



## PLTW Engineering

### Principles of Engineering | Update

Dear PLTW Principles of Engineering Educators,

Once again, we want to express our gratitude for your valuable feedback and dedication to creating an exceptional Principles of Engineering (POE) experience for your students. Based on survey results as well as additional responses from our Master Teachers and the POE network at large, POE will be republished on Dec. 22, 2023 to reflect your feedback.

#### 1. Course Realignment

POE has been realigned to reflect the following course sequence:

- Introduction to Product Design and Development (optional)
- Unit 1: Mechanical Design
- Unit 2: Application of Robotics
- NEW Unit 3: Energy in Action
- Unit 4: Designing infrastructure and Developing Sustainability

You can see these changes reflected in our new [Course Outline](#) and [Course Resume](#).

Due to this realignment the numbering sequence of activities, projects, and problems will shift to reflect the following changes. Please note that to satisfy network feedback, course length, and other factors, several activities have been removed; those activities are highlighted in red. Additionally, some activities have been added, and those are highlighted in teal.

Current Unit 1	New Optional Introduction to Product Design and Development
1.1.1 - Newspaper Shoes	0.1.1 - Newspaper Shoes
1.1.2 - What's the Problem	0.1.2 - What's the Problem
1.1.3 - Choosing the Best Solution	0.1.3 - Choosing the Best Solution
1.1.4 - Construct, Test, and Evaluate	0.1.4 - Construct, Test, and Evaluate
1.1.5 - Present and Reflect	0.1.5 - Present and Reflect
1.2.1 - Technical Drawings	0.2.1 - Technical Drawings
1.2.2 - Parametric Modeling	0.2.2 - How Was it Made
1.2.3 - How Was it Made?	0.2.3 - Tolerance Analysis
1.2.4 - Tolerance Analysis	0.3.1 - Material Analysis
1.2.5 - Footprint Design	0.3.2 - Nothing Lasts Forever
1.3.1 - Material Analysis	0.3.3 - Selecting a Material
1.3.2 - Nothing Lasts Forever	0.4.1 - Design a Shoe For You
1.3.3 - Selecting a Material	
1.4.1 - Design a Shoe For You	



Current Unit 3	New Unit 1
3.1.1 - Over Easy Engineering	1.1.1 - Over Easy Engineering
3.1.2 – What’s Simple About a Combine	1.1.2 – What’s Simple About a Combine
3.1.3 - Powerful Pulleys	1.1.3 - Mechanical System Efficiency
3.1.4 - Top Gear	1.1.4 - Powerful Pulleys
3.1.5 - Tug of War	1.1.5 - Top Gear
3.2.1 - A door-able hens	1.1.6 - Maximizing Power
3.2.2 - Converting Types of Motion	1.1.7 - Tug of War
3.2.3 - Motion Conversion Challenge	1.2.1 - A-door-able Hens
3.3.1 - Fix Fran’s Farm	1.2.2 - Converting Types of Motion
	1.2.3 - Motion Conversion Challenge
	1.3.1 - Fix Fran’s Farm

Current Unit 4	New Unit 2
4.1.1 – Silly Walks	2.1.1 - Silly Walks
4.1.2 - A Robotic Revolution	2.1.2 - A Robotic Revolution
4.2.1 - Going the Distance	2.2.1 - Going the Distance
4.2.2 - Chain Reaction	2.2.2 - Chain Reaction
4.2.3 - Moving with Color	2.2.3 - Moving with Color
4.2.4 - Biomimicry	2.2.4 - Biomimicry
4.3.1 - AI Robotic Greeting	2.3.1 - AI Robotic Greetings
4.3.2 - Ethics in AI	2.3.2 - Ethics in AI
4.3.3 - Robots for Good	2.3.3 - Robots for Good
4.1.4 - Robotic Symphony	2.4.1 - Robotic Symphony

New Unit 3	
3.1.1 - Illumination Creation	
3.1.2 - Ohm’s Law Lab	
3.1.3 - Parallel vs Series Lab	
3.1.4 - Equivalent Resistance	
3.1.5 - Kirchhoff’s Law Lab	
3.1.6 - Volt Vaults	
3.2.1 - Under Pressure	
3.2.2 - Mathematics of Pressure	
3.2.3 - Pressurized Power	
3.3.1- Gravitare to Greatness	
3.3.2 - Horizontal Projectile Motion	
3.3.3 - Application of Kinematics	
3.4.1 – Auto Golf	

Current Unit 2	New Unit 4
2.1.1 - Cantilever Design Challenge	4.1.1 - Cantilever Design Challenge
2.1.2 - Beam Deflection	4.1.2 - Beam Deflection
2.1.3 - Free Body Diagrams	4.1.3 - Free Body Diagrams
2.1.4 - Moments	4.1.4 - Stressed and Strained
2.1.5 - Methods of Joints	4.1.5 - Tensile Testing
2.1.6 - Designing with Trusses	4.1.6 - Moments



Current Unit 2 cont.	New Unit 4 cont.
2.2.1 - Endless Energy	4.1.7 - Method of Joints
2.2.2 - Waterwheel Design	4.1.8 - Designing with Trusses
2.2.3 - Life Cycle Assessment	4.2.1 - Endless Energy
2.3.1 - Traffic Flow Rate	4.2.2 - Waterwheel Design
2.3.2 – What's the Optimal Speed Limit	4.3.1 - Traffic Flow Rate
2.3.3 - Intersection Design	4.3.2 – What's the Optimal Speed Limit
2.3.4 - Lend a Helping Hand	4.3.3 - Intersection Design
2.4.1 - Infrastructure Redesign	4.3.4 - Lend a Helping Hand
	4.4.1 - Infrastructure Redesign

## 2. Transitional Support

- We will be hosting a webinar in early February to discuss details to support you through this transition, including strategies to cover new topics.

## 3. Equipment

- All equipment purchased will continue to be utilized in the updated course. The development team has made a concerted effort to utilize materials that are currently available to neutralize the shift in cost.
- Any additional consumables will be available in the myPLTW Store in January 2024.

## 4. Assessment

- Both the legacy and updated POE courses will have End-of-Course (EoC) Assessments available.
  - Students rostered for the legacy POE course will be eligible to take the EoC in fall 2023 and spring 2024.
  - Students rostered for the updated POE course will be eligible to take the EoC only in Spring 2024.
- When we announced that the legacy POE course would be available for one more year, we provided guidance that students wishing to take an EoC should be rostered in POEL.
- The new EoC for POE will be reflective of the updates released on Dec. 22, 2023. We recognize this will present a challenge for new POE teachers and students who may not have worked through topics that will be included from the legacy course. These topics will be discussed during the webinar in February.

## 5. Core Training

- The new unit, as well as updates to existing units, will be updated in the PLTW Core Training experience.
- Any teachers that were trained in POE will have access to an online webinar in early February for training on new topics.

## 6. Timeline

- POE will be republished on Dec. 22, 2023 after schools have closed.
- Changes to training will be reflected the beginning of 2024.
- Both POE and POEL will remain available through June of 2024. At that time POE Legacy will be sunset.

We deeply appreciate your active participation in this collaborative journey. Thank you once again for your dedication to providing the best possible POE experience for your students. If you have additional questions, please contact the PLTW Solution Center at 877.335.7589 or [solutioncenter@pltw.org](mailto:solutioncenter@pltw.org).