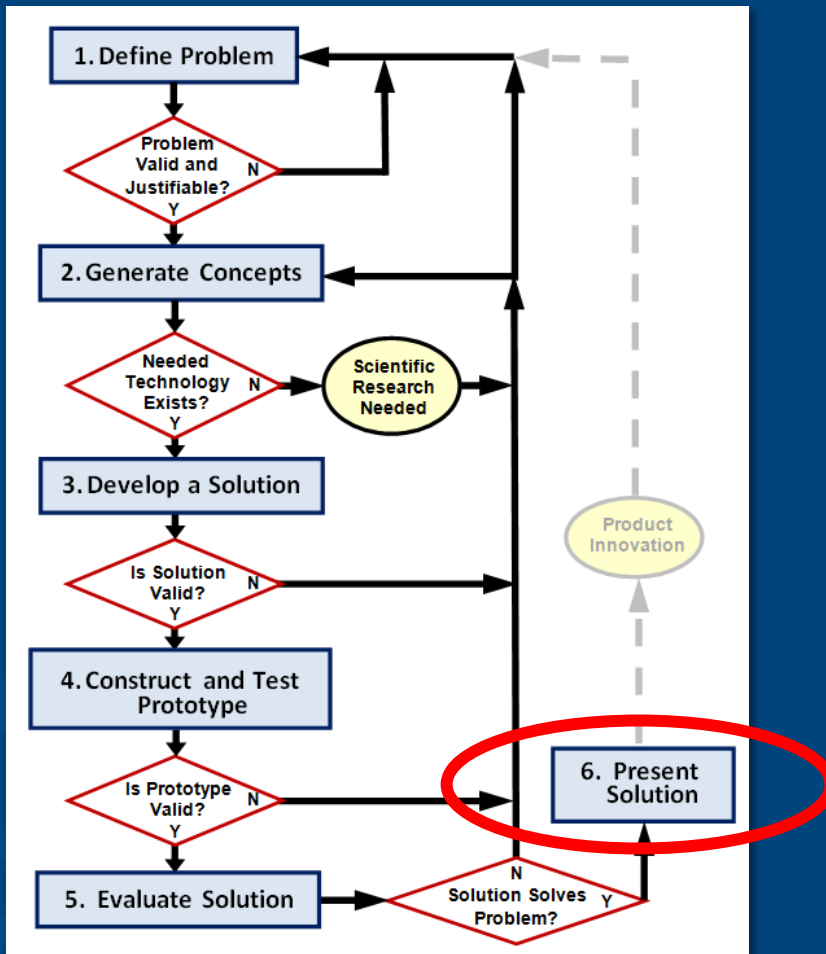
Evaluate solution



- Evaluate the fun factor and safety factor
- Assess material usage



Present solution



- Includes full team of students
- Explain problem, constraints, research, design, testing, and more to playground committee



GTT grows student interest in PLTW's advanced programs and STEM careers

Gateway To Technology Unit

Automation and Robotics

Design and Modeling

Energy and the Environment

Flight and Space

Green Architecture

Medical Detectives

Magic of Electrons

Science of Technology



Pathway To Engineering and Biomedical Sciences PLTW Courses

Principles of Engineering
Computer Integrated Manufacturing
Computer Science/Software Engineering

Introduction to Engineering Design

Biotechnical Engineering
Principles of Engineering

Aerospace Engineering

Civil Engineering and Architecture

Principles of the Biomedical Sciences
Human Body Systems
Medical Interventions
Biomedical Innovation

Digital Electronics

Biotechnical Engineering
Introduction to Engineering Design
Principles of Engineering

High-quality professional development prepares teachers to get students engaged in STEM.



High-quality professional development for teachers

- Three phases:
 - Readiness training
 - Core training
 - Ongoing training
- Conducted in partnership with more than 51 colleges and universities across the country.
- Illinois: UIUC and UIC
- More than 3,500 teachers trained in summer 2013.

PLTW partners with a number of leading corporation, philanthropic organizations, and educational institutions.



So, does it work?

YES.

PLTW students achieve **significantly higher scores** in reading, mathematics, and science, and in some cases, have the opportunity to **receive college credit**.

So, does it work?

PLTW alumni study engineering and technology in **greater numbers than the national average**, with a **higher retention rate** in college engineering, science, and related programs than non-PLTW students.





We continue to improve. Every day.

PLTW follows a **continuous improvement model**.

Teachers can **expect** to see **improvements** in course material **each year**.

New, **future-reaching** programs and delivery models are constantly in development.

An engaged network of partners



America's STEM Solution

Over **5,200** programs

More than **4,700** schools



more than **10,500** teachers trained

100s of partners

Let's continue the conversation.

For more information visit: pltw.org or pltw.uillinois.edu

Sena Cooper

Director of School Engagement, PLTW

Champaign

scooper@pltw.org 217-714-9234 (work/mobile)

Brenda Pacey

PLTW Affiliate Director, University of Illinois - UIUC

Champaign

bpacey@uillinois.edu 217-244-5217 (work) 217-621-8784 (mobile)

Steve Parrott

PLTW State Leader, ISBE

Springfield

sparrott@isbe.net 217-782-4620 (work)

