“Chevron Corporation and the Project Lead The Way California Network: A Success Story in Action”
Chevron Corporation & Project Lead The Way California Network: The Partnership

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Why Chevron is Engaged: Return on Chevron’s Community Investment

- PLTW has proven success that provides results
- PLTW can develop a long term relationship
- Scalability proven adaptable to states or regions
- Organizational structure provides ongoing access to State Leaders and staff
- PLTW is a collaborative model that includes Community Based Organizations, Community Colleges, California State Universities
- CA Partnership Initiative – PLTW is Chevron’s anchor STEM program in California
THE PLTW SYSTEMS APPROACH

RELEVANT AND RIGOROUS CURRICULUM
Middle and High School
Project/Problem-based

PROFESSIONAL DEVELOPMENT
Core Training Institutes for Engineering at San Diego State, Cal Poly Pomona, San Jose State

PARTNERSHIPS
Schools/Universities/
Business & Industry
CHEVRON CA/PLTW
Current Statistics PLTW:

- 400,000+ students,
- 4200+ school sites, 4500+ programs
- 50 states & District of Columbia,
- 10,500 trained teachers/18,550 total credits granted
- 40 Affiliate Universities/100 university relationships
- 30% Annual Growth over last 5 years
PLTW Growth in California
2000—2011
MIDDLE SCHOOL CURRICULUM: GATEWAY TO TECHNOLOGY
Middle School Program
Gateway To Technology

➢ GTT Foundation Units:
  ▪ Design and Modeling
  ▪ Automation and Robotics

➢ GTT Specialization Units:
  ▪ Energy and the Environment
  ▪ Flight and Space
  ▪ The Science of Technology
  ▪ The Magic of Electrons
  ▪ *Green Architecture (2012-13)
HIGH SCHOOL CURRICULUM:
PATHWAY TO ENGINEERING
Pathway to Engineering

Foundation Courses:
- Introduction to Engineering Design
- Principles Of Engineering

Specialization Courses:
- Aerospace Engineering
- Biotechnical Engineering
- Civil Engineering and Architecture
- Computer Integrated Manufacturing
- Digital Electronics

Capstone Course:
- Engineering Design and Development
Teacher training opportunities, conferences & seminars throughout the year in various cities near you.
Spring 2011 stats: 98 student design teams with over 324 members
## Linking Education & Economic Development (LEED) of Sacramento Regional PLTW Partner

<table>
<thead>
<tr>
<th>Overview of LEED/PLTW Region</th>
<th>PLTW Current Program</th>
<th>PLTW Growth 2012-13</th>
<th>PLTW Chevron/LEED Efforts</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEED is a non-profit partnership:</td>
<td>PLTW grew from 25 schools to 32 for 2011-2012</td>
<td>Anticipating 8 to 10 new schools</td>
<td>2011 LEED hosted 1st PLTW Affiliate meeting and Legislative Breakfast</td>
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<tr>
<td>▪ Businesses such as Chevron, Intel, Aerojet, Teichert, Sprint, Roebbelen, SMUD, North State BIA, Safe Credit Union</td>
<td>125 teachers trained for PLTW region</td>
<td>Anticipate training 8-10 new teachers</td>
<td>2012 hosting 1st Statewide PLTW Conference</td>
</tr>
<tr>
<td>▪ Education at all levels from K-12 to post-secondary institutions.</td>
<td>Chevron funds Capital Network of PLTW Schools</td>
<td>Support PLTW Engineering Design Challenge</td>
<td>Inform policy on STEM education</td>
</tr>
<tr>
<td>LEED Supports the PLTW Capital Region Network of Schools</td>
<td>5000 students impacted</td>
<td></td>
<td>Raise public awareness of PLTW and STEM education</td>
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</table>
What is PLTW?
PLTW is a nationally recognized project-based curriculum serving over 350,000 students in all 50 states. It is easy to implement, meets A-G requirements, and is meant to appeal to students of all types, even those who seem uninterested in STEM fields.
PLTW also offers support for English language learners.

PLTW In California
+232 Schools
+25,000 Students

PLTW Success
+ Better student preparation
+ Increases number of underrepresented students in STEM
+ Platform for partnerships with K-12
+ Enhances student retention (80% vs. 60%)

What does the Capital Region PLTW Network Do?
+ Enables PLTW teachers to share best practices
+ Connects teachers with employer partners
+ Promotes PLTW to students and parents
+ Offsets the cost of equipment and teacher training

Get Involved!
Co Host a field trip to your company
Speak at a career day
Donate equipment, money or knowledge
Serve on the Capital Region Advisory Board
Contact Linde Christopher
lchristopher@leed.org
916.321.9116

Major Supporters:
- SMUD
- Roebelen
- Aerojet
- Teichert
- Intel
- Chevron
<table>
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<tr>
<th>PLTW Greater East Bay</th>
<th>PLTW 2011-12</th>
<th>PLTW 2012-13</th>
<th>CCEP Philanthropic Award</th>
</tr>
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<tbody>
<tr>
<td><strong>CCEP Strategy:</strong></td>
<td><strong>Current Programs:</strong></td>
<td><strong>Proposed Growth:</strong></td>
<td><strong>Recognition of Chevron’s leadership in expanding schools’ focus on Engineering and the development of a workforce pipeline for the region.</strong></td>
</tr>
<tr>
<td>Cadre of core academic and PLTW-trained CTE teachers with student cohorts</td>
<td>13 School Sites</td>
<td>4 additional School Sites</td>
<td></td>
</tr>
<tr>
<td>Small learning communities</td>
<td>1199 Students Engaged</td>
<td>5 new classes included</td>
<td></td>
</tr>
<tr>
<td>Focused on healthcare, biotechnology, engineering and environmental studies.</td>
<td>10 new classes added to existing schools</td>
<td>210 Students Engaged</td>
<td></td>
</tr>
<tr>
<td></td>
<td>325 additional students engaged</td>
<td>Total of 1630 Students to be served in East Bay</td>
<td></td>
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# Bakersfield/Kern County Chevron PLTW Partnership

<table>
<thead>
<tr>
<th>Kern High School District Overview</th>
<th>PLTW Current Program</th>
<th>PLTW Growth Plan</th>
</tr>
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<tbody>
<tr>
<td>Kern HSD, largest district in California</td>
<td>Successfully implemented, expanded, and sustained total of 8 school sites</td>
<td>The 5 Kern High Schools will add courses to their engineering sequence</td>
</tr>
<tr>
<td>37,000+ students</td>
<td>5 of the 8 high schools represent diverse geographic areas.</td>
<td>Middle Schools will add second level of GTT</td>
</tr>
<tr>
<td>24 schools</td>
<td>3 middle schools have implemented GTT</td>
<td>Serving 300 students</td>
</tr>
<tr>
<td>Opportunity to make a significant difference</td>
<td>All schools exceeded enrollment expectations with overwhelming demand from the students and parents to support the program.</td>
<td>Anticipating over 1,000 students to be served within two years</td>
</tr>
</tbody>
</table>
## Cal Poly Pomona University PLTW Affiliate

<table>
<thead>
<tr>
<th>PLTW Growth in CPP Service Area</th>
<th>CPP Engineering Freshmen from PLTW And % enrolled</th>
<th>CPP PLTW Outreach and Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2002-03:</strong> 3 PLTW Schools in region</td>
<td><strong>Fall 2009:</strong> 74 PLTW Freshmen enrolled—9% of class</td>
<td>Information Sessions Quarterly at CPP--over 225 attendance 2010-11</td>
</tr>
<tr>
<td><strong>2010-11:</strong> 128 PLTW schools in region</td>
<td><strong>Fall 2010:</strong> 76 PLTW Freshmen enrolled—13% of class</td>
<td>Society of Hispanics in Science &amp; Engineering (SHSE) outreach to high schools</td>
</tr>
<tr>
<td><strong>2011:</strong> 91 PLTW teachers trained at Cal Poly Pomona</td>
<td><strong>Fall 2011:</strong> 135 PLTW Freshmen enrolled—19% of class</td>
<td>Society of Women Engineers outreach to high schools</td>
</tr>
<tr>
<td><strong>2011-2012:</strong> 8 PLTW Chevron-funded High schools</td>
<td></td>
<td>Core training and refresher training for PLTW teachers</td>
</tr>
</tbody>
</table>

**PLTW Engineering Design Challenge**
CPP Engineering First Time Freshmen From PLTW Schools

- Fall 2009: 74
- Fall 2010: 76
- Fall 2011: 135
Percent of CPP Engineering First Time Freshmen From PLTW Schools

- Fall 2009: 9%
- Fall 2010: 13%
- Fall 2011: 19%
Project Lead The Way
For Newer Generations of Engineers

Project Lead The Way at Cal Poly Pomona
Cal Poly Pomona is partnering with Project Lead The Way to create dynamic partnerships with local schools to prepare an increasing and more diverse group of students to be successful in engineering programs. Download the Program Flier.

The College of Engineering hosts numerous events for educators throughout the year.

- About PLTW
- Information Conferences
  - Next Information Conference: January 27, 2012
- Core Training
- Core Training Refresher Workshop
  - Next CT Refresher Workshop: March 2012
- How to Start PLTW at Your School

Registration Will Open for Summer Core Training 2012 Mid-March 2012

Forging New Generations of Engineers

Students participating in PLTW courses are better prepared for college engineering programs and more likely to be successful, thus reducing the attrition rate in these college programs, which currently exceeds 50 percent nationally.

"PLTW has paved the road for me to be a civil engineer succeeding at Cal Poly Pomona by giving me the essential starting tools that are necessary to think like a great engineer."

-Christopher Aguilar,
Civil Engineering Senior
Completed 4 years of PLTW courses
San Jose State University PLTW Affiliate
Engineering Pathways to Success—EPS

<table>
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<tr>
<th>Components of the EPS Initiative</th>
<th>PLTW in SF Bay Area &amp; Silicon Valley</th>
<th>PLTW Outreach and Support</th>
</tr>
</thead>
</table>
| Support/coordinate middle/high school adoption and implementation of PLTW program | In 2010-2011:  
  - PLTW San Jose served 2,028 students  
  - 23 school sites  
  - total of 68 courses, with 9 different PLTW courses in place | Engineering students outreach to schools with Ambassador Program |
| Train new and experienced PLTW teachers in engineering concepts and skills | In 2011-2012:  
  - An additional 14 schools began PLTW in the Fall of 2011 | First Core Training in Summer 2011 |
| Intensive summer bridge programs for new SJSU engineering students | Held two PLTW Information Sessions 2010-11 | Held two Best Practices Workshops for PLTW teachers |
|                              |                                      | PLTW Engineering Design Challenge |
San José State University
Engineering Pathways to Success
Project Lead The Way
Annual Report--24 October 2011

The SJSU Engineering Pathways to Success initiative leverages an already successful national model: the Project Lead the Way (PLTW) engineering program for middle and high schools, which has been implemented in over 4,000 schools across the nation.

- PLTW curriculum, integrated with math and science, motivates student engagement through project-based learning.
- The Engineering Pathways initiative trains middle and high school teachers to teach engineering concepts and skills in Silicon Valley.
## El Segundo/El Camino CC Overview

- **El Camino has strong engineering and technology programs in CA with PLTW coursework embedded**
- **ECC has chosen PLTW for outreach to local high schools**
- **Fall 2011, more than 1,700 HS students in PLTW courses in ECC service area**
- **1,400 enrollment in HS PLTW courses 300 concurrently enrolled for college credit**

## PLTW Current Program

- 8 High Schools currently funded by Chevron
- 2 Middle Schools currently funded by Chevron
- Chevron engineers mentor teachers and students, serve as judges for competitions and project evaluation
- 30 high school PLTW courses articulated to ECC for college credit.

## PLTW Growth Plan Proposed

- Provide partial support for ECC PLTW Coordinator
- Expand current PLTW program by 7 new classes for a total of 22
- Add one high school and two middle schools for 2012-2013
- Support regional PLTW Engineering Design Competition
PLTW @ ECC Program Progression

- PLTW has a proven track record of success in promoting courses in STEM subjects for middle and high school students.

- Why should a community college engage with PLTW?

- What is working?
  - Robotics
  - PLTW
2007 SB-70 “Quickstart” Grant to replicate Hawthorne HS model

2007 to 2009, sponsored 7 high schools with More than 1,000 high school students enrolled in PLTW courses in the South Bay

2008 ETEC Program Approval Approved
  - Two A.S. degree options
  - Two certificate options
PLTW @ ECC Program Progression

- 2009/2012 Chevron USA and El Segundo partnership
  - Two new high schools
  - Chevron engineers mentor and support programs
  - IED Competitions
  - ECC coordinator support

- 2011 Spring/Summer Activities (Funded by Chevron, Northrop Grumman and CTE grants)
  - Six new GTT schools added
  - Three high schools big expansion
  - 14 teachers completed Core Training
Hawthorne High School of Engineering and Manufacturing
Los Angeles Named Exemplary by SME Foundation

School of Engineering students engage in STEM through hands-on, project-based learning.
# Replication of Partnership Model: Texas and Louisiana

<table>
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<tr>
<th>Houston, Texas: Southwest Schools</th>
<th>Louisiana: St. Tammany Parish/Plaquemines Parish/Orleans Parish</th>
<th>Texas/Louisiana Growth Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically designed PLTW engineering lab new building</td>
<td>Six Middle Schools funded; two each Parish</td>
<td><strong>Texas:</strong> Offer all 6 MS units and 4 HS courses in next 3 years</td>
</tr>
<tr>
<td>Offering GTT for Middle School</td>
<td>Provided lab equipment, computers, teacher training</td>
<td><strong>Louisiana:</strong> All teachers trained for three additional units Summer of 2012</td>
</tr>
<tr>
<td>Offering POE for High School</td>
<td></td>
<td><strong>Additional equipment funded for 2012-13 for all six schools</strong></td>
</tr>
</tbody>
</table>
VALUE ADDED AND RETURN ON INVESTMENT FOR CHEVRON

1. Increased the number of schools teaching the PLTW curriculum, and expanded PLTW programs at existing schools.

2. Provided meaningful ways for Chevron personnel to participate in this effort in all of the regions.

3. Increased public awareness of PLTW and Chevron’s efforts in each of these regions.

4. Developing a long-term relationship that benefits both parties but whose primary goal is improve STEM (Science, Technology, Engineering and Math) education in the state of California.
With new $60,000 lab, Richmond High is training a new crop of engineers

Richmond High School now has a new state-of-the-art computer lab that will provide students with intensive engineering training. The lab is the result of a wide-ranging partnership between the school, the City of Richmond, the West Contra Costa Unified School District, Chevron, and Project Lead the Way.

Chevron is now investing $2 million to establish PLTW programs in California, with specific focus on Contra Costa County as well as other parts of California where Chevron has a major presence. As a result of this investment, many schools in the county have access to valuable resources such as teacher training and new technology to implement PLTW courses.

Few factors are more critical to California’s competitiveness than college graduates with degrees in science, technology, engineering and math (STEM). As a California-based company, Chevron is committed to helping prepare today’s youth for 21st century jobs. In 2009-2010, we invested over $10 million in STEM education in California, reaching 3,900 teachers and 245,000 students.

Project Lead the Way student Samori Roberts (on right) gets a "high five" from Winston Saelinh after demonstrating the workings of his Robot, as Winston's sister Tiffany looks on.

few schools in the county have access to valuable resources such as teacher training and new technology to implement PLTW courses.
Your Questions, please!