



From Problem To Enterprise

How Project Based Learning like
PLTW Builds Sustainable
Student-Led Businesses

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VP Partnerships | Work-based Learning

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The Strongest student-led businesses don't start with something students can make.

They start with a problem worth solving.



“Students have a laser engraver. What can they sell?”

VS.

“What problem does our school or community have, and could students build a solution?”

Why Curriculum Alignment Matters

Extra Curricular SLB

- Competes for teacher/student time
- Often depends on one champion
- Product may drive the experience
- Difficult to sustain year to year

Curricular-Aligned SLB

- Reinforces course competencies
- Produces authentic student evidence
- Uses projects already occurring in class
- Creates a repeatable instructional model
- Makes industry participation purposeful

The business becomes the context in which students apply what they are learning

STEM Pathways That Spark Purpose and Possibility for Every Learner

From curiosity-sparking PreK–5 modules to high school Engineering, Computer Science, and Biomedical Science courses, PLTW helps students build real-world skills and discover what's possible, opening doors to more than 280 career paths.

PreK–5

PLTW LAUNCH 42 modules • ~10–14 hours each

PreK

- Healthy Habits
- Living and Nonliving Things
- Floating and Sinking
- Spatial Sense and Coding

Kindergarten

- Structure and Function: Exploring Design
- Pushes and Pulls
- Structure and Function: Human Body
- Animals and Algorithms
- Sunlight and Weather
- Living Things: Needs and Impacts

First Grade

- Light and Sound
- Light: Observing Sun, Moon, and Stars
- Animal Adaptations
- Animated Storytelling
- Designs Inspired by Nature

Second Grade

- Materials Science: Properties of Matter
- Materials Science: Form and Function
- Grids and Games
- The Changing Earth
- Living Things: Diversity of Life

Third Grade

- Stability and Motion: Science of Flight
- Stability and Motion: Forces and Interactions
- Variation of Traits
- Programming Patterns
- Weather Factors and Hazards
- Life Cycles and Survival
- Environmental Changes

Fourth Grade

- Input/Output: Computer Systems
- Input/Output: Human Brain
- Waves and Properties of Light
- Organisms: Structure and Function
- Earth: Past, Present, and Future
- Earth: Human Impact and Natural Disasters
- Energy Exploration

Fifth Grade

- Robotics and Automation
- Robotics and Automation: Challenge
- Infection: Detection
- Infection: Modeling and Simulation
- Matter: Properties and Reactions
- Ecosystems: Flow of Matter and Energy
- Patterns in the Universe
- Earth's Water and Interconnected

6–8

PLTW GATEWAY 10 units • ~36–45 hours each

- Medical Detectives
- App Creators
- Computer Science for Innovators and Makers
- Automation and Robotics
- Design and Modeling
- Energy and the Environment
- Flight and Space
- Green Architecture
- Magic of Electrons
- Science of Technology

6–12

PLTW ALGEBRA 1 ADVANTAGE Supplemental course

Focus Areas

- Computer Science
- Engineering
- Biomedical Science

9–12

PLTW COMPUTER SCIENCE

5 courses • ~160–180 days each

- Computer Science Essentials
- Computer Science Principles
- Cybersecurity
- Computer Science A
- PLTW Capstone

9–12

PLTW ENGINEERING

11 courses • ~160–180 days each

- Engineering Essentials
- Introduction to Engineering Design
- Principles of Engineering
- Aerospace Engineering
- Civil Engineering and Architecture
- Computer Integrated Manufacturing
- Digital Electronics
- Environmental Sustainability
- Computer Science Principles
- Advanced Manufacturing **NEW!**
- PLTW Capstone

9–12

PLTW BIOMEDICAL SCIENCE

5 courses • ~160–180 days each

- Principles of Biomedical Science
- Human Body Systems
- Medical Interventions
- Biomedical Innovation
- PLTW Capstone

Program Overview

PLTW LAUNCH (PreK–5) taps into students' exploratory nature, engaging them in hands-on learning that feels like play. While shaping equity and critical skills will use for years to come, you can inspire even the youngest students to discover engineering, computer science, biomedical science, and more.

PLTW GATEWAY (6–8) sparks a joy of discovery and illuminates the range of paths and possibilities students can look forward to in high school and beyond. Unlock students' passion and inspire future careers in robotics, coding, medicine, sustainability, and more.

PLTW ALGEBRA 1 ADVANTAGE (6–12) is an Algebra 1 supplement that connects real-world scenarios to algebraic concepts. Through dynamic, interactive problems and projects, students are immersed in authentic challenges showcasing Algebra's practical applications, bridging theory to reality.

PLTW COMPUTER SCIENCE (9–12) engages students in real-world projects and problems that challenge them to apply computational thinking and logic. Students can explore game design and development and earn AP credit in computer science courses.

PLTW ENGINEERING (9–12) empowers students to step into the role of an engineer and adopt a problem-solving mindset, inspiring them to imagine themselves in engineering careers. Students build in-demand skills as they learn civil, aerospace, and design engineering, plus much more.

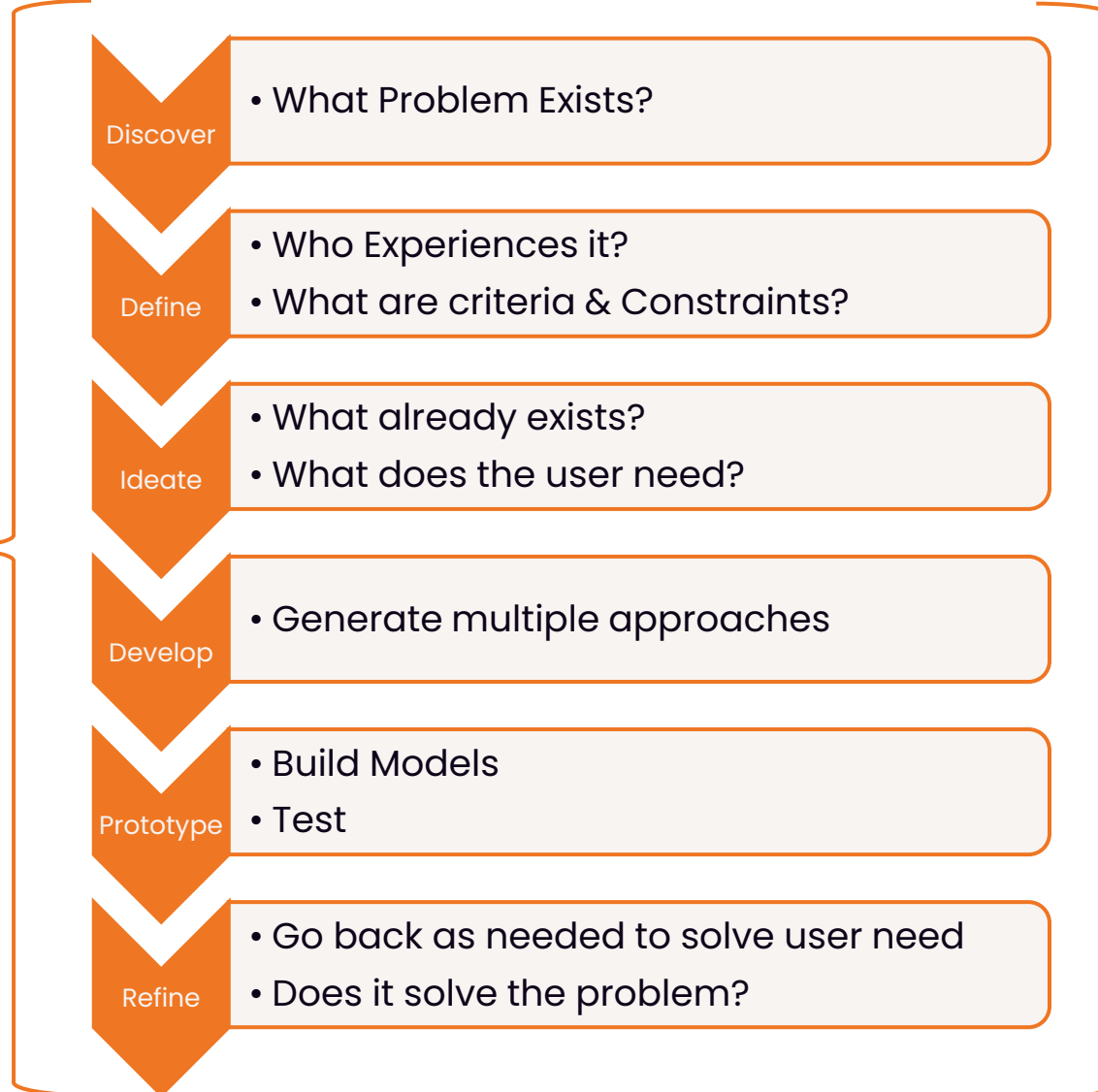
PLTW BIOMEDICAL SCIENCE (9–12) inspires students to make an impact on others' lives and empowers them to pursue a future in diagnosing, treating, or preventing disease. Working with tools professionals use, students explore medical principles and innovations.

PLTW Starts with the Problem

Solve first. Sell Second.

Ask the Business Question:

Does this solution create enough value to become a repeatable product or service?



Entrepreneurship isn't "making something then figuring out how to sell it."

Good entrepreneurship is another form of problem solving

When Does a Project Become a Business?

A Great Project isn't Automatically a Great Enterprise

PLTW Project

Students Can:

- Identify a Problem
- Research
- Design
- Prototype
- Test
- Analyze Data
- Iterate
- Communicate a Solution

Ask:

- Who needs this?
- How often?
- Why this solution?
- Would they use or pay for it?
- Can students deliver it repeatedly?



Student-Led Business

Students now also need:

- Customer Directory
- Marketing
- Pricing / Finance
- Production Planning
- Inventory / Supply Chain
- Quality Control
- Sales
- Customer Service
- Operations

This is the opportunity for partnerships

Where Industry Makes the SLB Better

Industry Adds the Business Reality Layer

PLTW Foundation

- Problem Identification
- Criteria & Constraints
- Prototyping
- Testing
- Iteration
- Team Roles
- Documentation
- Technical Presentation
- Data Analysis
- Manufacturing / Design

Students don't need industry to solve the problem for them.

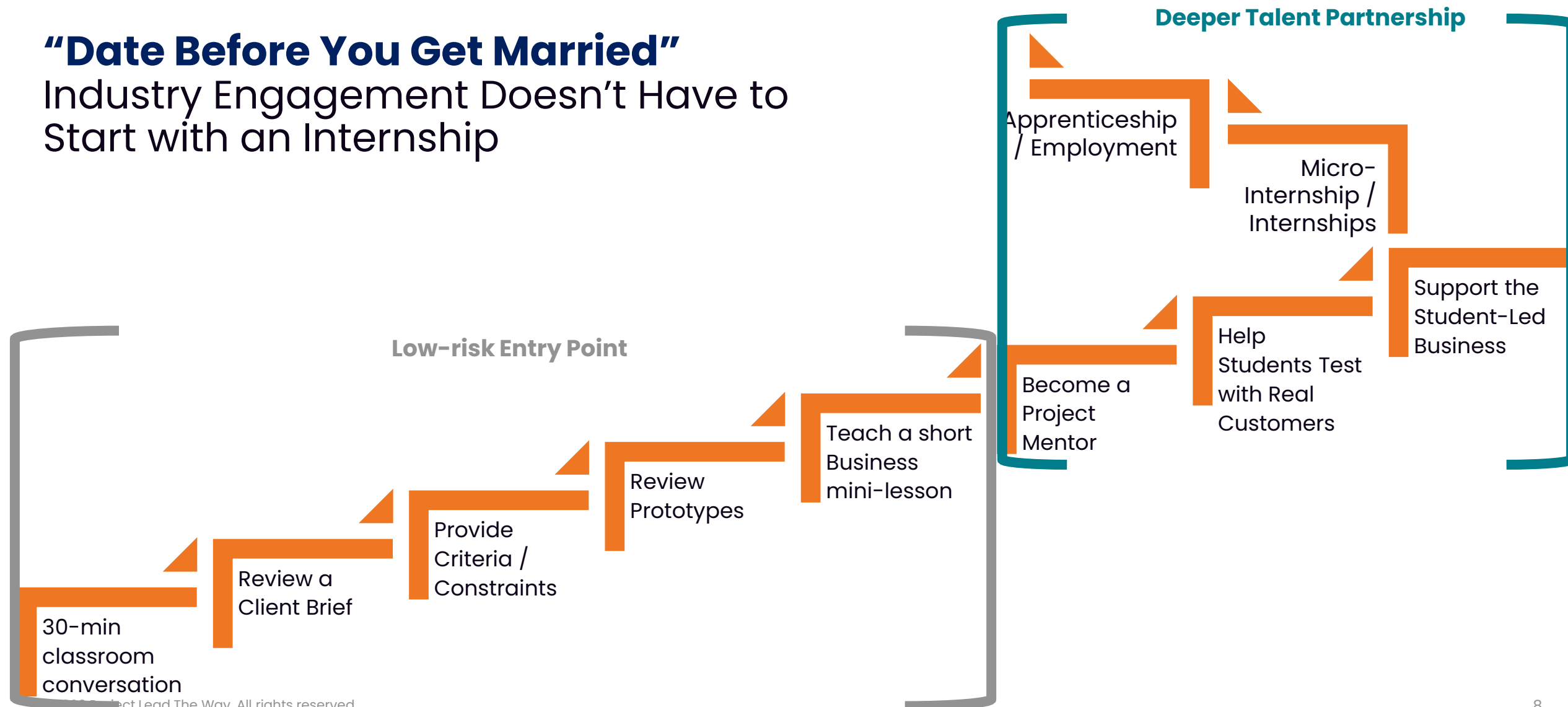
They need industry to introduce the realities students don't know yet.

Industry / Business Extension

- Customer Discovery
- Market Constraints
- Product / Service Viability
- Quality Assurance
- Continuous Improvement
- Organizational Responsibility
- Operating Procedures
- Customer / Sales Communications

"Date Before You Get Married"

Industry Engagement Doesn't Have to Start with an Internship



What Could this Look Like in PLTW?

One Curriculum, many Possible Enterprises

Engineering / Advanced Manufacturing

PLTW foundation:

- CAD
- Prototypes
- Client Constraints
- Fabrication
- Workcells
- Production Optimization
- Quality

Possible SLB Extension:

A student designed / fabrication service solving recurring needs for the school, CTSOs, or community.

Computer Science / Cybersecurity

PLTW foundation:

- Coding
- Client problems
- Cybersecurity Practices
- AI / Data Applications

Possible SLB Extension:

A supervised student technology service responding to authentic school / community needs. IE – Students working alongside district IT personnel or providing a technology recycling program for the elderly / disadvantaged.

Biomedical Science

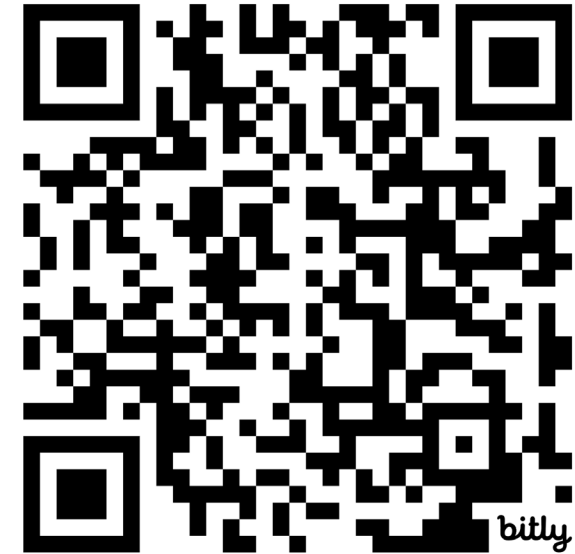
PLTW foundation:

- Healthcare Scenarios
- Biomedical investigation
- Health / wellness problems
- Research
- Documentation
- Problem Solving

Possible SLB Extension:

Student-developed health education, wellness, outreach, or other appropriate non-clinical product & services.

<https://bit.ly/4xYjTLB>



Your Turn: From Problem to Enterprise

Choose one authentic problem (7 minutes).

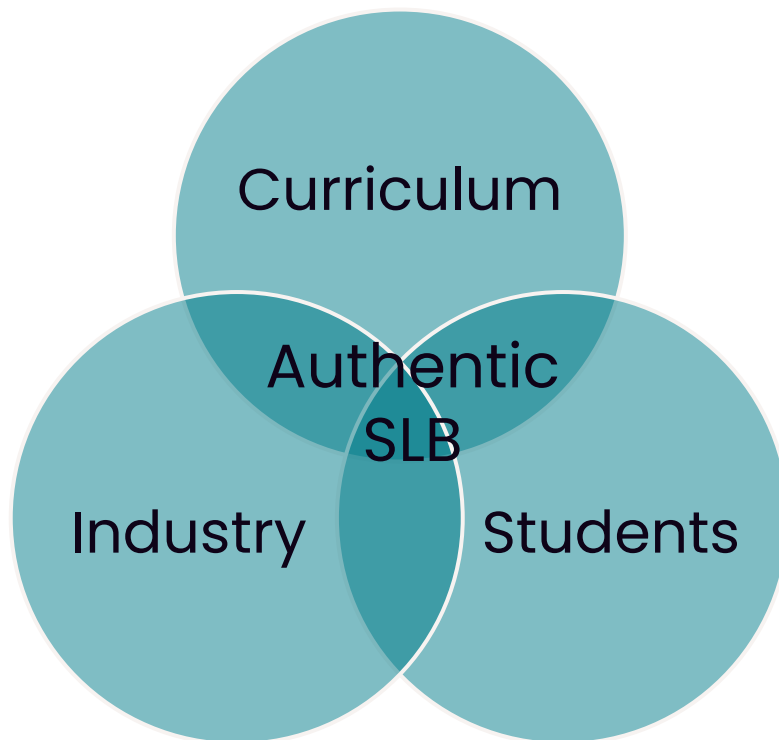
1. **What is the problem?**
2. **Who experiences it?**
3. **What criteria or constraints should students investigate?**
4. **What could students design, build, analyze, or provide?**
5. **How could the solution become a repeatable product/service?**
6. **What business expertise is missing?**
7. **What is the smallest useful ask you could make of an industry partner?**

Don't begin by deciding what students will sell. Begin with who needs something solved

Table Share outs (3 min):

Share Problem + Enterprise Idea + "First Date" Industry Ask

Final Thoughts: Start Small. Build Authenticity. Grow the Relationship



PLTW helps students prove they can solve real problems. A student-led business gives them the opportunity to prove they can turn those solutions into value for someone else.



<https://bit.ly/4yKsT78>

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