

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

Staff
Stephanie Steffens, Director
 Emily Lesh, Assistant Director
 Rebecca Waldo, Project Manager
 Amy Hodson, Project Coord. & Member Liaison
 Leon Duran, Administrative Assistant

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



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!!***

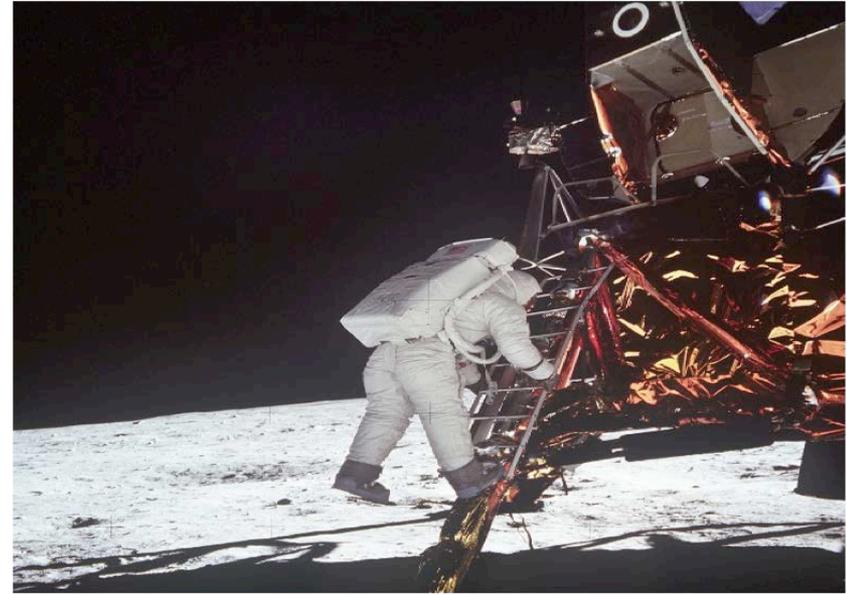
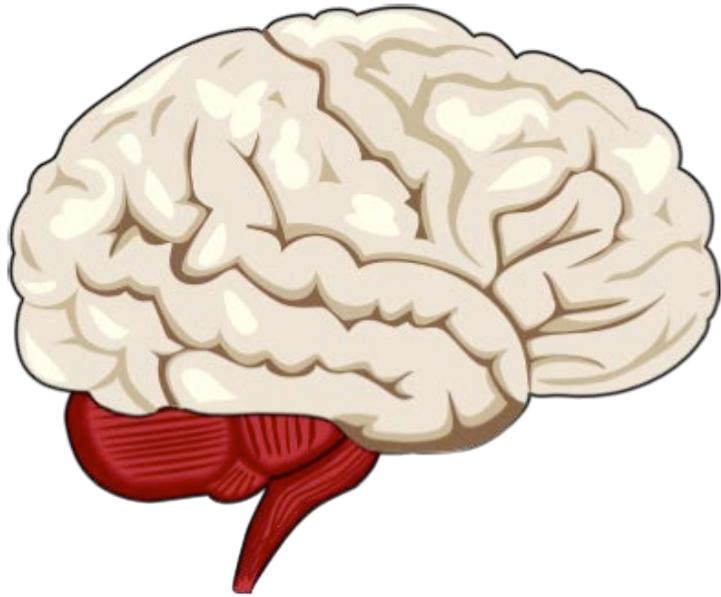
2011
intel
SCHOOL OF
DISTINCTION

Elite
SMART
Showcase School

PRESTON
SCIENCE, TECHNOLOGY, ENGINEERING & MATH

What is the Mission:

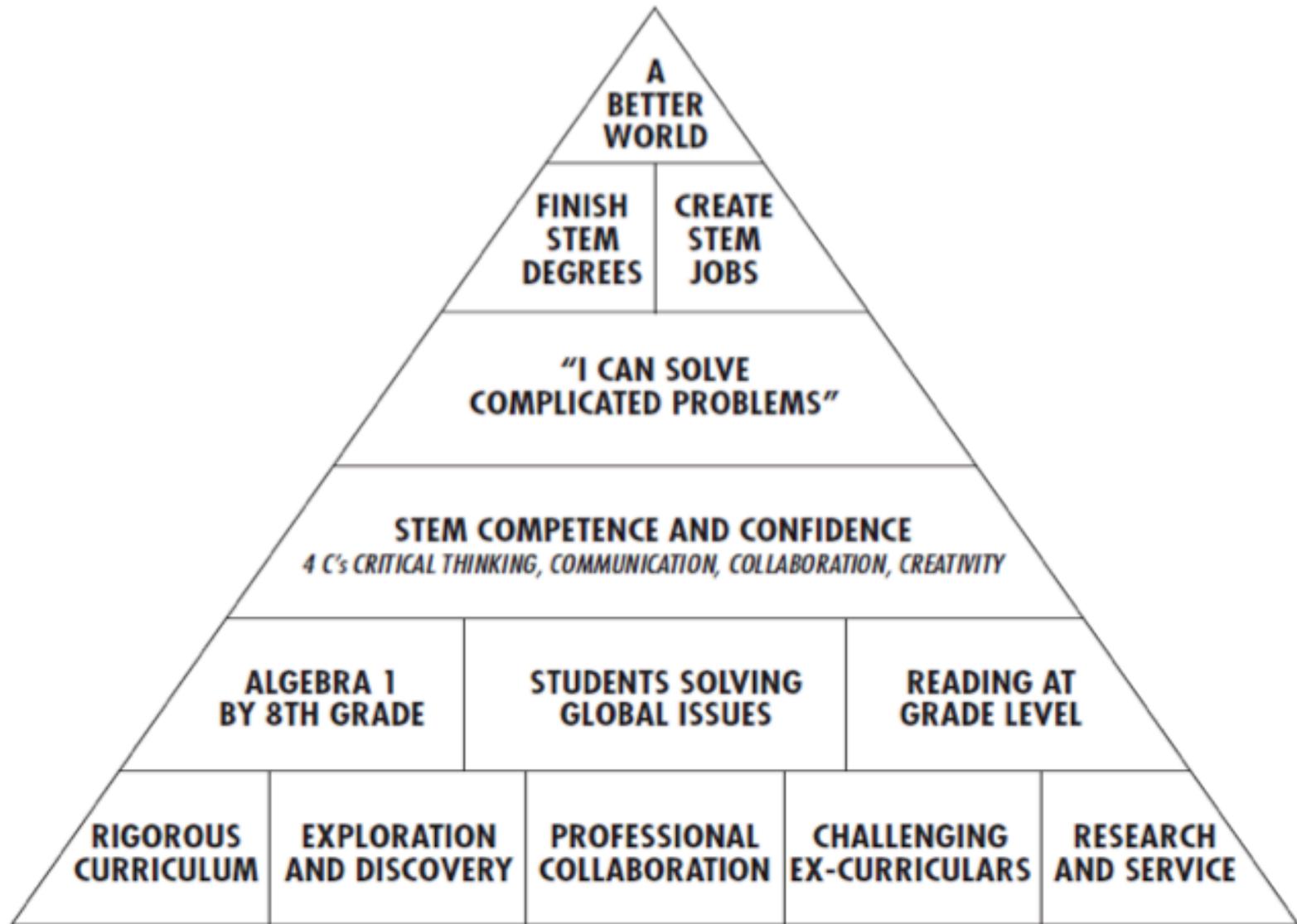
INSPIRE



ENGAGE





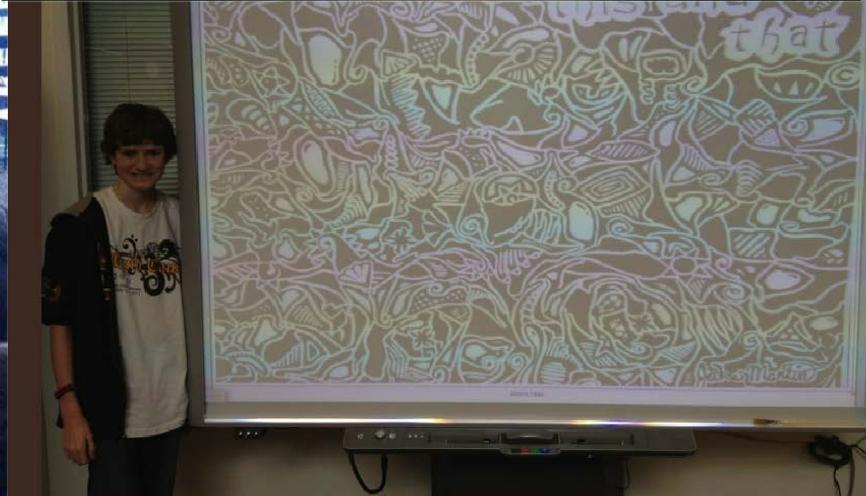


STEM Touches

STEM TOUCHES 06-13	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
SeaPerch: Underwater Robotics								5
Team America Rocketry							16	20
Intro to Chemistry						25	30	30
G-STEM						50	80	100
Astronomy						20	30	30
First Tech Challenge						10	10	15
Eco/Zoo/Oceanography					40	40	80	100
Intro to Biotechnology					44	60	60	60
Visiting Scientist Lunches					75	150	150	200
Video Conferencing				250	550	600	600	600
Robotics Semester class				45	45	45	30	45
Robotics Quarter Class				85	100	100	100	100
Science Olympiad			30	30	45	60	75	60
Flight Simulator			30	35	85	100	100	100
STEM Summer Institute			76	152	407	485	550	650
Science Fair/Grand Challenge			100	180	200	225	1000	1040
First Lego League		10	20	40	45	60	60	60
MathCounts	25	25	25	25	30	30	30	30
Growth Totals	25	35	281	856	1766	2085	3026	3245



21st Century Media Center





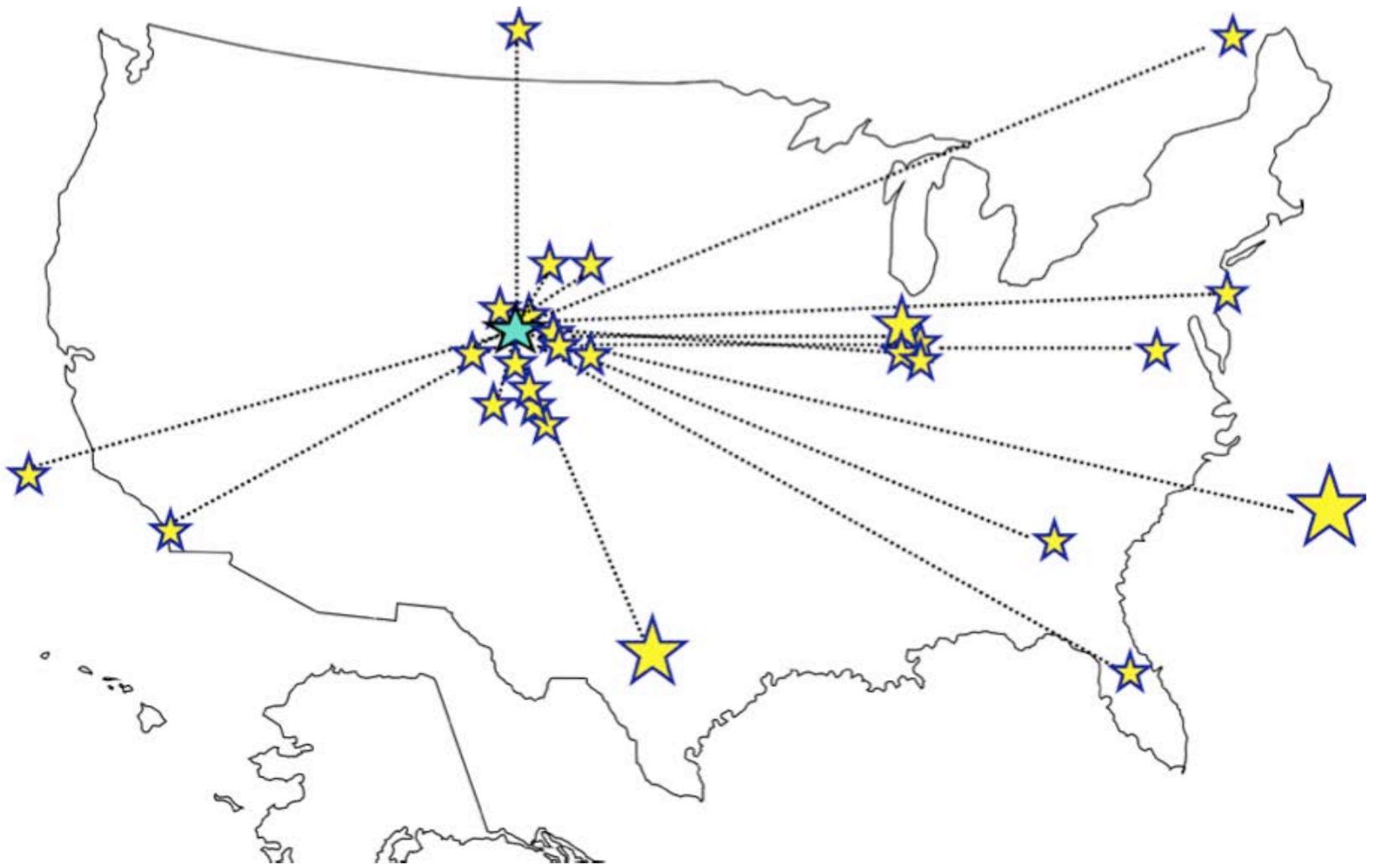


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Become an agent of change

Discover untapped resources

Engage and inspire students

Spoil educators





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

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"



Preston Middle School



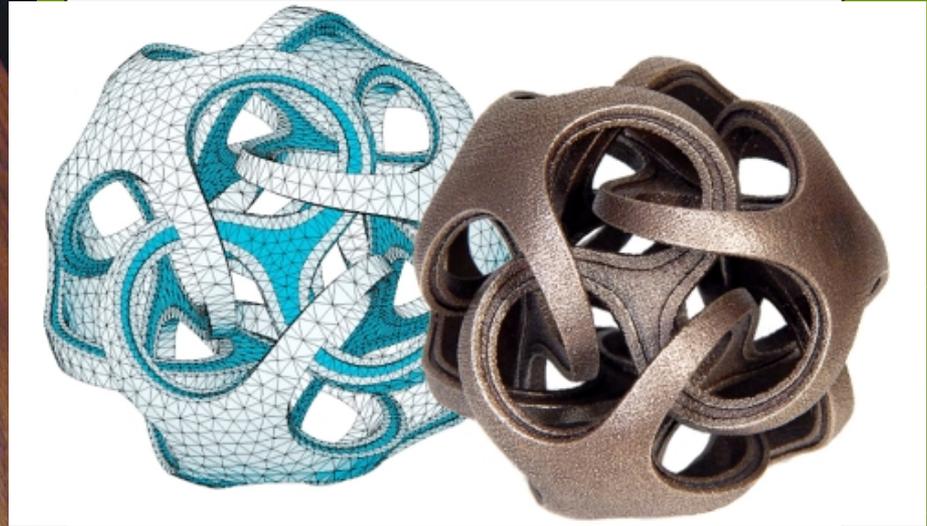
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Speeding Innovation, Creativity & Product Development



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





Housing Development

3D Printing in...

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



Apparel



Interior Design



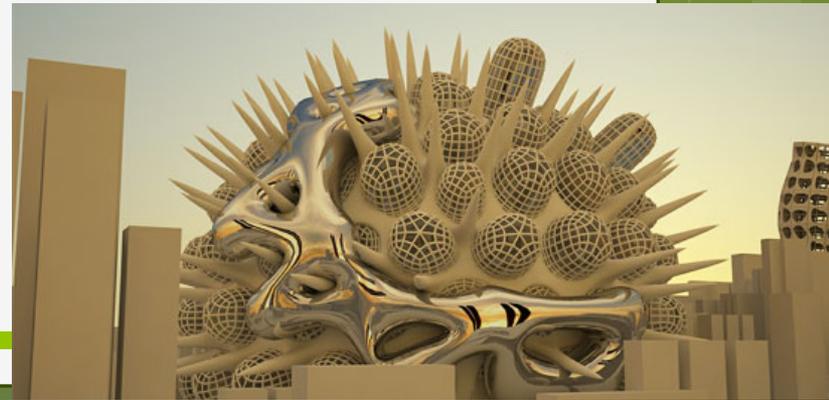
3D Printed Walls & Buildings



PocketInc

Sculpture

3D Printing in Art



The Economist

Europe loses the mobile-phone war
Africa's new wealth
Japan's tea party
How to switch off the internet
The shoe-thrower's index

FEBRUARY 12TH - 18TH 2011

Economist.com

Print me a Stradivarius

The manufacturing technology that will change the world

This violin was made using an EOS laser-sintering 3D printer (and it plays beautifully)



[Watch](#) person playing 3D printed violin

FEBRUARY 12TH - 18TH 2011

Worldwide co

3D Printing in Music



Trumpet



Fully-functional
Guitar



[Watch](#) person playing 3D printed flute



3D Printing in...

For example,

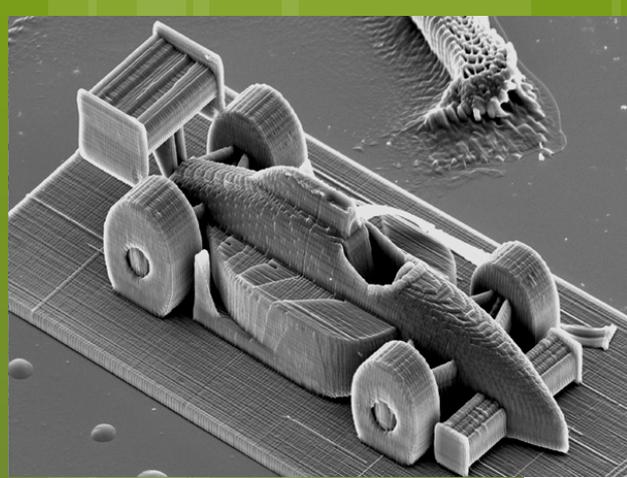
- History
- Communication
- Anthropology

Ancient statue

12th century Egyptian replica

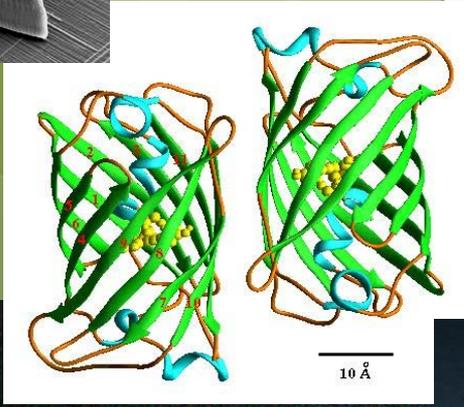


Chinese artifact



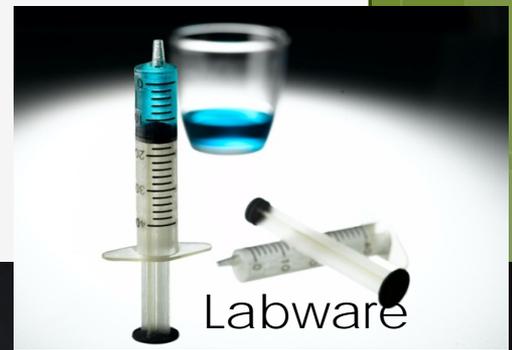
Nano-devices

Molecules

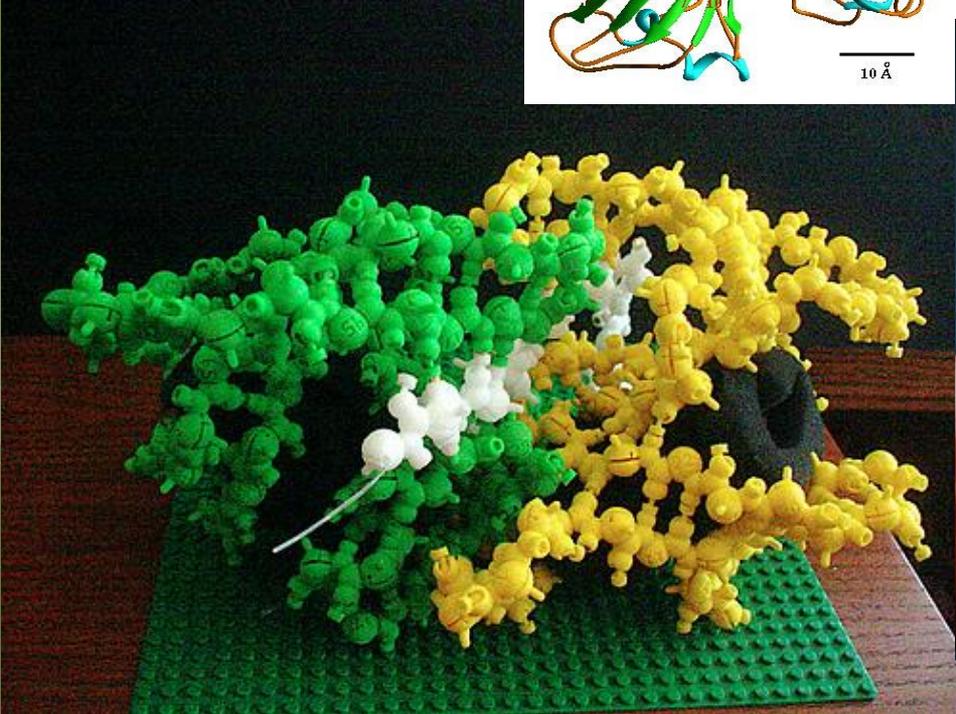


3D Printing in...

- Computing
- Biochemistry
- Biology
- Chemistry
- Physics



Labware





3D Printing in Business

- Entrepreneurship
- Marketing
- Finance & Real Estate
- Innovation

Real Estate



New product prototyping

Real Estate Planning



Marketing



3D Printing in Natural Resources

- Ecosystem Sciences
- Conservation
- Forest and Rangeland
- Geosciences



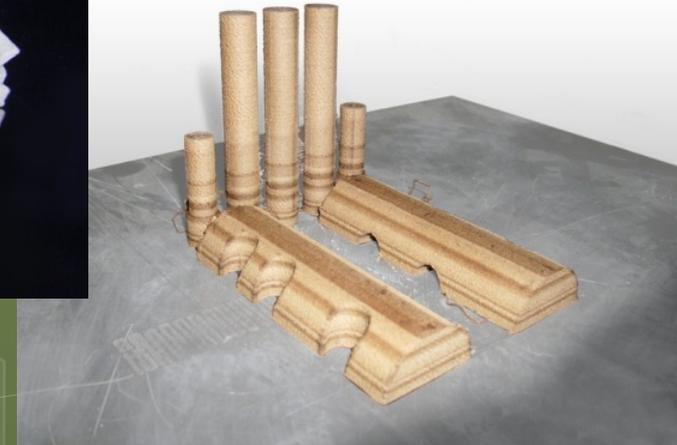
3D printed river basin



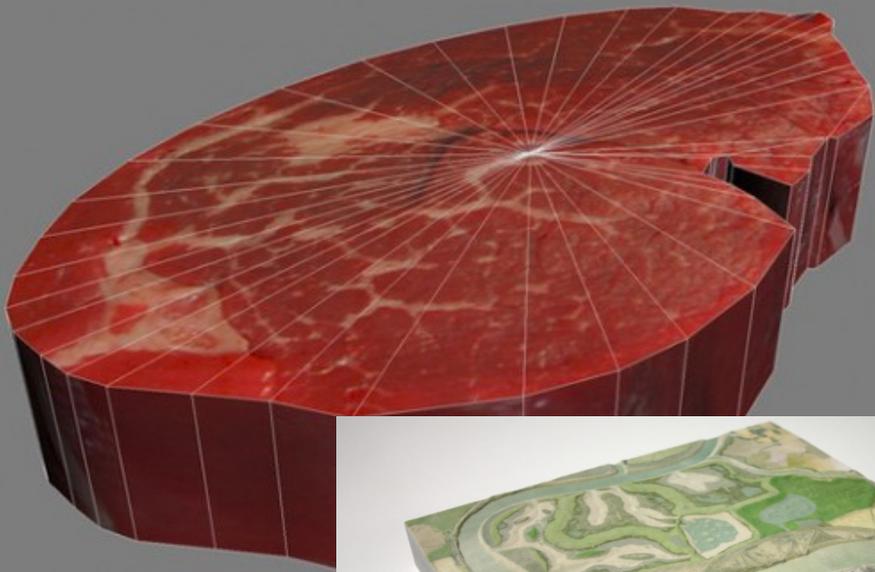
3D printed terrain model



Crystals



Wood with tree rings



3D printed meat

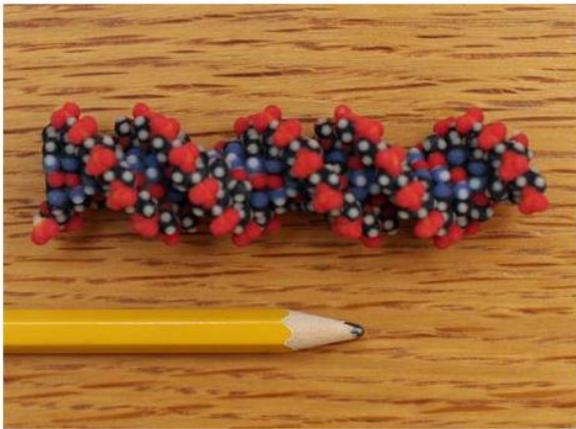


Landscapes

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

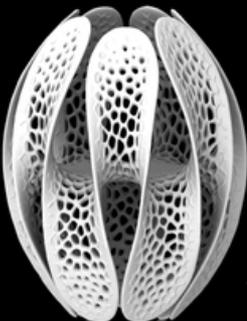
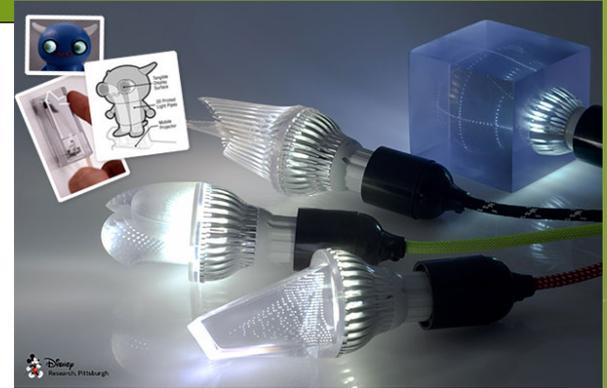


Tree models



What is the I2P Lab?

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

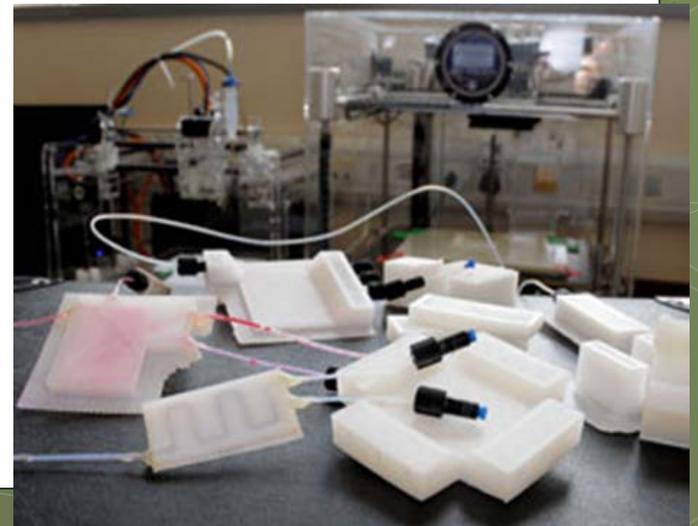


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Watch [video](#) on how 3D Printing works

Mission

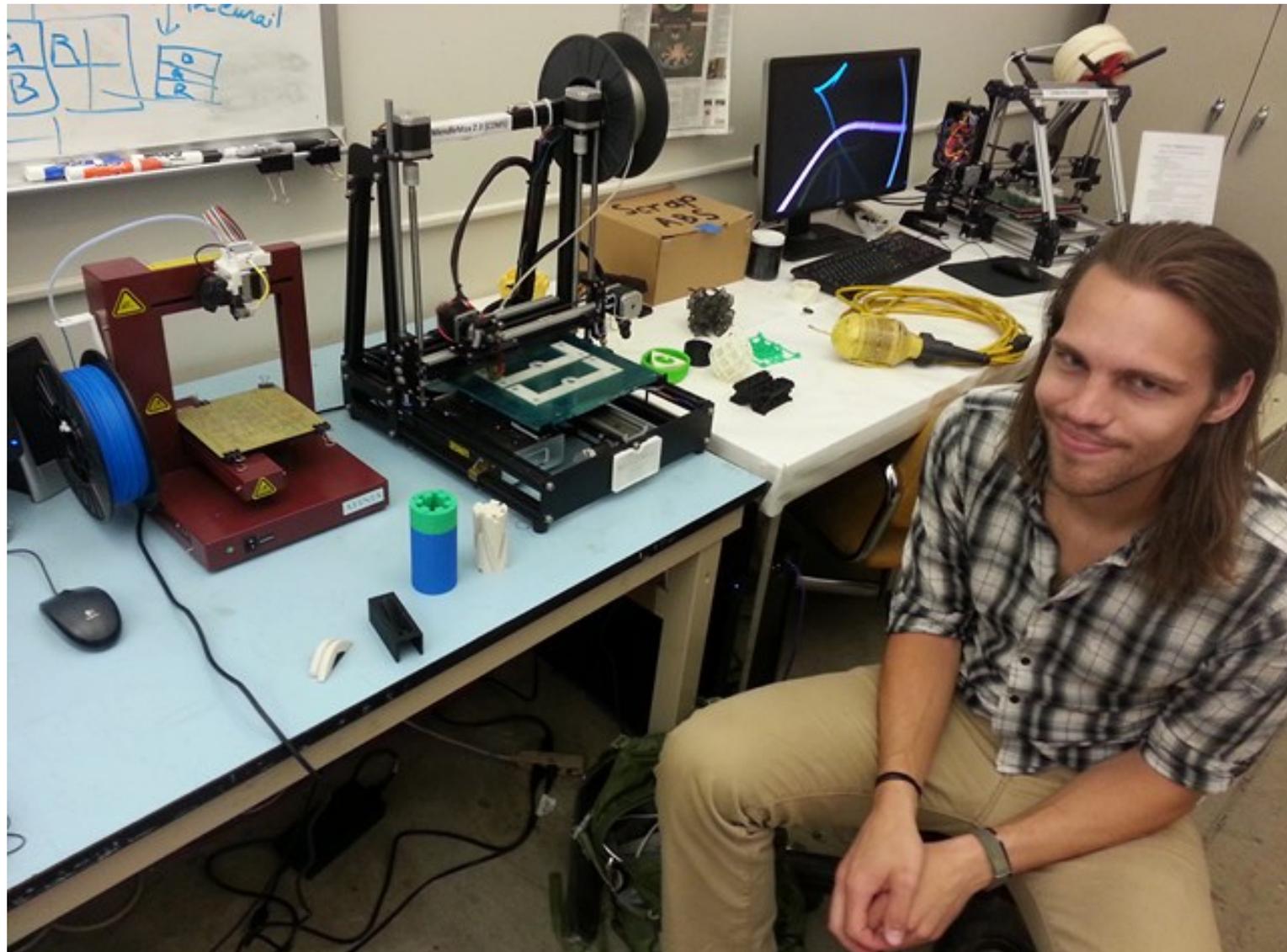
- Enable Innovation
- Accelerate Economic Development
- Enhance Education (industrial, workforce, academic, STEM)
- Expand R&D for local companies



12 Ways We're Empowering...







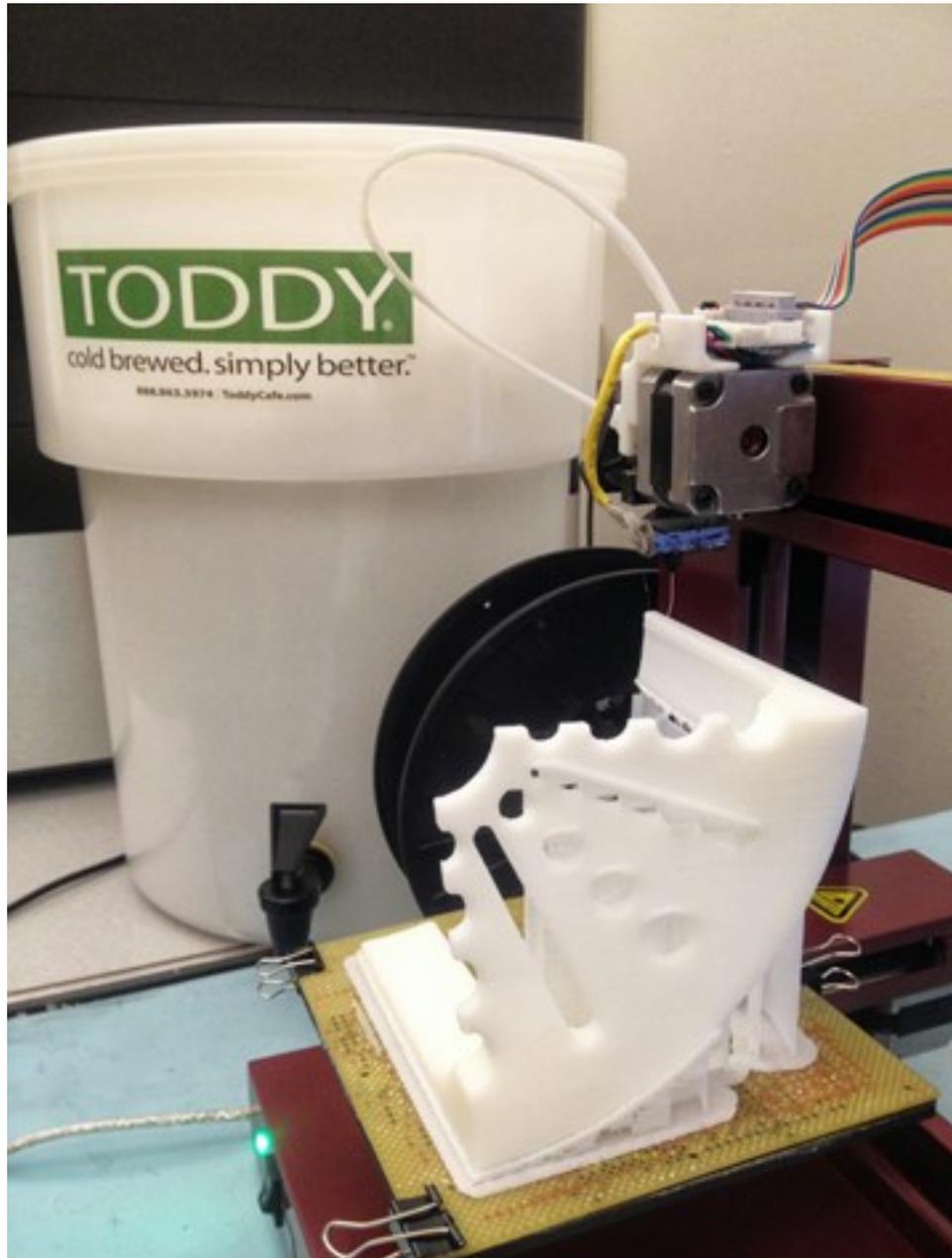


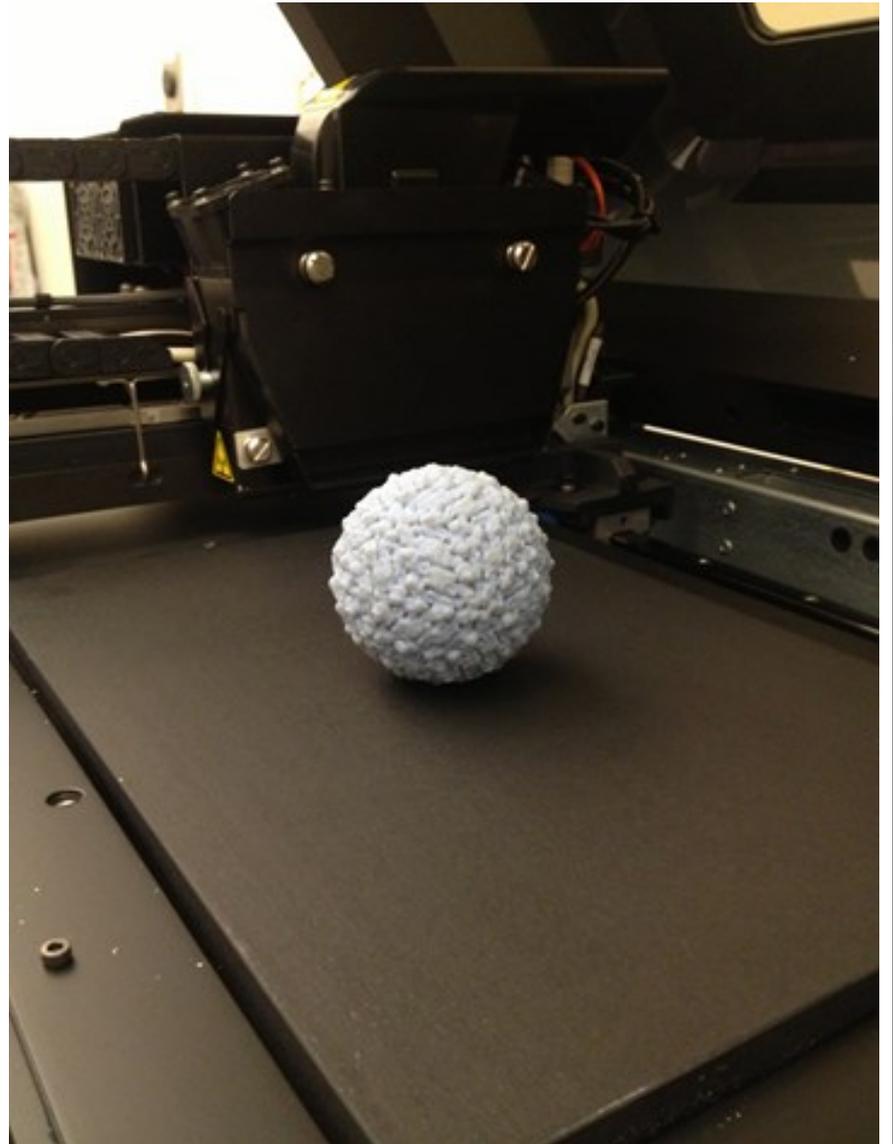
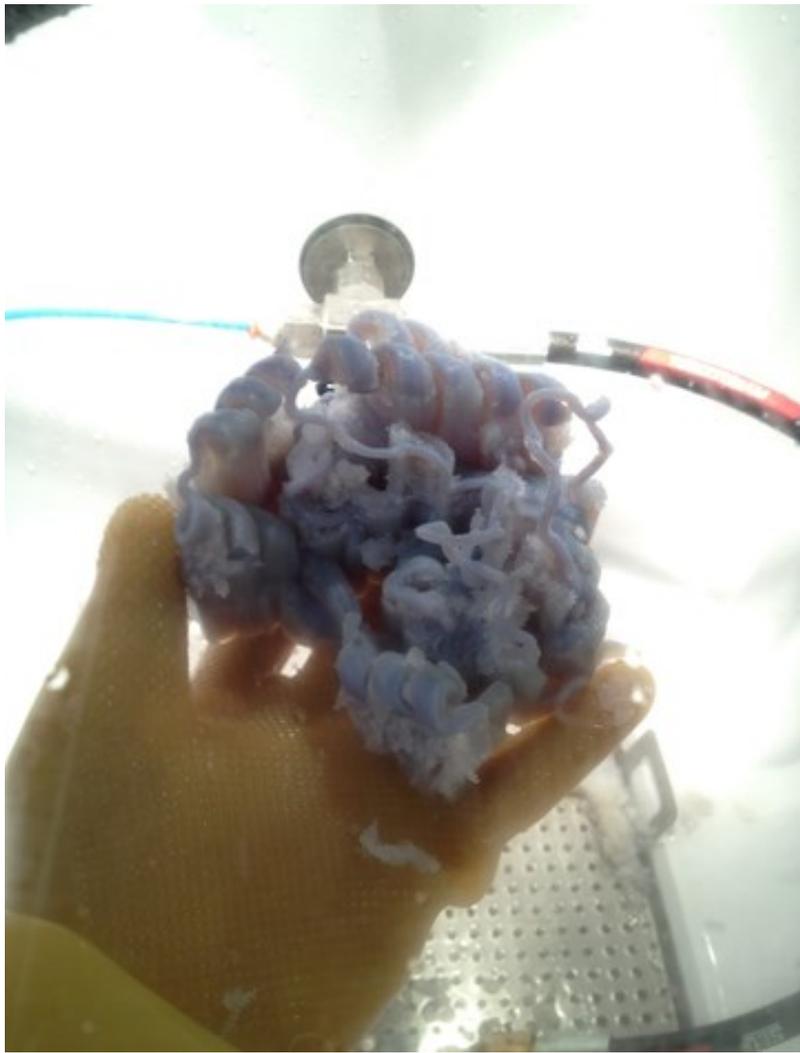












I2P Lab – Current Status

- 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



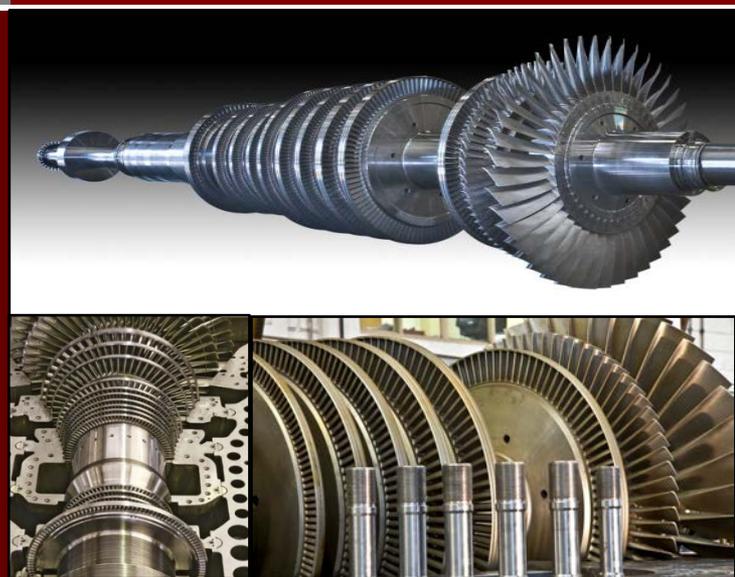
World's first 3D printed airplane

Enhancing Innovation, Education and Economic Development



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

Woodward New Facility & STEM



BJ Lopez

October 2013

Industrial Turbomachinery Systems

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.

PURPOSE

VISION

STRATEGY

LEADERSHIP

Needing to learn - Wanting to teach – Courage to lead

Who is Woodward?

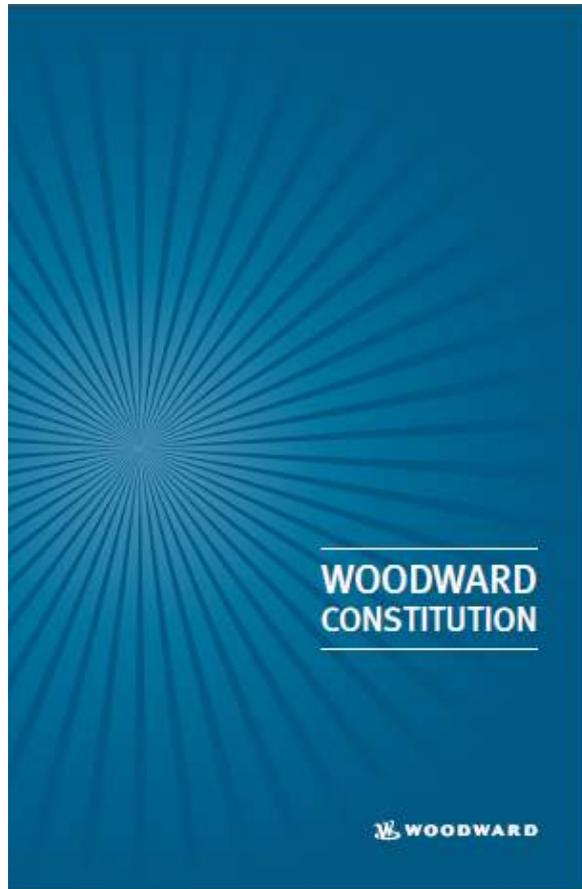
- **Woodward**

- 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.

Values - The Woodward Constitution

HOW WE CONDUCT BUSINESS

BUSINESS PHILOSOPHY:

We believe in
balance among our
stakeholders, and
are driven by ethical
behavior and a core
belief in integrity.

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

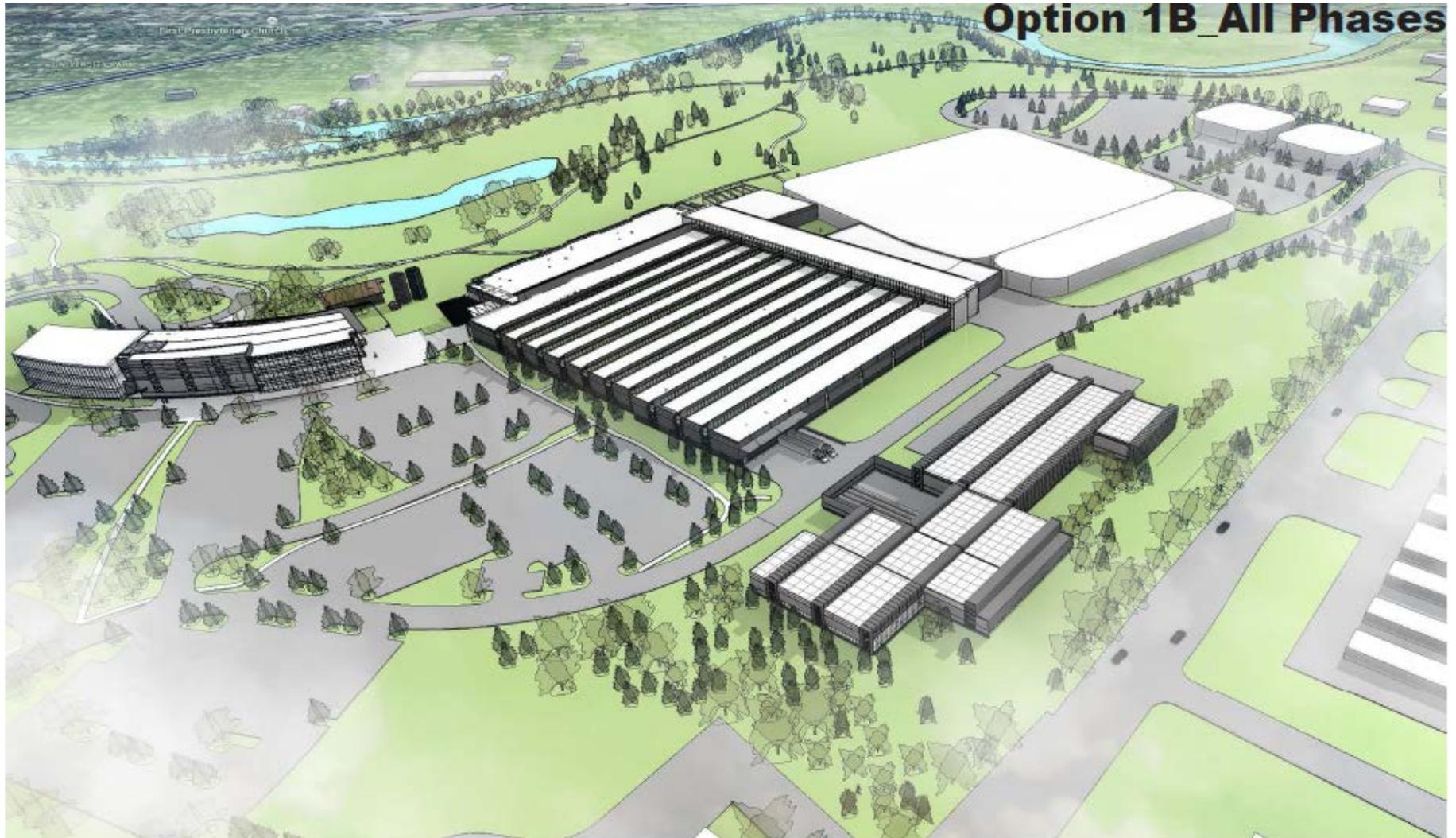
Ultimate Goals of the WTC ITS Campus

- **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 tomorrows 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**

Full Woodward Lincoln Campus Build-out



Exterior Design Details



Workplace Concepts



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

Four work modes:

- Focus
- Collaborate
- Learn
- Socialize



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**

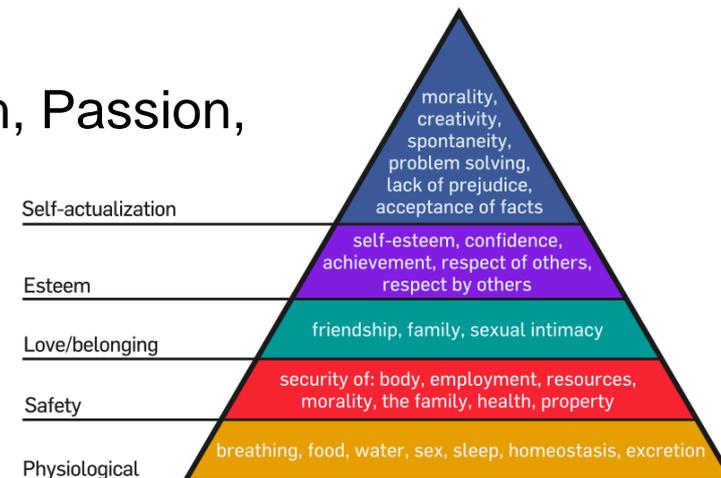
How STEM + 21st Century Skills Relates to Industry

• 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

INSIGHT
KNOWLEDGE
CREATIVITY
CHANGE
LEADERSHIP

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.

COLLABORATION
 COMMUNICATION
 CULTURE

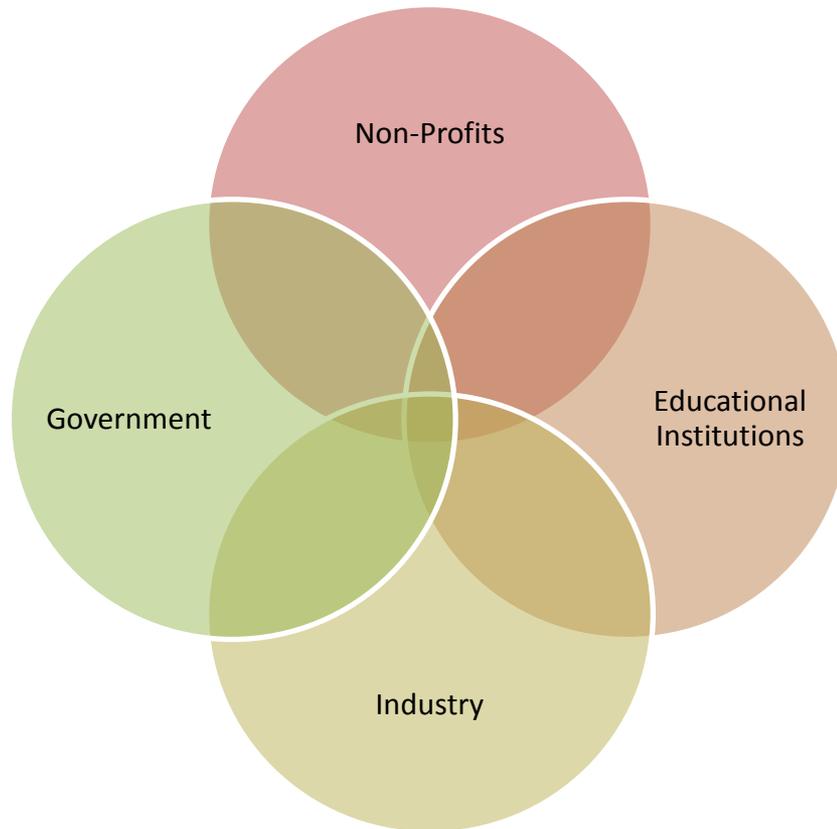


Fail Fast – Fail Often – Fail Forward – Fail Cheap



Identification of STEM Investors

- Four primary STEM partners are identified:



Identify the Strengths that each investment partner brings to the table.

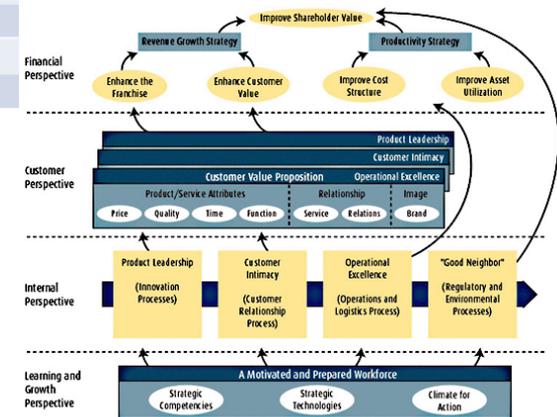
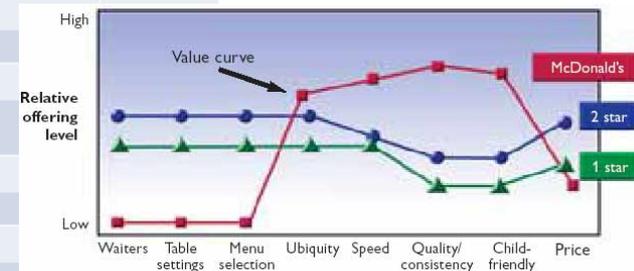
Derive Areas of Strategic Focus

- Utilize strategic investment tools to guide decisions

STEM & Education Trend Categories	Areas of Strategic Focus						
	Core Educational Curriculum	Business Investment	Institutionalization	Governmental Investment	Divestiture	Collaboration	Disruptive Change
Behavioral & Social Sciences							
Learning Styles							
Socio-Economic Factors							
Race and Gender Differences							
Curriculum Structure							
Teacher Talent Pool							
Regulatory Change							
Emerging Technologies							
Emerging Fields of Study							
Emerging Business Needs							
Political Landscape							
Public Awareness							

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.



© 2002 Balanced Scorecard Collaborative Inc.

Identify the Value Chain

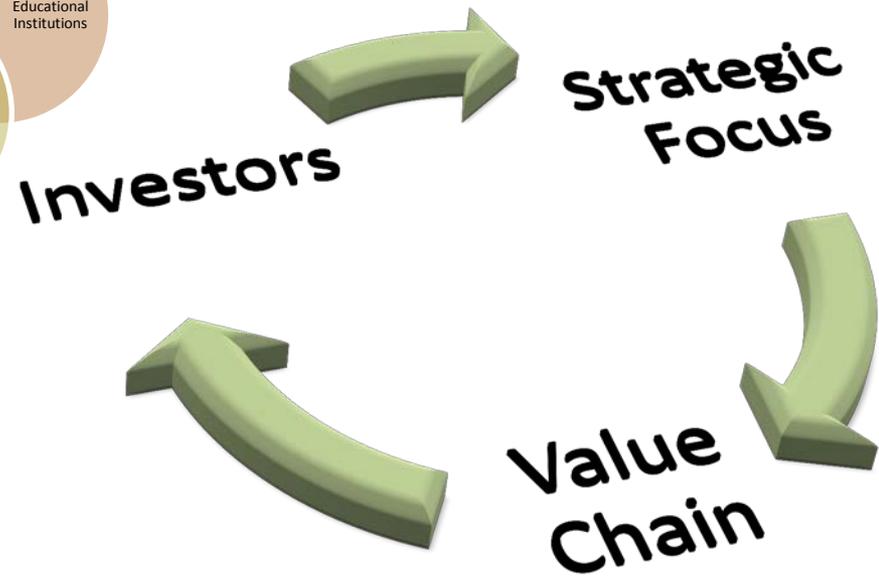
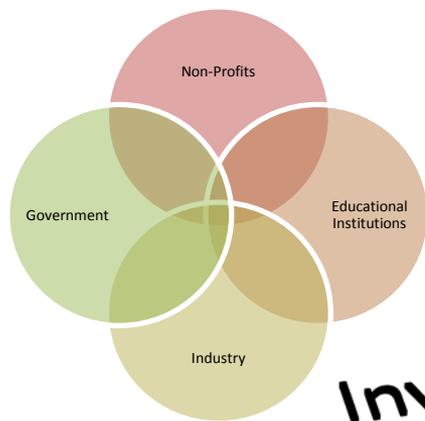
- **Who is a STEM Customer and why is STEM valuable to them?**

Develop who lies within the STEM value chain.

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



Bring the Plan to Life



Put it all together and test the hypothesis.

Question the validity of our assumptions and vet out risks.



Phase II

- **Generate a sustainable business plan to support the strategy.**
- **Coordinate with key stakeholders to establish clear goals with measureable objectives.**
- **Establish an execution plan.**
- **Phase III – Rollout and Execution**



Work Session

