



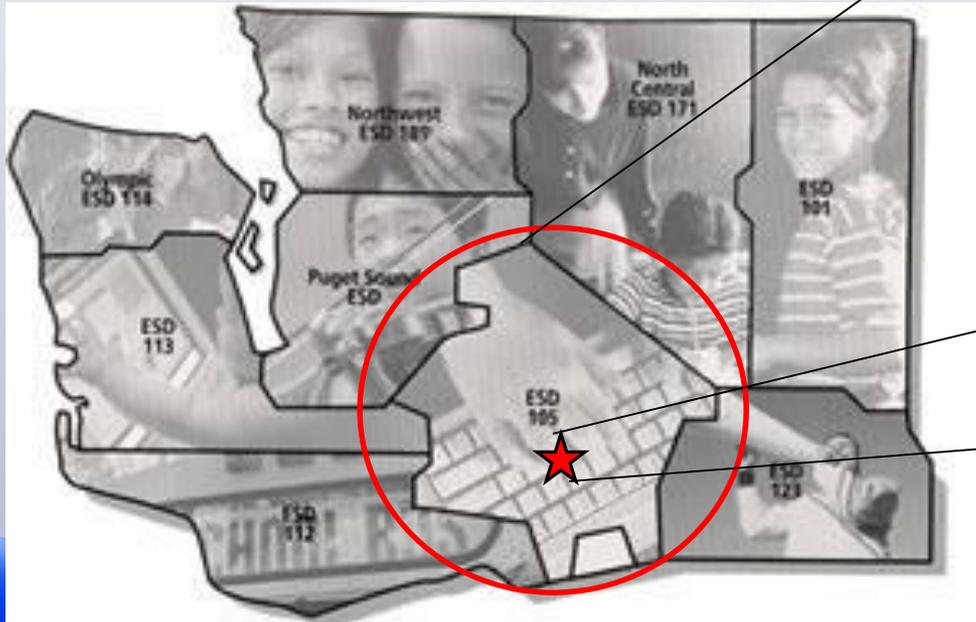
# TOPPENISH SCHOOL DISTRICT

UTILIZING S.T.E.M. TO CREATE A CULTURE  
OF RIGOR, RELEVANCE, AND PROJECT  
BASED LEARNING

John Cerna  
Superintendent

# Overview

- **Rural Agricultural Community in Central WA**
- **Located in the Yakama Indian Reservation**



# City of Toppenish

## TOPPENISH

### *"Where The West Still Lives"*

In the City of Murals and Museums capture a glimpse of the Old West as you climb aboard a covered wagon for a horse drawn tour of Toppenish's 73 spectacular murals.

Nestled in the heart of the Yakima Valley inside the Yakama Nation Reservation, Toppenish offers you a window into the past. Toppenish captures the spirit of yesteryear and the energy of today with fabulous festivals and events. Witness the painting of a new mural during the Mural-In-A-Day on the first Saturday in June. June also marks the commemoration of the signing of the Yakama Nation's Treaty of 1855. Join hundreds of Tribal members as they gather annually for the vibrant Treaty Day parade.

Spend the Fourth of July weekend experiencing the thrill of the Toppenish Pow Wow and Rodeo. Then celebrate our country's independence with a Wild West Parade on the Fourth of July.

Mingle with the finest western artists during the Western Art Show in August.

Our rich history, Native American traditions and cultural diversity create an inviting atmosphere for anyone with a passion for history. Three engaging museums showcase our history. The American Hop Museum chronicles the history of the hop industry, serving as a tribute to all of agriculture. The Northern Pacific Railway Museum takes you on a journey through time to the days of steam driven locomotives. Built in 1911, the depot museum displays vintage rail artifacts and memorabilia.

The Yakama Nation Museum presents the dioramas and exhibits celebrating the heritage of the Yakama Nation. Stories of the Yakamas' way of life are told in lifesize poetry adorning the walls of the museum.

Your stay in Toppenish will be enhanced by endless activities. Take in a round of golf, visit the Toppenish National Wildlife Refuge or stay and play awhile at Legends Casino, featuring full Vegas style gambling.

**2012 Toppenish Events Calendar**

**April 29-May 2:**  
Central Washington Junior Livestock Show

**June 2:**  
Toppenish Mural Society-"Mural-In-A-Day"

**July 1 & 2:**  
Toppenish Pow Wow & Rodeo

**July 4:**  
Wild West Parade

**July 6-7:**  
Toppenish Rodeo and Pow Wow

**August 17-19:**  
Toppenish Western Art Show

**August 24-25:**  
Northern Pacific Railway Museum Rail Show

**September 8:**  
Dinner Train to Nowhere at the Northern Pacific Railway Museum

**October 27-31:**  
Haunted Depot at Northern Pacific Railway Museum

**November 24, Dec. 1, 2, 8, 9, 15, 16:**  
Toy Train Christmas at Northern Pacific Railway Museum

For a complete listing of scheduled events and dates please visit our website at:

[www.toppenish.net](http://www.toppenish.net)

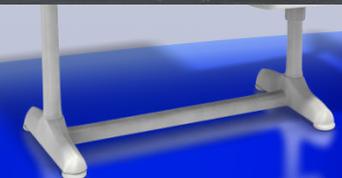
Toppenish Chamber of Commerce  
504 South Elm • Toppenish, WA 98948  
509.865.3292 • 509.865.6375  
Toppenish National Wildlife Refuge, 21  
Pumphouse Rd.  
U.S. Highway 97 S.Toppenish, WA 98948,  
509.865.2405








*In the City of Murals and Museums*







# Demographics

- **84% Hispanic**
- **13% Native**
- **3% White**
- **100% Free Lunch**
- **20.91% Migrant Students**
- **30.55% Bilingual**
- **13.13% Special Education**



# Goal: College & Career Readiness

- Transition to high school was difficult and treacherous
- Freshman were not successful
  - Summer bridge program
  - Advisory class
  - 8th grade visitations
  - Start of school orientations
- Problem persisted
  - Student disconnect
    - Curriculum
    - Expectations



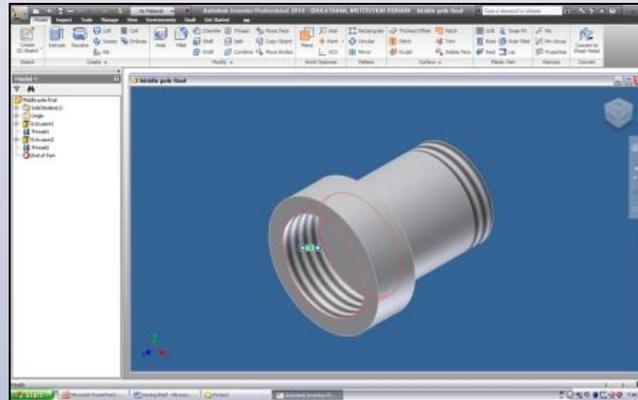
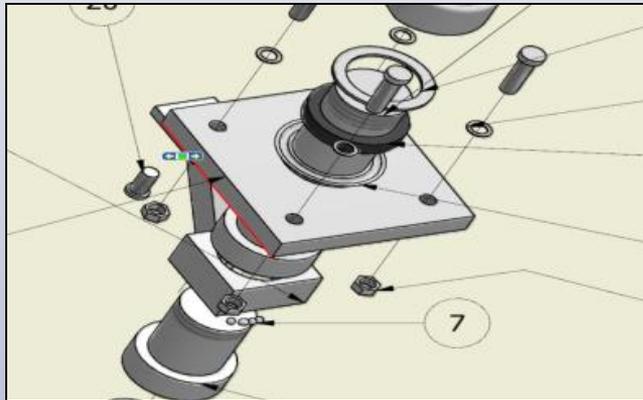
# STEM to the rescue!

- Academic transition
  - Rigorous, engaging curriculum
  - Utilize cutting edge technology
  - Problem/Project based
  - Collaborative in nature
  - Leadership opportunities
  - Network with community & industry
  - Professional communication skills



# Introduction to Engineering Design (IED)

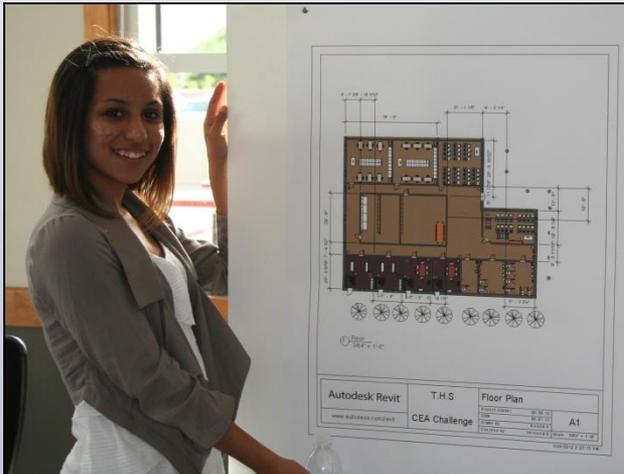
- Technical Sketching (Drafting)
- Schematics
- Design Process
- 3D CAD Development
  - Autodesk Inventor





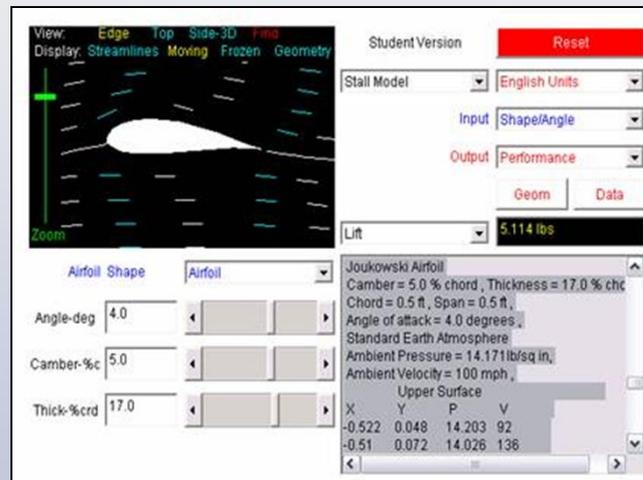
# Civil Engineering & Architecture (CEA)

- Residential Design
- Commercial Applications/Systems



# Aerospace Engineering (AE)

- Flight Simulator
- Aerodynamics
- Rocketry
- Robotics
- Data Analysis



# THS Robotics

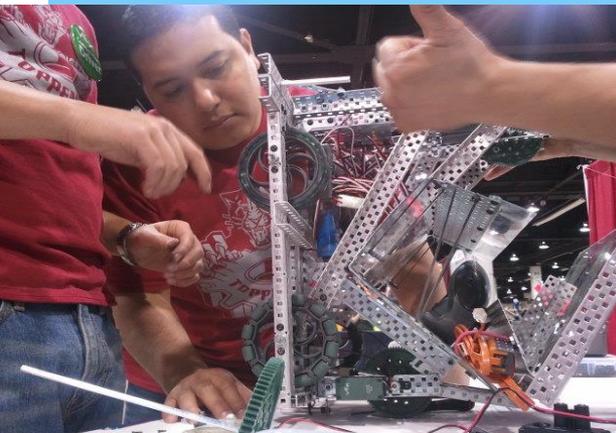
- \* Engineering Extension
- \* Skills
  - \* Mechanical
  - \* Programming
  - \* Team Work
  - \* Communication
  - \* Problem Solving x 10





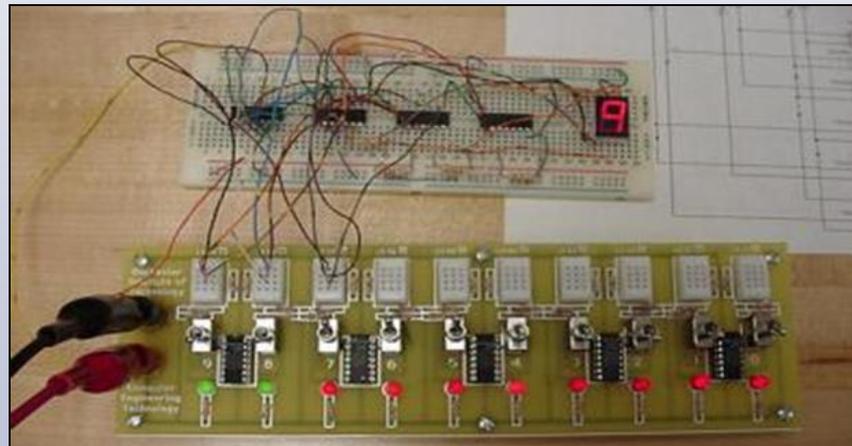
Tournament Champs & Best Design Award

# Trouble Shooting Problems Before A Match



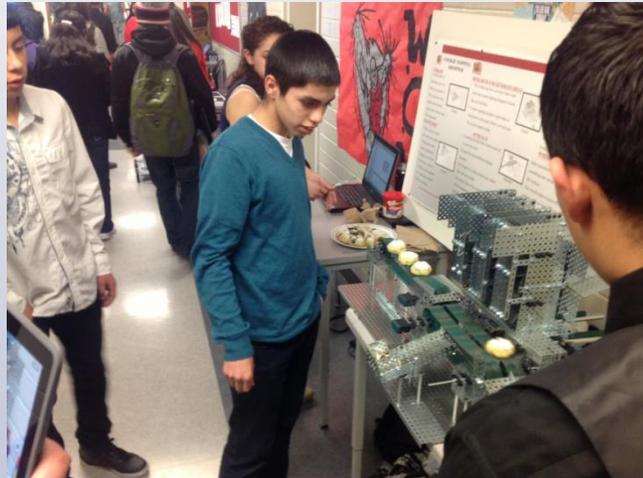
# Digital Electronics (DE)

- Logic Design
- Simulate
- Prototype
- Fabricate
- Technical Documentation
- Electronic devices



# Principles of Engineering Design (POE)

- Simple Machines
- Programming
- Circuitry
- Statics
- Pneumatics
- Hydraulics
- Energy
- Materials





# • Computer Integrated Manufacturing (CIM)

- 3D Computer Modeling
- Computer Numerical Control (CNC)
- Computer Aided Manufacturing (CAM)
- Robotics (Assembly Line Operation)
- Flexible Manufacturing Systems



# • Computer Science Engineering (CSE)

2013-14 Pilot Class

- Graphics
- The Web
- Data Mining
- Simulation



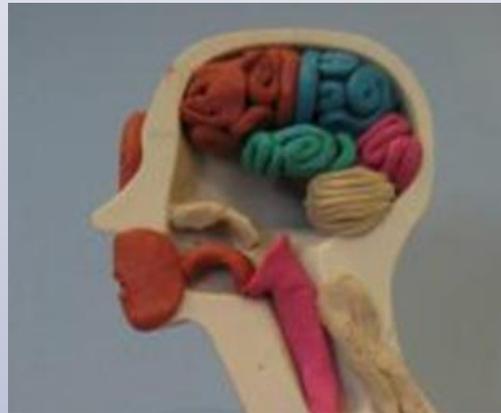
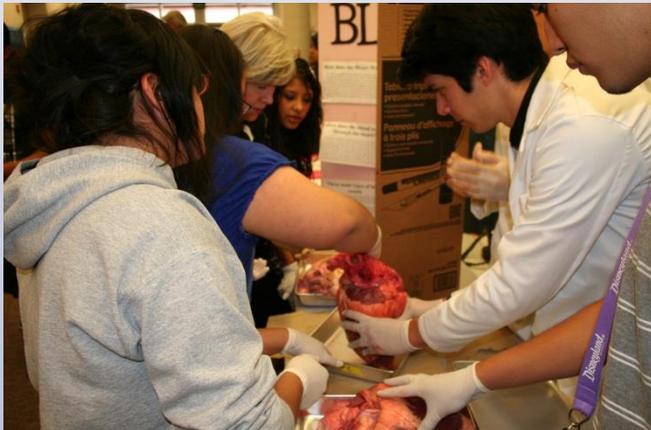
# Principles of Biomedical Science (PBS)

- Cardiovascular Disease
- Diabetes
- Sickle Cell Disease
- Hypercholesterolemia
- Infections Diseases



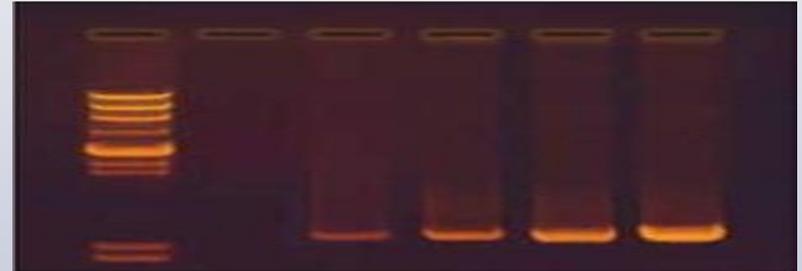
# Human Body Systems (HBS)

- Anatomy
- Communication
- Energy
- Movement
- Immunology
- Body Systems



# Medical Interventions (MI)

- Diagnostics
- Surgery
- Bio-nanotechnology
- Pharmacology
- Prosthetics
- Genetics



# STEM Capstone

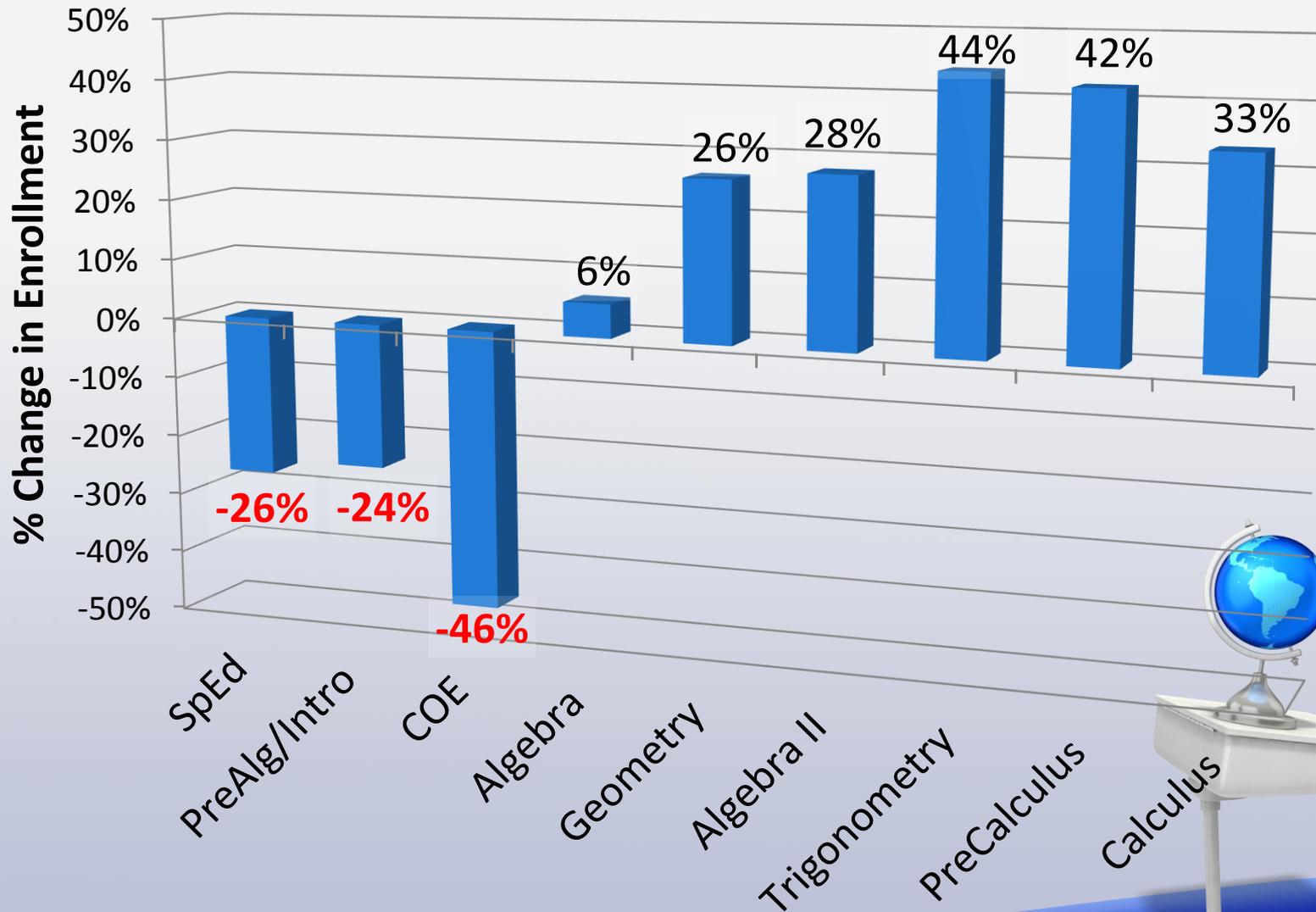
- Phase I
  - Research
  - Project Proposal
- Phase II
  - Design and Development
- Phase III
  - Presentation



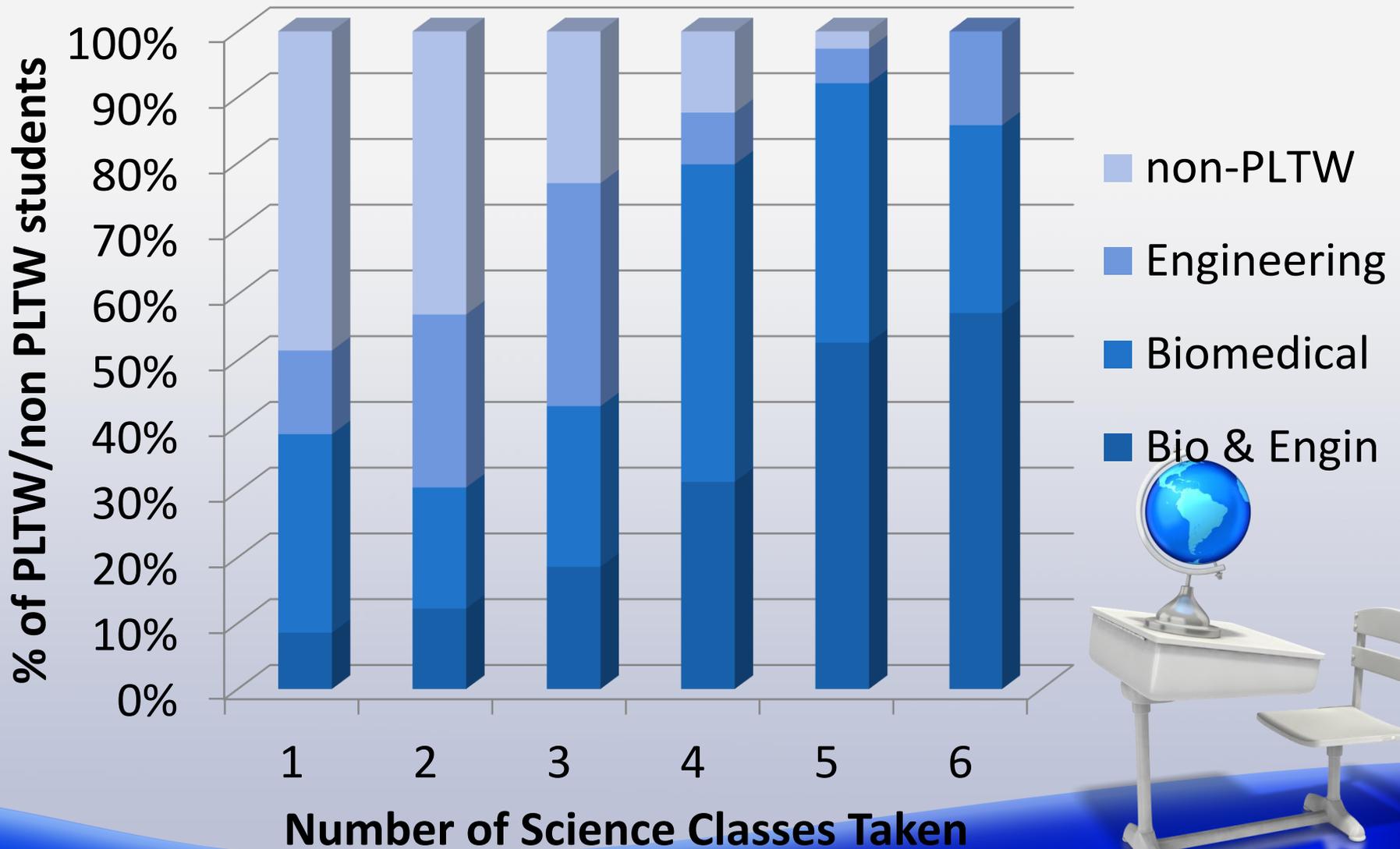
# PLTW Class Data – All PLTW Enrollment 2010-2013

# of All PLTW Classes	Female		Male		Total
<b>1</b>	263	31.80%	249	30.11%	512
<b>2</b>	105	12.70%	117	14.15%	222
<b>3</b>	23	2.78%	44	5.32%	67
<b>4</b>	4	0.48%	13	1.57%	17
<b>5</b>	4	0.48%	3	0.36%	7
<b>6</b>		0.00%	2	0.24%	2
<b>Grand Total</b>	399	48.25%	428	51.75%	827

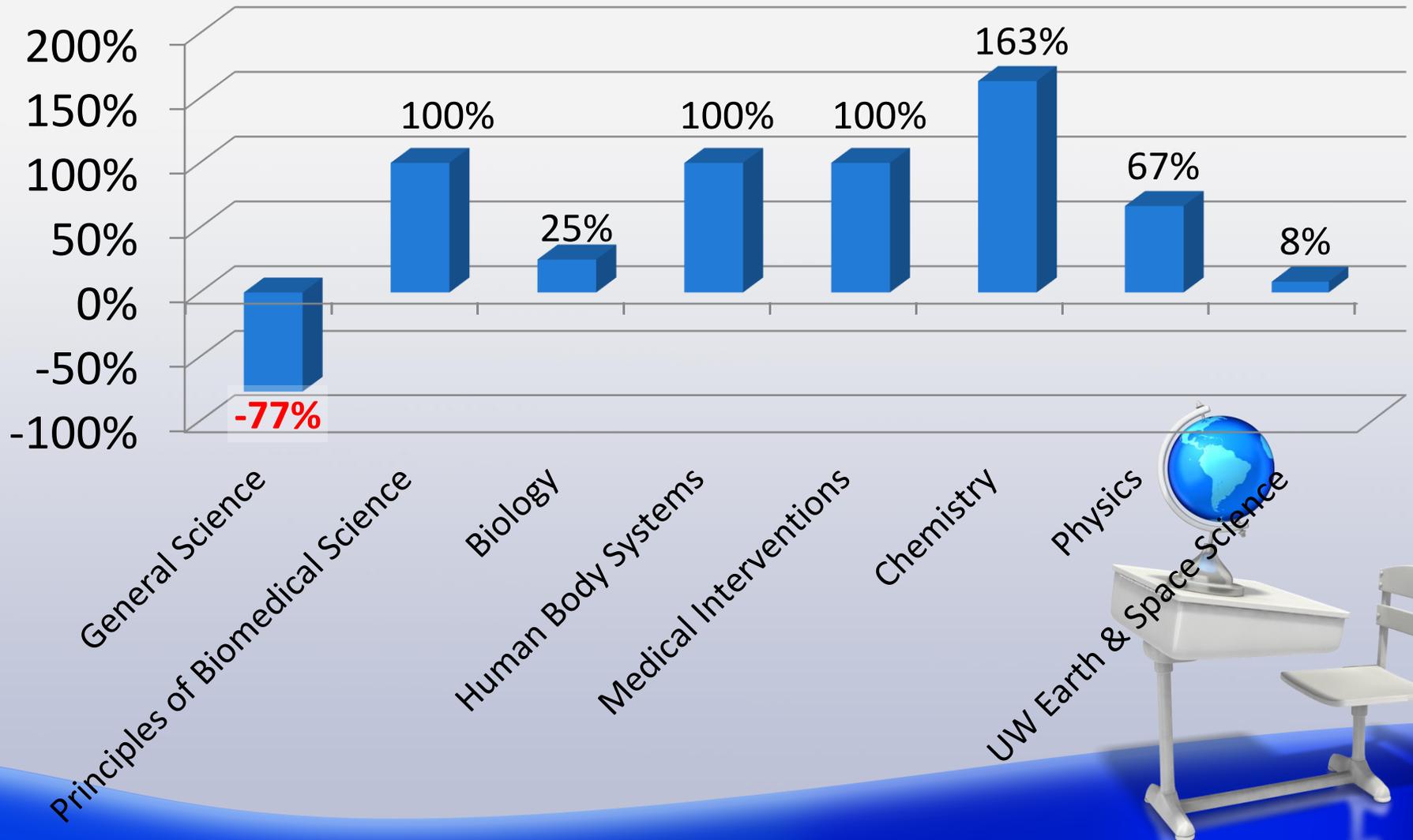
# Change in Math Enrollment 2010-2013



# Number of Science Courses Taken



# Change in Enrollment in Science Classes 2010-2013



Hello :)

# Gateway to Technology I

- Automation and Robotics
  - Energy transfer, mechanical & computer systems
- Design and Modeling
  - Design process, engineering notebook, innovative influence
- Energy and the Environment
  - Design/model alternative energies, evaluate energy conservation



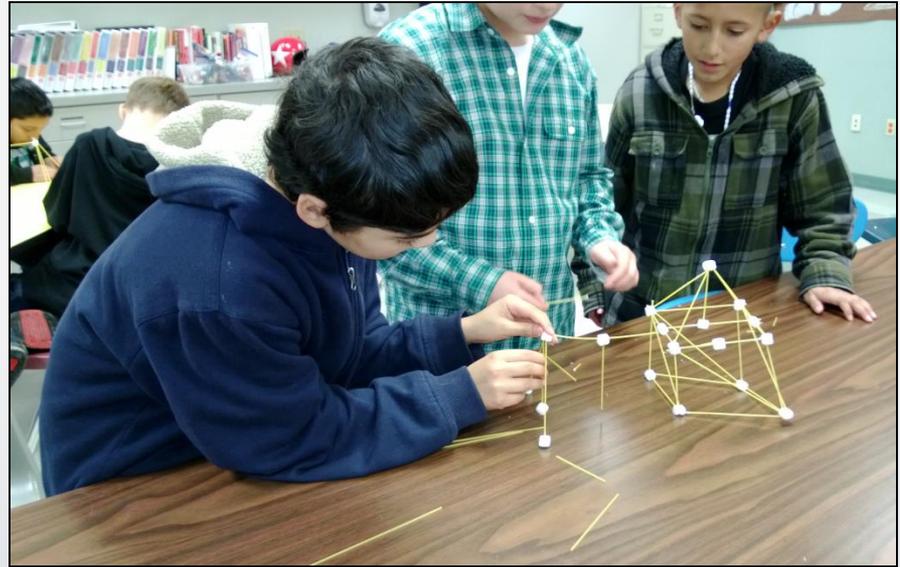
# Gateway to Technology II

- Flight and Space
  - Design, build & test airfoils; Hands-on, research, presentation
- Magic of Electrons
  - Science of electricity & atoms, basic circuitry
- Science and Technology
  - Apply physics, chemistry & nanotech to activities
- Medical Detectives (MD)
  - Medical mysteries, problem solving, treatment, body systems



# TAG STEM Program

- Hands on Mathematics and Science
- Technology Rich
- Simple Machines
- Robotics
- Structures

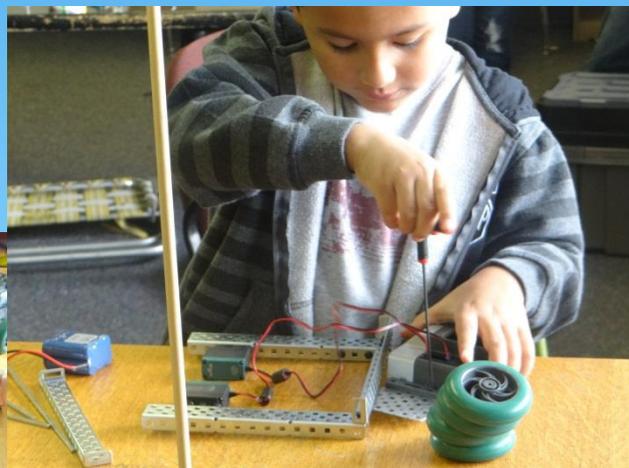


# PLTW Elementary STEM

2013-14 Pilot

- Fall
  - Kinder: Design Process
  - 2<sup>nd</sup>: Matter & Materials
  - 4<sup>th</sup>: Energy (Collisions)
- Winter
  - 1<sup>st</sup>: Waves (Light & Sound)
  - 3<sup>rd</sup>: Motion & Stability
  - 5<sup>th</sup>: Intro To Robotics
- Spring
  - Kinder: Pushes & Pulls
  - 1<sup>st</sup>: Observing The Earth, Sun, Moon, and Stars
  - 2<sup>nd</sup>: Engineering Design
  - 3<sup>rd</sup>: Motion & Stability
  - 4<sup>th</sup>: Energy (Conversion)
  - 5<sup>th</sup>: Robotics Competition





- Success

- Academic transition
- Rigor, relevant courses
- Leadership
- Communication skills

- Graduation Rate

- 79% - 93%

- Enrollment

- 667 - 790



# Closing

- Toppenish High School: 2008 U.S. News & World Silver Medal, Top 3% of high schools in the nation
- Toppenish High School: 2010 Washington Achievement Award
- Toppenish High School: 2011 Washington Achievement Award
- Toppenish High School: 2011 OSPI School of Innovation
- Toppenish High School: 2011 PLTW National Certified Engineering Program
- Toppenish High School: 2011-12 OSPI STEM Lighthouse Award
- Toppenish High School: 2012 KCTS Golden Apple Award (STEM Program) Stanley O. McNaughton Recipient
- Toppenish High School: 2013 Golden Apple Award (Pathway To Excellence) Gates Foundation.
- Toppenish Middle School: 2013-14 OSPI STEM Lighthouse Award
- National Indian Impacted Schools Association, Exemplary Award Toppenish School District
- OSPI Career Guidance Award of Excellence 2013-2014 Middle School
- OSPI Career Guidance Award of Excellence 2013-2014 High School

