

Project Lead The Way 101: Engineering & Biomedical Sciences



Glade Montgomery, Project Lead The Way

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October 28, 2015

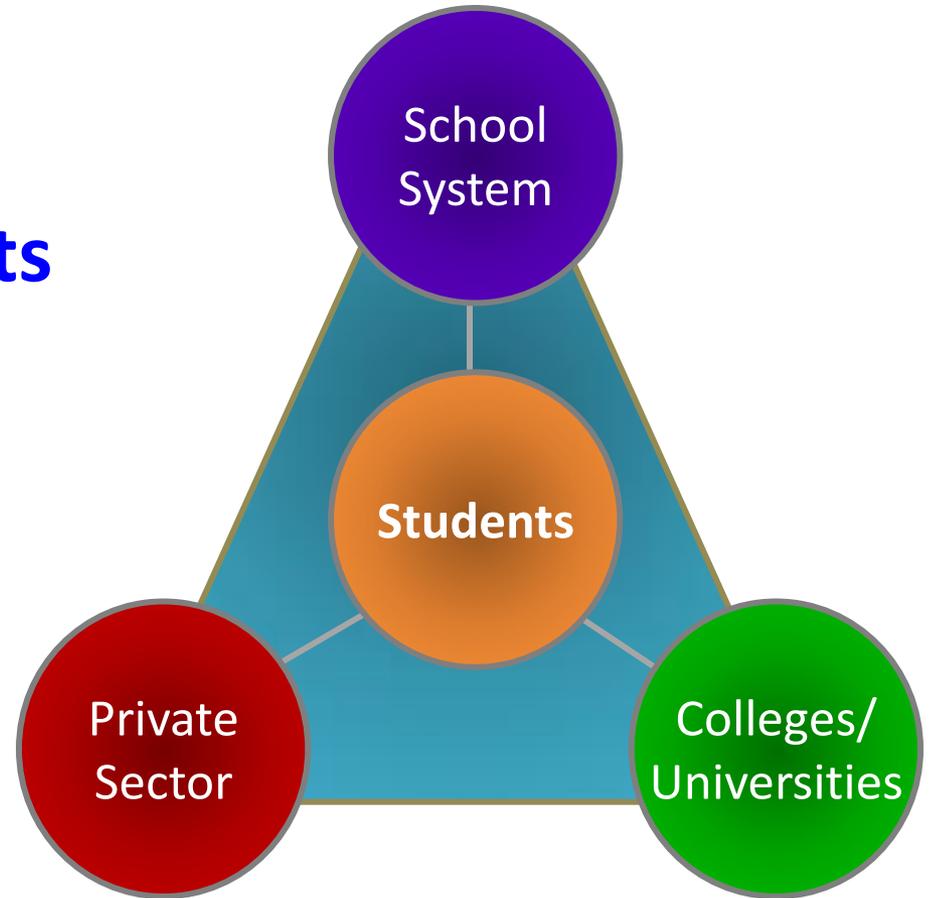


Maryland's CTE: Educating Tomorrow's Workforce Today

PLTW's Mission

Mission...

**To Empower Students
to Thrive in an
Evolving World**



The Role of the Counselor in PLTW

1. Assist in the Recruitment of Students by Communicating the Attributes of the Programs
2. Assist in the Retention of Students
3. Monitor Student Progress as They Matriculate through the Program
4. Keep Current
5. Demonstrate how items one through four are accomplished during the College Certification Visits

PLTW High School Program (Engineering)

Foundation Courses

- *Introduction to Engineering Design*
- *Principles of Engineering*
- Digital Electronics

Pathway Courses (HS offers 1 or more)

- Aerospace Engineering
- Civil Engineering/Architecture
- Computer Integrated Manufacturing
- Computer Science and Software Engineering
- Environmental Sustainability

Capstone Course

- Engineering Design and Development

High School Program - Engineering					College Program
Requirements	Grade 9	Grade 10	Grade 11	Grade 12	
English - 4	English 9	English 10	English 11	English 12	English/Lang. Arts (__ Credits) Include AP options
			AP Language	AP Literature	
Social Studies - 3	Us Govt.	World History	US History	Government	Humanities/Social Studies (__ Credits) Include AP options
		AP European	AP US History	AP Government	
Mathematics - 4	Algebra I	Geometry	Algebra II	Trigonometry or Pre-Calculus or Calculus or	Mathematics (__ Credits) Include AP options
				AP Calculus	
Science - 3	Earth or Physical Sci.	Biology or	Chemistry or	Physics or	Science (__ Credits) Include AP Options
		AP Biology	AP Chemistry	AP Physics	
Phys Ed. - .5/ Health Ed. - .5	.5 Phys Ed.	.5 Health			
Fine Arts - 1	.5 Fine Arts	.5 Fine Arts			
Tech Ed - 1	Intro to Eng. Design				
CTE Completer- 4		CTE Program Sequence			Career Program Concentration (__ Credits) Include Articulation Options, Dual Enrollment, Credit by Exam and Pre-apprenticeship
		POE (1)	DE & AE (2)	EDD (1)	
Foreign Lang. – 2 or Adv. Tech Ed. - 2	Language	Language	Advanced Technology Education	Advanced Technology Education	

PLTW High School Program (Biomedical Sciences)

- Principles of Biomedical Sciences introduces students to the study of human medicine, research processes and bioinformatics
- Human Body Systems explores basic human physiology.
- Medical Interventions has students investigate various ways to extend and improve the quality of life.
- Biomedical Innovations has students designing and conducting experiments related to the diagnosis, treatment and prevention of disease or illness.

High School Program – Biomedical Sciences

College Program

Requirements	Grade 9	Grade 10	Grade 11	Grade 12
English - 4	English 9	English 10	English 11	English 12
			AP Language	AP Literature
Social Studies - 3	Us Govt.	World History	US History	Government
		AP European	AP US History	AP Government
Mathematics - 4	Algebra I	Geometry	Algebra II	Trigonometry or Pre-Calculus or Calculus or
				AP Calculus
Science - 3	Earth or Physical Sci. or Biology	Earth or Physical Sci. or Biology or	Chemistry or	Physics or
		AP Biology	AP Chemistry	AP Physics
Phys Ed. - .5/ Health Ed. - .5	.5 Phys Ed.	.5 Health		
Fine Arts - 1	.5 Fine Arts	.5 Fine Arts		
Tech Ed - 1	Foundations of Technology			
CTE Completer- 4		CTE Program Sequence – 2 options		
		PBS (1)	HBS (1)	MI & BI(2)
		PBS (1)	HBS (1)	MI (1)
Foreign Lang. or Adv. Tech Ed. – 2	Language	Language	Adv. Tech Ed.	Adv. Tech Ed.

English/Lang. Arts (__ Credits) Include AP options
Humanities/Social Studies (__ Credits) Include AP options
Mathematics (__ Credits) Include AP options
Science (__Credits) Include AP Options
Career Program Concentration (__ Credits) Include Articulation Options, Dual Enrollment, Credit by Exam and Pre-apprenticeship

PLTW High School Program (Computer Science)

Introductory Course (1/2 year)

- Introduction to Computer Science

Foundation Courses (1 year)

- Computer Science and Software Engineering
- Computer Science Applications

Pathway Courses (1/2 year)

- Simulation and Modeling
- Artificial Intelligence
- Cybersecurity

Capstone Course (1 year)

- Computational Problem Solving

Middle School Program: Gateway To Technology

Foundation Units

- Automations and Robotics
- Design and Modeling

Specialization Units

- The Magic of Electrons
- The Science of Technology
- Flight and Space
- Energy and the Environment
- Intro to Computer Science 1
- Intro to Computer Science 2
- Green Architecture
- Medical Detectives

Elementary School Program: PLTW Launch

Section	PLTW Launch Module	Standards Alignment
K.1	Structure and Function: Exploring Design	Kindergarten
K.2	Structure and Function: Pushes and Pulls	Kindergarten
K.3	Materials Science: Properties of Matter	Kindergarten
K.4	Materials Science: Form and Function	Kindergarten
1.1	Light and Sound	1 st Grade
1.2	Light: Observing Earth, Sun, Moon and Stars	1 st Grade
1.3	Animal Adaptations	1 st Grade
1.4	Animated Storytelling	1 st Grade
2.1	Materials Science: Properties of Matter	2 nd Grade
2.2	Materials Science: Form and Function	2 nd Grade
2.3	The Changing Earth	2 nd Grade
2.4	Grids and Games	2 nd Grade

Elementary School Program: PLTW Launch

Section	PLTW Launch Module	Standards Alignment
3.1	Stability and Motion: Science of Flight	3 rd Grade
3.2	Stability and Motion: Forces and Interactions	3 rd Grade
3.3	Variations of Traits	3 rd Grade
3.4	Programming Patterns	3 rd Grade
4.1	Energy: Collisions	4 th Grade
4.2	Energy: Conversions	4 th Grade
4.3	Input/Output: Computer Systems	4 th Grade
4.4	Input/Output: Human Brain	4 th Grade
5.1	Robotics and Automation	5 th Grade
5.2	Robotics and Automation: Challenge	5 th Grade
5.3	Infections Detection	5 th Grade
5.4	Infection: Modeling and Simulation	5 th Grade

Benefits of CTE Programs of Study

- Career and Technology Education Programs of Study
 - College Preparatory Academic Curriculum
 - A minimum of 4 credits in a Career Program of Study
 - Work-based Learning Opportunities
 - Course and/or Program Assessments
 - Industry Recognized Certifications/Licenses
 - Grades 9-16 Tech Prep Program Articulation
 - Comprehensive System of Career Development
 - Career Technology Student Organizations

PLTW College Certification Visits

- PLTW requires that all PLTW sites (Engineering and Biomed) participate in a College Certification Visit
 - Conducted during the 2nd year of program implementation for Pre-Engineering sites
 - Conducted when there is enrollment in the 3rd course (Medical Interventions) for Biomedical Sciences sites
- Purpose is to ensure that the program is being implemented with fidelity to the model
 - Professional development of teachers and counselors
 - The implementation of curriculum using required equipment and software
 - The formation of a Partnership Team

College Certification Visits

- In Maryland, the College Certification visit consists of:
 - Self-Assessment
 - Submission of key documents
 - Site Visit
 - Final report
- MSDE staff coordinate visits through the school system's central office
- Visits take about 2.5 – 3hours
 - Consist of classroom observations
 - Interviews with central office staff, school leadership, PLTW faculty, PLTW students, parents and PT members

College Certification Visits

- Visit can result in:
 - Full certification*
 - Provisional Certification*
 - Not Certified

*students are eligible to apply for the college credit
- Reasons schools do not receive full certification:
 - Teachers not delivering the PLTW curriculum
 - Equipment and materials of instruction not available to the students
 - Lack of support and understanding of the program by central office and school-based leadership
 - Counselors not promoting PLTW as a sequential program of study but as individual course electives

I Wish Someone Had Told Me That...

1. PLTW High School Programs are Career and Technology Education Programs of Study– Not a Series or Group of Elective Courses
 - The Technology Education Graduation Credit is a Benefit of the Program Not the Sole Purpose of the Program
 - PLTW And () e.g. Advanced Placement, Band
2. PLTW Provides Students with Opportunities to Earn College Credit in High School and
3. Better Prepares Students to Major in STEM Disciplines

New PLTW Initiatives

- PLTW Alumnae
 - For PLTW students who taken at least 2 PLTW courses
 - Networking opportunities for PLTW high school students to connect with college students majoring in STEM areas
- PLTW is on Linked In
 - Open to all PLTW related professionals and students

Contact Information

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Project Lead The Way Website

www.pltw.org

Stevenson University PLTW Website

www.stevenson.edu/pltw

University of Maryland, Baltimore
County PLTW Website

www.pltwmd.org