Project Lead the Way – Gateway to Technology

GTT at WMS
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Talking Points

• Overview of the MS Program and Curriculum
• GTT at WMS
• Q/A
Program General Info

- Gateway to Technology is the MS Program
- PLTW forms partnerships: UMBC – BCPS
- Curriculum is Thorough and Complete
- Web Support
- Rigorous Teacher Training
Middle School Program

- Project-Based
- Team Approach
- Design and Modeling
- Science of Technology
- Automation and Robotics
- Magic of Electrons
- Flight and Space
Design and Modeling

- Solid modeling
- Design process
- Sketching techniques
- Computer modeling - *Inventor*
- Design briefs
- Create models and documentation to solve problems
- Crane, Dragster, MagLev
Inventor
Science of Technology

- Technology throughout history
- Mechanics of motion
- Conversion of energy
- Use of science to improve communication
- Rube Goldberg Project
Automation and Robotics

• History and development of automation and robotics
• Structures, energy transfer, machine automation, and computer control systems
• Gear Systems and Drive Trains
• Design Challenges using *Fischertechnik* parts
Magic of Electrons

- Hands-on projects
- Science of electricity
- Circuit design
- Sensing devices
- Basic circuitry design and Logic
Flight and Space

- Aeronautics
- Space
- Vehicle Design
- Newton’s Laws of Motion
- Forces
- Rockets
- Propulsion
- Flight
Why is PLTW a Good Fit for WMS?

- A fully developed and rigorous curriculum
- Applies and reinforces concepts in math and science
- Flexibility in Implementation
- Student Responsibility for Learning
- Vertical Model
- Engaging/Problem-Based Learning Model
Who is involved?

- Science Department Chair – 60 students
- Library Media Specialist – 22 Students
- Grade 6 Science Teacher – 110 Students
Implementation of GTT – Alignment with SIP Goals

• Increase Reading Scores
• Increase Math Scores
• Science MSA
• High School Program
Major Projects

• Interdisciplinary Connections
• Reinforcement/Application of Deficit Skills
GTT Units at WMS

- Design and Modeling
- Science of Technology
- Automation and Robotics
Logistics

- Computer Lab and Shop
- Online interaction
- Interactive Notebook
- Frequent Assessments
- “Enhanced” Projects
- E-Portfolio
Intro to Design – PP Ball Launcher

- Intro to the Design Process
- Projectile Motion
- Systems
- Energy and Energy Transformations
- Newton’s Laws
- Simple Machines
10” x 10” Puzzle

- Inventor Basics
- Measurement Skills
- Sketching and Drawing Techniques
- Geometry
MagLev Vehicle

- Advanced Inventor Skills
- Energy Transformations
- Analyzing Motion
- Environmental Science
- Position Paper – Balto/Wash MagLev Proposal
Dragster

- Advanced Inventor skills
- Measurement
- Sketching and Drawing Techniques
- Forces and Motion
- Newton’s Laws
Automation and Robotics

- Energy Forms and Transformations
- Programming using RoboPro
Student Response to GTT

- Frustration
- Engagement
- Passion for Learning
- Test Scores
What is all the Hype? Why does the Model Work?

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Forging new generations of engineers
What is
Project Lead The Way?
Career & Technology Education (CTE)

A national pre-engineering program

Middle School + High School + (Post-Secondary & Business Industry) = increase quality and quantity of graduating engineers
History of
Project Lead The Way
First developed in the 1980’s

A national pre-engineering program

Not-for-profit organization in 1997

Offered in 45 states and the District of Columbia

98 Schools in MD
Project Lead The Way
High School Program
High School Course Program

Foundation:  Introduction to Engineering Design★
Principles Of Engineering ★
Digital Electronics ★

Specialization:  Computer Integrated Manufacturing
                and/or  Civil Engineering and Architecture★
                and/or  Biotechnical Engineering
                and/or  Aerospace Technology

Capstone:  Engineering Design and Development

★ Students can receive 3 college credits for this class!

Note: Course program requires college prep mathematics each year.
Graduation Expectations

- Understand technology as a tool for problem solving.

- Understand the scientific process, engineering problem solving and the application of technology.

- Be prepared for the rigor of college level Engineering or Engineering Technology programs.
Graduation Expectations

- Understand, technological systems as they interface with other systems.

- Use the principles of mathematics in their application to problem solving.

- Communicate effectively using reading, writing, listening and speaking.

- Demonstrate the ability to work in teams.
Project Lead The Way
High School Curriculum
The curriculum is: “Standards Based”

- National Academy of Sciences
- National Council of Teachers of Mathematics
- International Technology Education Association
- National English Language Arts
The curriculum is:

“Comprehensive”

Let’s take a look @
“Introduction to Engineering”
The curriculum is:

- Updated yearly
- Accompanied with a “Virtual Academy”
- Supported by a yearly teacher professional development
PLTW Works….

According to High Schools that Works (HSTW) statistics…

![Figure 1](image)

**Figure 1**

Comparison of PLTW Students’ Mean Scores with a Random Sample of Career/Technical Students from Similar Fields

- **Reading**: PLTW Students - 292, Matched CT Students - 288
- **Mathematics**: PLTW Students - 321, Matched CT Students - 312
- **Science**: PLTW Students - 318, Matched CT Students - 307

**Source:** 2006 HSTW Assessment

**Note:** Differences between mathematics and science scores were significant at $p < .01$ on the $t$ test. Differences between reading were significant at $p < .10$ on the $t$ test.
According to True Outcomes Report to PLTW ….
Senior Students Planning to Attend 2 or 4 year Post-secondary Studies

83%

PLTW Graduates

69%

National Graduation
PLTW Works....

According to True Outcomes Report to PLTW......
Senior Students Planning to Enroll in Engineering or Engineering Technology Post-secondary Studies

68%

PLTW Graduates

10%
National Graduates
Project Lead The Way
Student Projects……
Project Lead The Way
Outside the classroom of CHFHS……
Thank You!!!!!
For additional information go to www.pltw.org