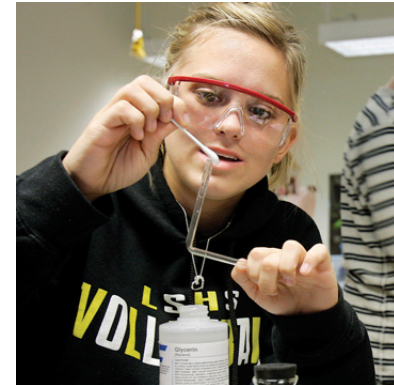# 2017 SC Education and Business Summit
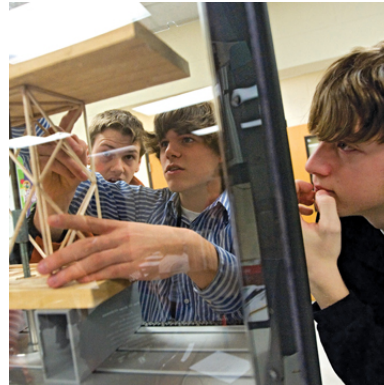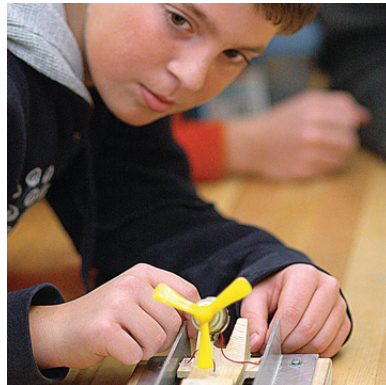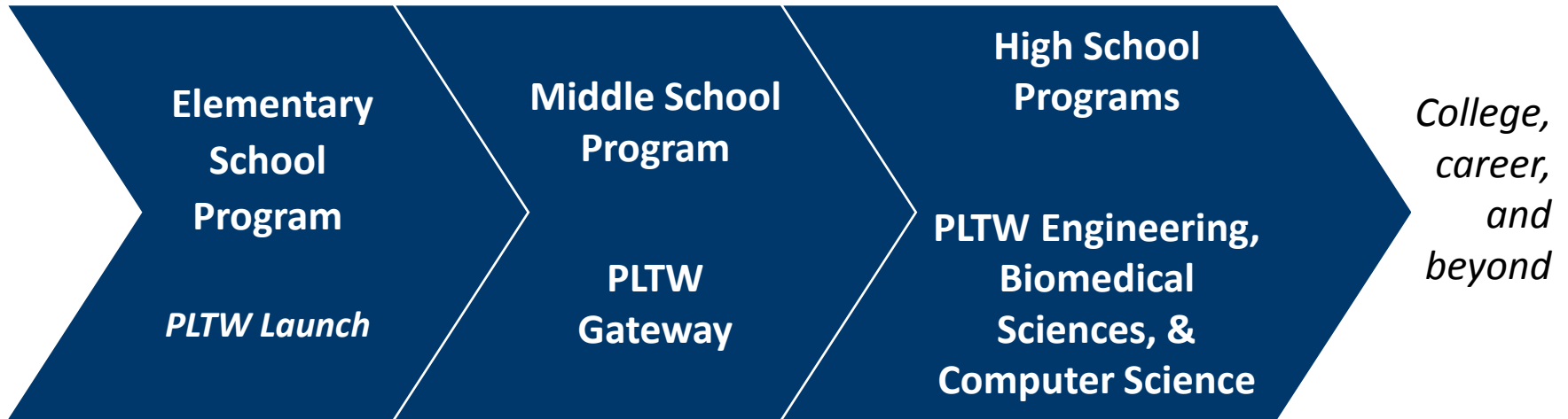
Developing Sustainable and Successful CTE Programs Begins in Kindergarten!

PROJECT LEAD THE WAY
PLTW

Key elements needed to build and sustain high quality K-12 STEM programs

- Leadership-School, District, and Community Support.
- Collaboration between elementary, middle, and high schools.
- Evaluate existing STEM offerings.
- Planning-Develop comprehensive K-12 strategic plan/Career Pathways/Standards alignment/Timeline.
- Funding-Budget adequate funds to support, expand and sustain programs.
- Professional Development/teacher training. Identify and train teachers. Train multiple teachers.

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PLTW offers a comprehensive Kindergarten to Career solution

Elementary School Program

PLTW Launch

Middle School Program

PLTW Gateway

High School Programs

PLTW Engineering, Biomedical Sciences, & Computer Science

College, career, and beyond

PROJECT LEAD THE WAY
PLTW

Project Lead The Way's K-12 Curricular Pathways
Biomedical Science

PLTW Launch

K. Structure and Function: Human

   Body

1. Animal Adaptations

3. Variation of Traits

4. Input/Output: Human Brain

5. Infection: Detection

PLTW Gateway

Medical Detectives

PLTW Programs

Principles of Biomedical Sci.

Human Body Systems

Medical Interventions

Biomedical Innovation

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Project Lead The Way's K-12 Curricular Pathways

Computer Science

PLTW Launch

K. Animals and Algorithms

1. Animated Storytelling

2. Grids and Games

3. Programming Patterns

4. Input/Output: Computer Systems

5. Infection: Modeling and Simulation

PLTW Gateway

Computer Science for

   Innovators and Makers

App Creators

PLTW Programs

Computer Science Essentials

Computer Science Principles

Computer Science A

 Cybersecurity (Fall 2018)

PROJECT LEAD THE WAY
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Project Lead The Way's K-12 Curricular Pathways
Engineering

PLTW Launch

K. Structure and Function: Exploring Design

K. Pushes and Pulls

1. Light and Sound

1. Light: Observing the Sun, Moon, and Stars

2. Materials Science: Properties of Matter

2. Materials Science: Form and Function

2. The Changing Earth

3. Stability and Motion: Science of Flight

3. Stability and Motion: Forces and

   Interactions

4. Energy: Collisions

4. Energy: Conversion

5. Robotics and Automation

5. Robotics and Automation: Challenge

PLTW Gateway

Automation and Robotics

Design and Modeling

Energy and the Environment

Flight and Space

Green Architecture

Magic of Electrons

Science of Technology

PLTW Programs

Introduction to Engineering Design

Principles of Engineering

Aerospace Engineering

Civil Engineering and Architecture

Computer Integrated Manufacturing

Computer Science Principles

Digital Electronics

Environmental Sustainability
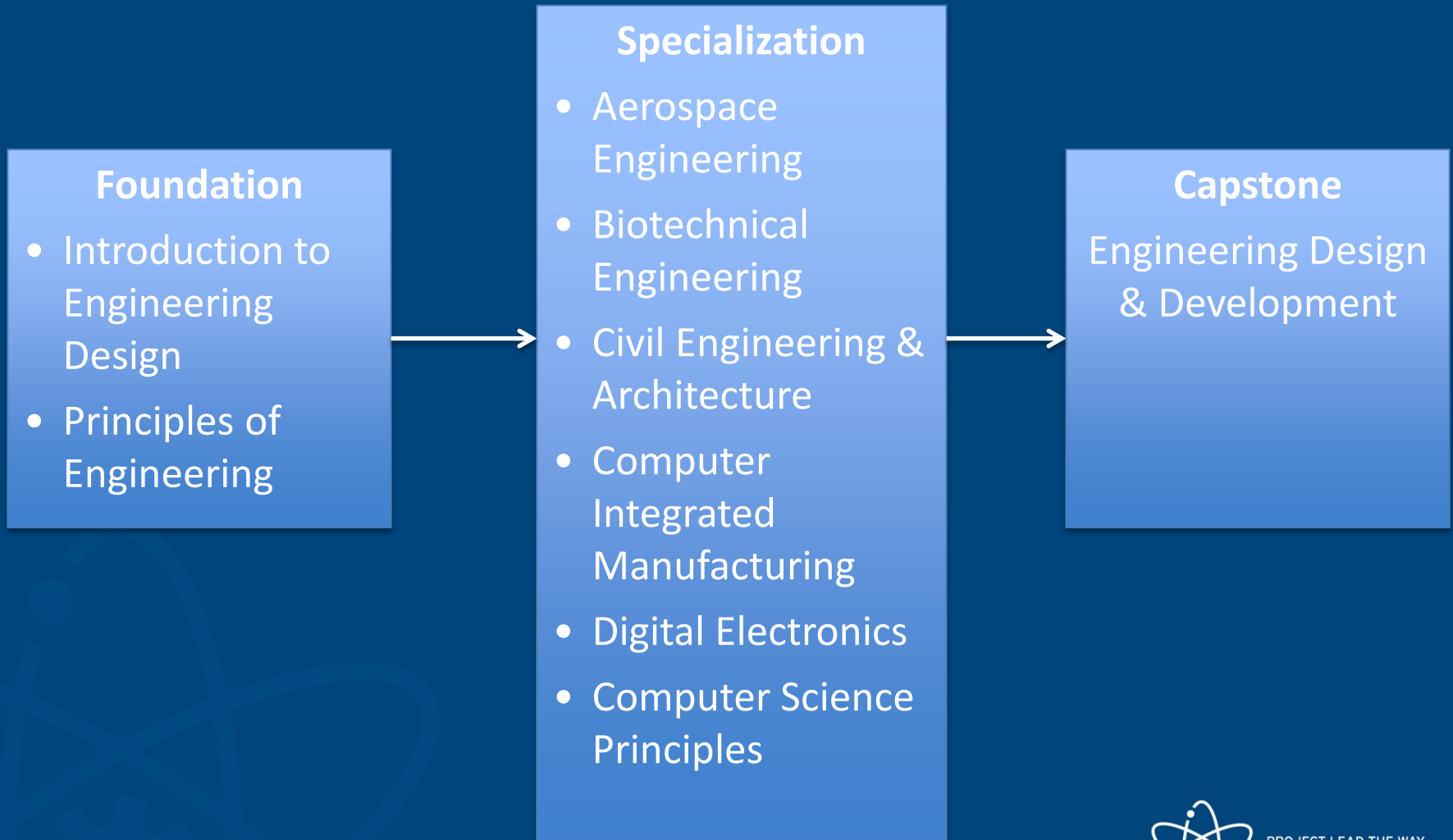Engineering Design and Development

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Key Elements

- Connecting AP® courses and PLTW programs to create **college and career pathways in engineering, biomedical science, and computer science** that will emphasize applied learning and consist of
  - PLTW courses designed to introduce all students to the field.
  - AP courses provide an opportunity to take challenging college-level course work and the potential to earn college credit.
  - PLTW specialization courses that focus on knowledge and skills needed for high-growth careers.

- **Recognitions** for students and schools in engineering, biomedical science, and computer science — similar to AP Scholar Awards

- A portfolio of **career-focused opportunities** sponsored by key industry partners, including work-based learning, mentorship, scholarship, and preferential application.
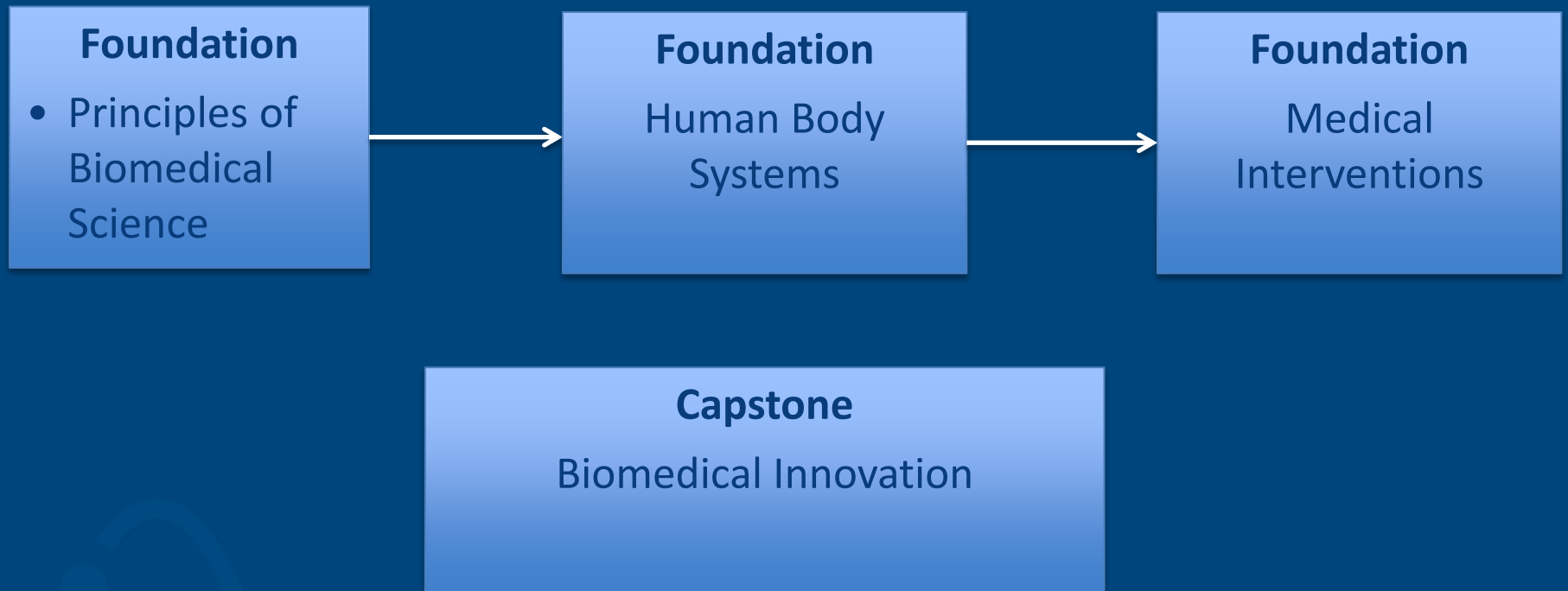
Combining AP® and PLTW Courses

	Engineering	Biomedical Science	Computer Science
College — AP Courses	• AP Biology • AP Calculus AB • AP Calculus BC • AP Chemistry • AP Environmental Science • AP Physics 1: Algebra-Based • AP Physics 2: Algebra-Based • AP Physics C: Electricity and Magnetism • AP Physics C: Mechanics • AP Statistics	• AP Biology • AP Chemistry	• AP Computer Science Principles • AP Computer Science A
Career — PLTW Courses	• Introduction to Engineering Design • Principles of Engineering • Digital Electronics • Computer Integrated Manufacturing • Aerospace Engineering • Civil Engineering and Architecture • Environmental Sustainability	• Principles of Biomedical Science • Human Body Systems • Medical Interventions	• Introduction to Computer Science • Cybersecurity (Fall 2018)

Engineering Course Structure

Foundation

- Introduction to Engineering Design
- Principles of Engineering

Specialization

- Aerospace Engineering
- Biotechnical Engineering
- Civil Engineering & Architecture
- Computer Integrated Manufacturing
- Digital Electronics
- Computer Science Principles

Capstone

Engineering Design & Development

Biomedical Course Sequence

Foundation
- Principles of Biomedical Science

→

Foundation

Human Body Systems

→

Foundation

Medical Interventions

Capstone

Biomedical Innovation

PROJECT LEAD THE WAY
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Computer Science Course Structure

Introduction

- Computer Science Essentials

Foundation

- Computer Science Principles
- Computer Science A

Capstone

- Cybersecurity

PROJECT LEAD THE WAY
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PLTW Gateway units

9 week units designed for grades 6-8

Foundation Units

Design & Modeling

Automation & Robotics

Medical Detectives

Computer Science for Innovators and Makers

App Creators

Specialized Units

Flight & Space

Science of Technology

Energy and the Environment

Green Architecture

Magic of Electrons

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Gateway Curriculum Enhancements

New PLTW Gateway Computer Science Units

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

Gateway Curriculum Enhancements

• **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.

Gateway Curriculum Enhancements

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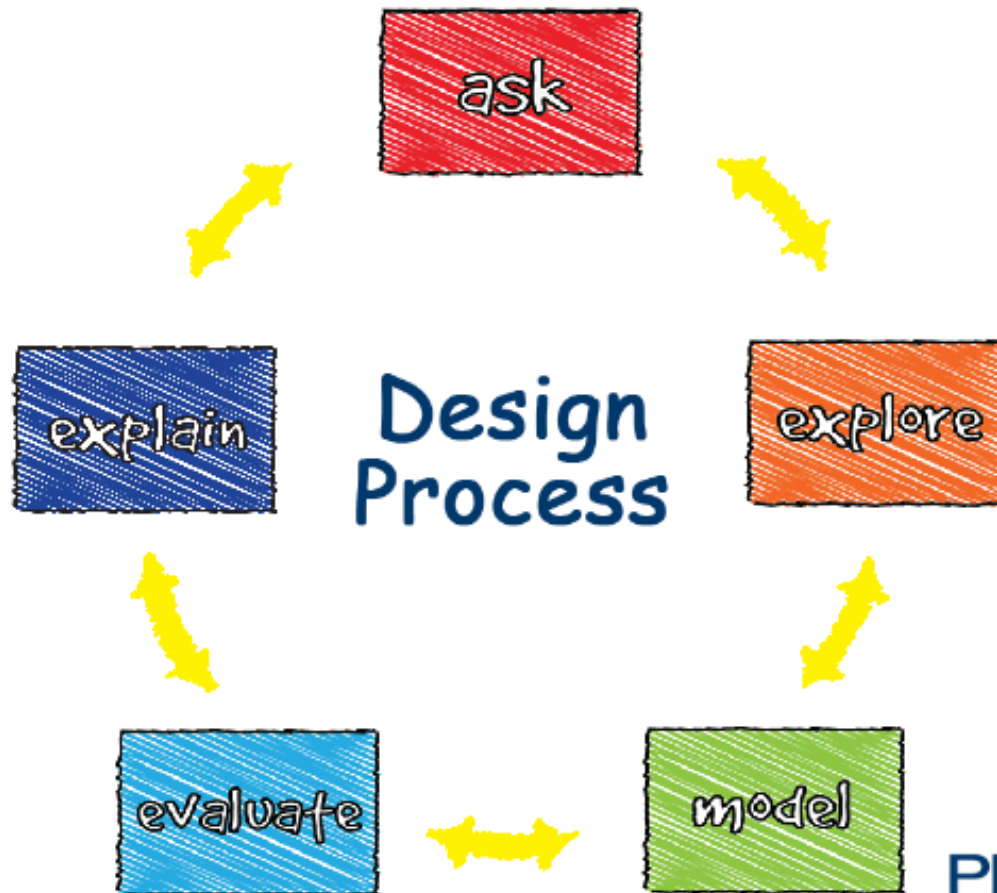
The unit will expose students to computer science as a means of computationally analyzing and developing solutions to authentic problems, and will convey the positive impact of the application of computer science to other disciplines and to society.

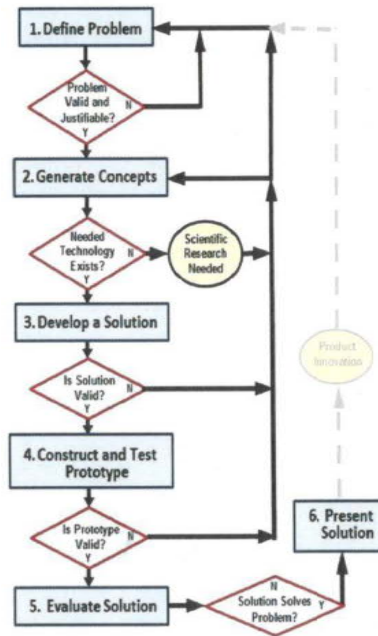PROJECT LEAD THE WAY
PLTW
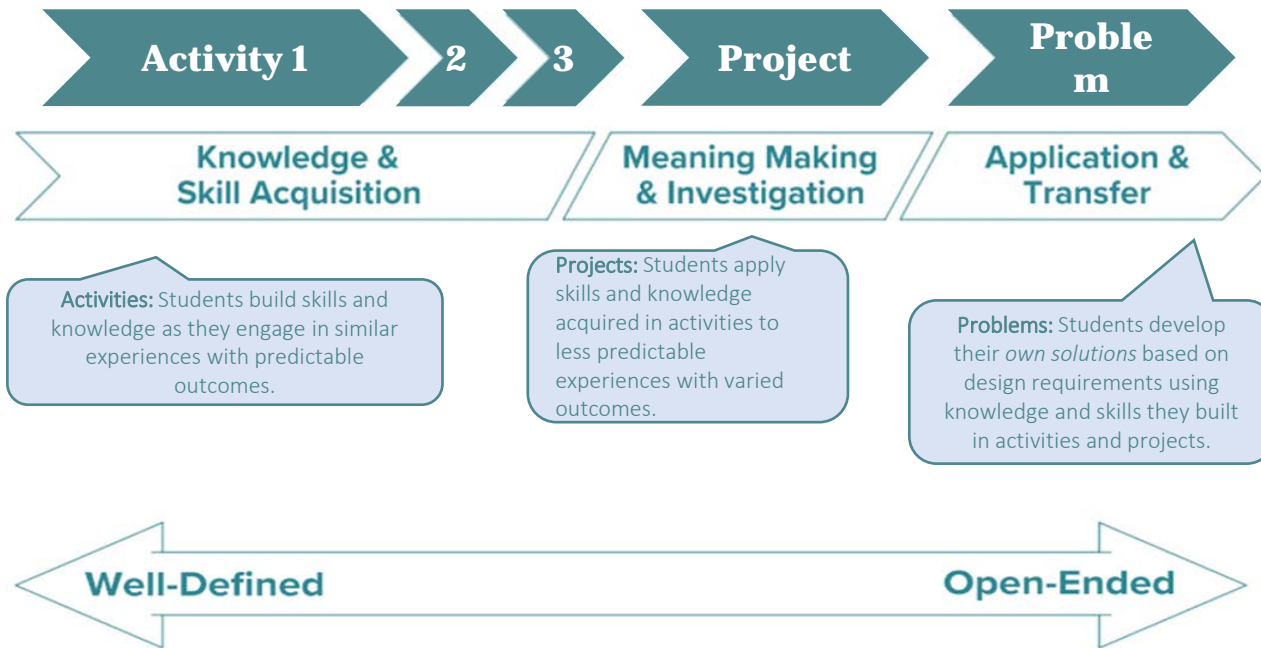
PLTW Launch Modules

The design process evolves to become more complex and rigorous as students progress K-12

Launch

Gateway

High School
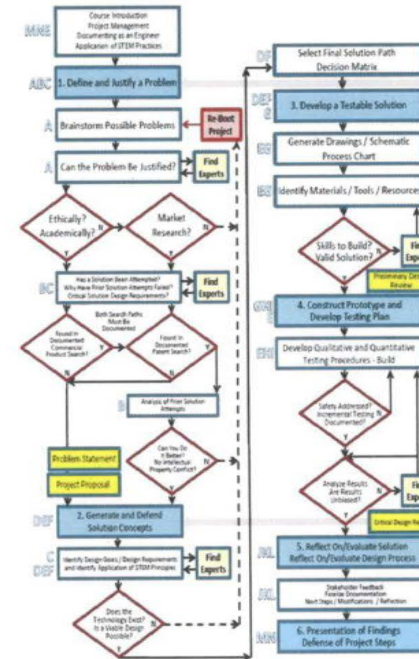
Modules Aligned to Grade Level

|				
Kindergarten	Structure and Function: Exploring Design	Pushes and Pulls	Structure and Function: Human Body	Animals and Algorithms
1st Grade	Light and Sound	Light: Observing the Sun, Moon, and Stars	Animal Adaptations	Animated Storytelling
2nd Grade	Materials Science: Properties of Matter	Materials Science: Form and Function	The Changing Earth	Grids and Games
3rd Grade	Stability and Motion: Science of Flight	Stability and Motion: Forces and Interactions	Variation of Traits	Programming Patterns
4th Grade	Energy: Collisions	Energy: Conversion	Input/Output: Computer Systems	Input/Output: Human Brain
5th Grade	Robotics and Automation	Robotics and Automation: Challenge	Infection: Detection	Infection: Modeling and Simulation

Modules Aligned to Kindergarten Standards

- Structure and Function: Exploring Design

- Pushes and Pulls

- Structure and Function: Human Body

- Animals and Algorithms

Paintbrush design challenge

Aligned to kindergarten standards

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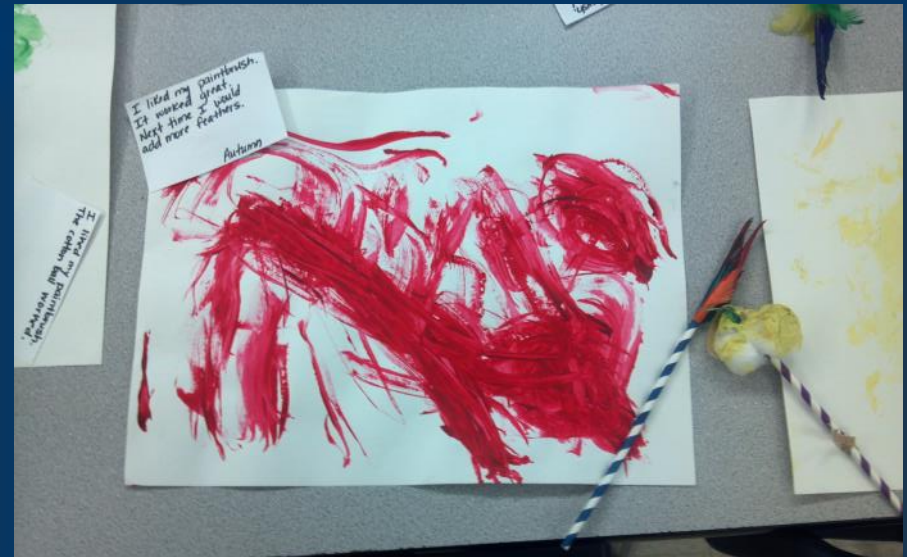
The Beanstalk activity is one component of the structure & function module

Structure & Function

Intro	Introduction
1	Activity 1: What are Structure and Function?
2	Activity 2: Build a Beanstalk
3	Activity 3: Straw, Wood, and Bricks
4	Project 4: Design a House
5	Problem 5: Paintbrush Design

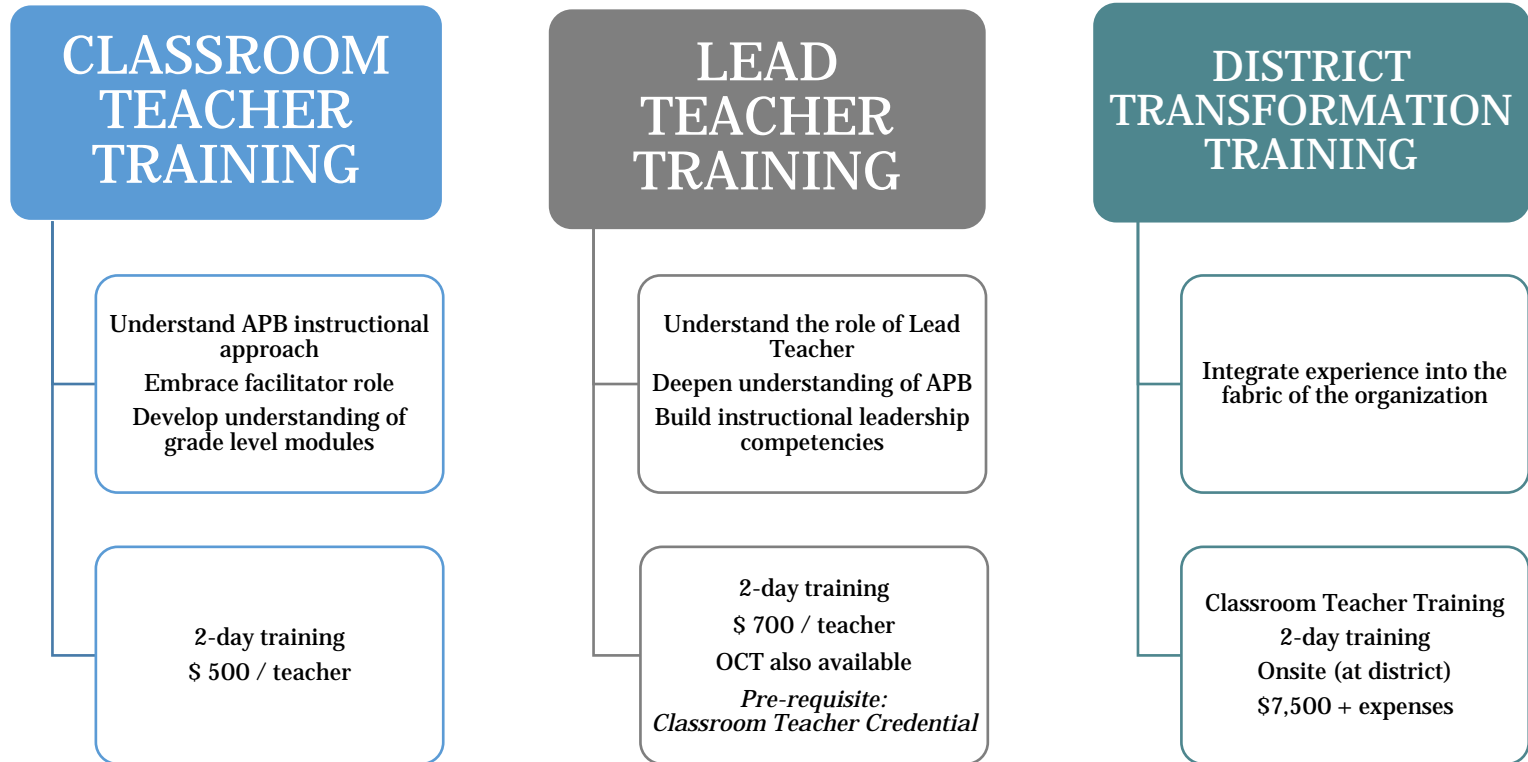*Activities help students build knowledge and skills they need to solve problems – they are not activities for activity sake*

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PLTW Launch Professional Development

More Options for Your Teachers, School, and District

PLTW Launch PD at a Glance

CLASSROOM TEACHER TRAINING

Understand APB instructional approach

Embrace facilitator role

Develop understanding of grade level modules

2-day training

$ 500 / teacher

LEAD TEACHER TRAINING

Understand the role of Lead Teacher

Deepen understanding of APB

Build instructional leadership competencies

2-day training

$ 700 / teacher

OCT also available

Pre-requisite: Classroom Teacher Credential

DISTRICT TRANSFORMATION TRAINING

Integrate experience into the fabric of the organization

Classroom Teacher Training

2-day training

Onsite (at district)

$7,500 + expenses

PROJECT LEAD THE WAY
PLTW

Tips for a Stronger PLTW Application

- Use direct language with supporting details. Avoid acronyms.

- Provide context. Write as if reviewers know little of your region, district, and school's educational landscape, economic situation, large-scale initiatives, etc.

- Give specific examples of support for PLTW. Examples include program selection, financial support, scheduling, teacher selection, community engagement, etc.

- Describe planning efforts such as who has been part of conversations, any events attended, any schools or districts visited or spoken with, what program aspects have been decided and what still needs to be addressed, etc.

- Humanize the application where it makes sense. Examples include an anecdote of the selected teacher demonstrating PLTW teacher qualities, a student affected by PLTW, or why/how the school or district became interested in PLTW in the first place.

![PROJECT LEAD THE WAY PLTW]

How to apply

1. Go to https://www.pltw.org/experience-pltw/funding-and-grant-opportunities
2. Check out this page's resources and information
3. Click "Apply for a PLTW Grant"
4. Download the PDF version of the application.
5. Work on the application offline.
6. Once ready, submit your responses.
7. Sit back and relax!