Education & Training Committee

• Overview of purpose and structure

• Update on State Youth Council

• Update on Career Pathways
Colorado Workforce Development Council

Executive Committee
Private Business Members:
Officers: Chair; Past-Chair; Chair-Elect; Treasurer; Secretary
Committee Chairs: Advocacy, Sectors, Education/Training
Public Leadership Members:
Exec. Directors of Higher Education, Labor/Workforce and Economic Development

Advocacy Committee
Chaired by Industry
Lead Staff – Stephanie Steffens
- Policy / Legislative Cmte
- Marketing (Awareness)
- Communications

Sectors Steering Committee
Chaired by Industry
Lead Staff – Emily Lesh
- Sector Partnerships
- Key Industry Networks
- Office of Economic Development
- Business Services Integration

Education & Training Committee
Chaired by Industry
Lead Staff – Rebecca Waldo
-- Angela Baber, CO Legacy Foundation
- Career Pathways System
- State Youth Council
- STEM Action Plan

Colorado Blueprint Core Objective V: Creating the Workforce of the Future

Committee Responsibilities
- Represent Colorado Business & Industry as Advisory Councils
- Advise the work and ensure integration of the operational committees
- Convene Government Leaders around key issues and decisions to build support and follow-through
- Report to the Executive Committee and full CWDC

Strategic Focus Areas
- More Colorado Jobs & Employment
  - Increased Capital Investment
- Talented & Competitive Workforce
  - Customer Satisfaction
  - Increased Employment Diversity

Members & Partners
Led by Colorado businesses, and driven by a powerful collaboration of state agencies, regional & community organizations
STEM Panel

Moderated by Josh Davies

Panelists:
Rebecca Waldo, CWDC
Scott Nielsen, Principal, Preston Middle School
David A. Prawel, PhD, Director, Idea-2-Product Lab for Advanced/Additive Manufacturing, Colorado State University
B.J. Lopez, Woodward
Preston Middle School

A Neighborhood STEM School:
a place to pursue your PASSION!!
What is the Mission:

**INSPIRE**

**ENGAGE**
How Will YOU Make The World Better?

STEM SCHOOL

RIGOROUS CURRICULUM

EXPLORATION AND DISCOVERY

RESEARCH AND SERVICE

CHALLENGING EX-CURRICULAR

PROFESSIONAL COLLABORATION

2011 Intel School of Distinction

ELITE SMART Showcase School

PRESTON SCIENCE, TECHNOLOGY, ENGINEERING & MATH
## STEM Touches

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SeaPerch: Underwater Robotics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team America Rocketry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Intro to Chemistry</td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-STEM</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>80</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Astronomy</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Tech Challenge</td>
<td></td>
<td></td>
<td>10</td>
<td>10</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco/Zoo/Oceanography</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
<td>40</td>
<td>80</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Intro to Biotechnology</td>
<td>75</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visiting Scientist Lunches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Conferencing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>250</td>
<td>550</td>
</tr>
<tr>
<td>Robotics Semester class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robotics Quarter Class</td>
<td></td>
<td></td>
<td></td>
<td>45</td>
<td>85</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Science Olympiad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flight Simulator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEM Summer Institute</td>
<td>30</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science Fair/Grand Challenge</td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>45</td>
<td>45</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>First Lego League</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45</td>
<td>550</td>
</tr>
<tr>
<td>MathCounts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Growth Totals</strong></td>
<td>25</td>
<td>35</td>
<td>281</td>
<td>856</td>
<td>1766</td>
<td>2085</td>
<td>3026</td>
<td>3245</td>
</tr>
</tbody>
</table>
Become an agent of change
Discover untapped resources
Engage and inspire students
Spoil educators
Ian Fogarty is a classroom teacher at Riverview High School, in New Brunswick Canada, where he teaches Chemistry, Physics and Science 12. Over the past few years, Ian has been particularly interested in how 1:1 technology, probeware, virtual labs and SMARTBoards function in a collaborative classroom to help deeper learning and make connections to the outside world. His research is known as "The Fogarty Study".

Jon K. Price Program Manager, Research and Evaluation Intel Corporation, Corporate Affairs Group. Jon K. Price has been managing the education technology program evaluation efforts for Intel’s global K-12 education initiatives since 2003. In 2008 his responsibilities expanded to include additional research and evaluation into how effective integration of technology into multiple levels of education can impact teaching, learning, education reform, and economic growth.
Preston Middle School

A Neighborhood STEM School: a place to pursue your PASSION!!

2011 Intel School of Distinction

SMART Showcase School

PRESTON

Science, Technology, Engineering & Math
Speeding Innovation, Creativity & Product Development

David Prawel, Ph.D.
Director, Idea-2-Product Lab
CSU Mechanical Engineering
3D Printing in...

- Apparel
- Construction
- Health/Exercise Science
- Interior Design
- Education

Housing Development

Apparel

Interior Design

3D Printed Walls & Buildings
3D Printing in Art
3D Printing in Music

- Fully-functional Guitar
- Trumpet
- 3D printed violin
- 3D printed flute
3D Printing in...

For example,
- History
- Communication
- Anthropology

Ancient statue

12th century Egyptian replica

Chinese artifact
3D Printing in...

- Computing
- Biochemistry
- Biology
- Chemistry
- Physics

Nano-devices

Molecules

Labware
3D Printing in Business

- Entrepreneurship
- Marketing
- Finance & Real Estate
- Innovation

Real Estate

Real Estate Planning

New product prototyping

Marketing
3D Printing in Natural Resources

- Ecosystem Sciences
- Conservation
- Forest and Rangeland
- Geosciences

3D printed terrain model

3D printed river basin

Crystals

Wood with tree rings
3D Printing in...

- Agricultural and Resource Economics
- Animal Sciences
- Bioagricultural Sciences and Pest Management
- Horticulture and Landscape Architecture
- Genomics and Molecular Biology
- 3D printed DNA
- Landscapes
- 3D printed meat
- Tree models
What is the I2P Lab?

- A community-access facility
- For innovation and rapid-cycle product development
- Using 3D printing & other advanced manufacturing technology

Watch [video] on how 3D Printing works
Mission

- Enable Innovation
- Accelerate Economic Development
- Enhance Education (industrial, workforce, academic, STEM)
- Expand R&D for local companies
12 Ways We’re Empowering...
I2P Lab – Current Status

- Opened late-April, 2013
  - Two sites: ENG and library
- 12 printers ~$140K value
- One FT manager + 4 student hourly staff
- ~1600 projects to date, nearly 200 certified users, ~20 paying customers
- Training ~20 new users per week
A Game Changer for Colorado

- **Enables Innovation**, faster and cheaper
- **Empowers people**: move faster on ideas, speed design cycles, quick prototypes and products, and get products to market faster
- **A critical component of successful growth for CO businesses**, enabling greater sustainment, new job growth, and increased financial stability of our region as a whole
Enhancing Innovation, Education and Economic Development

World's first 3D printed airplane

David Prawel, PhD
Mechanical Engineering
david.prawel@colostate.edu
970-402-7776 (mobile)
970-491-4386 (office)
Who am I?

• **Who are important to me as an Engineer**
  - Those that recognized skills that I didn’t know I had.
  - Those that promoted the value I provided to a team.
  - Servant Leaders.

• **My Purpose…**
  - Approaching the world with a broad & open mind.
  - Promoting the well being of others and their success.
  - Leading with a sense that my success will bring success to others and visa versa.

*Needing to learn - Wanting to teach – Courage to lead*
Who is Woodward?

• Woodward
  - Woodward integrates leading-edge technologies into fuel, combustion, fluid, actuation, and electronic control systems for the aerospace and energy markets.

• What I do here
  - Simulation Modeling
  - Product Design
  - Customer/Supplier Relations
  - Test and Test Equipment Design
Values - The Woodward Constitution

WHY WE ARE HERE

Woodward enhances global quality of life and sustainability by optimizing energy use through improved efficiency and lower emissions.
Stakeholder Philosophy

Shareholders: Ultimate control and direction of the company is vested with the shareholders as exercised through the Board of Directors. Our goal is that shareholders will receive a return that, in the long run, represents a superior investment.

Customers: We are passionate about customer satisfaction, a critical measure of our success. We are committed to honesty and integrity when dealing with our customers. Through our members and technology, our goal is to provide the highest value and quality systems, components and services that contribute to our customers’ success.

Members: We promote an ethical environment that fosters growth, encourages self-development, and provides meaningful work. All members participate in our success through an attractive total compensation plan. There is clear alignment in incentives between all members and the management team.

Suppliers: Our success is strongly linked to the performance of our supply chain. We are invested in our suppliers and value long-term relationships based on shared business practices. We strive to maintain a balance of short- and long-term objectives important to both Woodward and our suppliers.

Community and Corporate Citizenship: We believe Woodward does more than provide jobs in the communities in which we operate. We are deeply committed to supporting programs and organizations that ensure our communities are desirable places to live and work. We cultivate a spirit of volunteerism by encouraging our members to be involved in their communities.
Vision
Our New headquarters
Woodward Lincoln Campus (WLC) - Site Overview

- **101 Acres – Link-N-Greens Golf Course**
  - 30 Acres donated to the City of Fort Collins for Poudre River Trail Development
  - 3 Historical Landmarks to be integrated into the design

- **Phase 1 – ~400K sq. ft.**
  - Industrial Turbomachinery Systems - Occupancy ~2016
    - Fluid Systems Operations
    - Electronic Controls & Systems Operations
    - Engineering, SG&A and Supporting Staff
    - (Operations) Process Support Building
Ultimate Goals of the WTC ITS Campus

• To design and build a flexible, motivating, collaborative work environment for all Woodward members
  ▪ Reflective of the Woodward Brand and what it means to our members and community
  ▪ Enable an environment of innovation and collaboration to provide solutions for tomorrow’s energy challenges
  ▪ Enable us to retain and recruit top talent now and in the future

• Provide an environment which supports best in class implementation of lean methodologies in a high mix/low volume manufacturing environment
  ▪ Customers experience our ability to innovate, design, manufacture and support leading edge products and solutions
  ▪ Provide customers a facility where they can witness, first hand, the commitment Woodward has for developing and manufacturing leading edge technology
Guiding Principles

- Supportive of our Core Values and Principles
- Sustainable, safe and environmentally friendly workplace
- Visually open and collaborative environment
- Workflow Supportive - Product Lifecycle Process and Lean
- Capable of supporting growth plans
- Flexible to adapt to changing business conditions and requirements
- Respectful of our Community and environmental responsibilities
Exterior Design Details
Workplace Concepts

Design of the office space to better leverage of intellectual capital.

Four work modes:
• Focus
• Collaborate
• Learn
• Socialize
Circulation with Exchange Zones
STEM Approaching the Problem
Woodward STEM - Mission Statement

• Woodward believes STEM is a way of teaching a set of skills to enable people of all ages to be a successful, valuable and effective working professional.

• Our goals are to:
  ▪ Assist in the education of our future workforce from elementary school to continuing education through focused learning experiences.

  ▪ Provide a professional industry presence to keep educational programs focused and communicating effectively.

  ▪ Become a catalyst for learning and influence the education system without authority.
Value Based Approach

• Problem – We need to adjust what and how we educate, to produce skilled, talented and creative people that can contribute to our community, culture and nation to address the threat to our economic prosperity.

• Strategic Approach
  ▪ Examine the Investment Landscape
  ▪ Recognition and reinforcement of 21st Century Skills

• Create a data driven analysis to investment
  ▪ Who’s an investor?
  ▪ Who’s in the value chain?
  ▪ Where should we focus?
Poudre School District Ends Policy 1.1 + Others

- Work Ethic
- Global and Cultural Awareness
- Personal Responsibility
- Creativity and Innovation
- Critical Thinking and Problem Solving
- Find and Use Information/Information Technology
- Civic Responsibility
- Communication
- Collaboration
- +Financial Literacy
- +Flexibility and Adaptability
- +Productivity and Accountability
- ++Leadership
How STEM + 21st Century Skills Relates to Industry

• Some of My thoughts
  ▪ Critical Thinking Skills = **Insight** through **Observation**, Listening
  ▪ Jobs today vs. Jobs of Our Parents
    ▸ The generation gaps
  ▪ Innovation – Change, Creativity, Ideation, Value
  ▪ Systems – Soft Skills, Big Picture, Complexity, Risk
  ▪ Quality – Details, Forward thinking, Robustness, Customer Satisfaction
  ▪ Communication/Collaboration – Expression, Passion, Teamwork

Humanistic Psychology
Abraham Maslow
Ways of thinking outside the bun

- Create collisions of people that don’t normally meet.
- Expressing emotions and acting on passion.
- Staying positive and open to ideas.
- Implicit Trust – Inclusion.
- Happiness and Joy.
- Curiosity.
- Altruism – Empathy.
- Gratitude – Humility.

Fail Fast – Fail Often – Fail Forward – Fail Cheap
Identification of STEM Investors

- Four primary STEM partners are identified:

  - Non-Profits
  - Educational Institutions
  - Industry
  - Government

Identify the Strengths that each investment partner brings to the table.
Derive Areas of Strategic Focus

- Utilize strategic investment tools to guide decisions

**Identify the trends in categories correlated to positive STEM attributes and rank their strength.**

**Determine where the bang for the buck is, maximize influence and return on investment.**
Identify the Value Chain

• Who is a STEM Customer and why is STEM valuable to them?

Develop who lies within the STEM value chain.

Work to establish strategic goals that focus on these key “customers”.

K-12 Students  College Students  Workforce  Continuing Education
Bring the Plan to Life

Put it all together and test the hypothesis.

Question the validity of our assumptions and vet out risks.

K-12 Students  College Students  Workforce  Continuing Education
Phase II

• Generate a sustainable business plan to support the strategy.
• Coordinate with key stakeholders to establish clear goals with measurable objectives.
• Establish an execution plan.
• Phase III – Rollout and Execution
Work Session