LEMELSON-MIT

Celebrating invention, inspiring youth

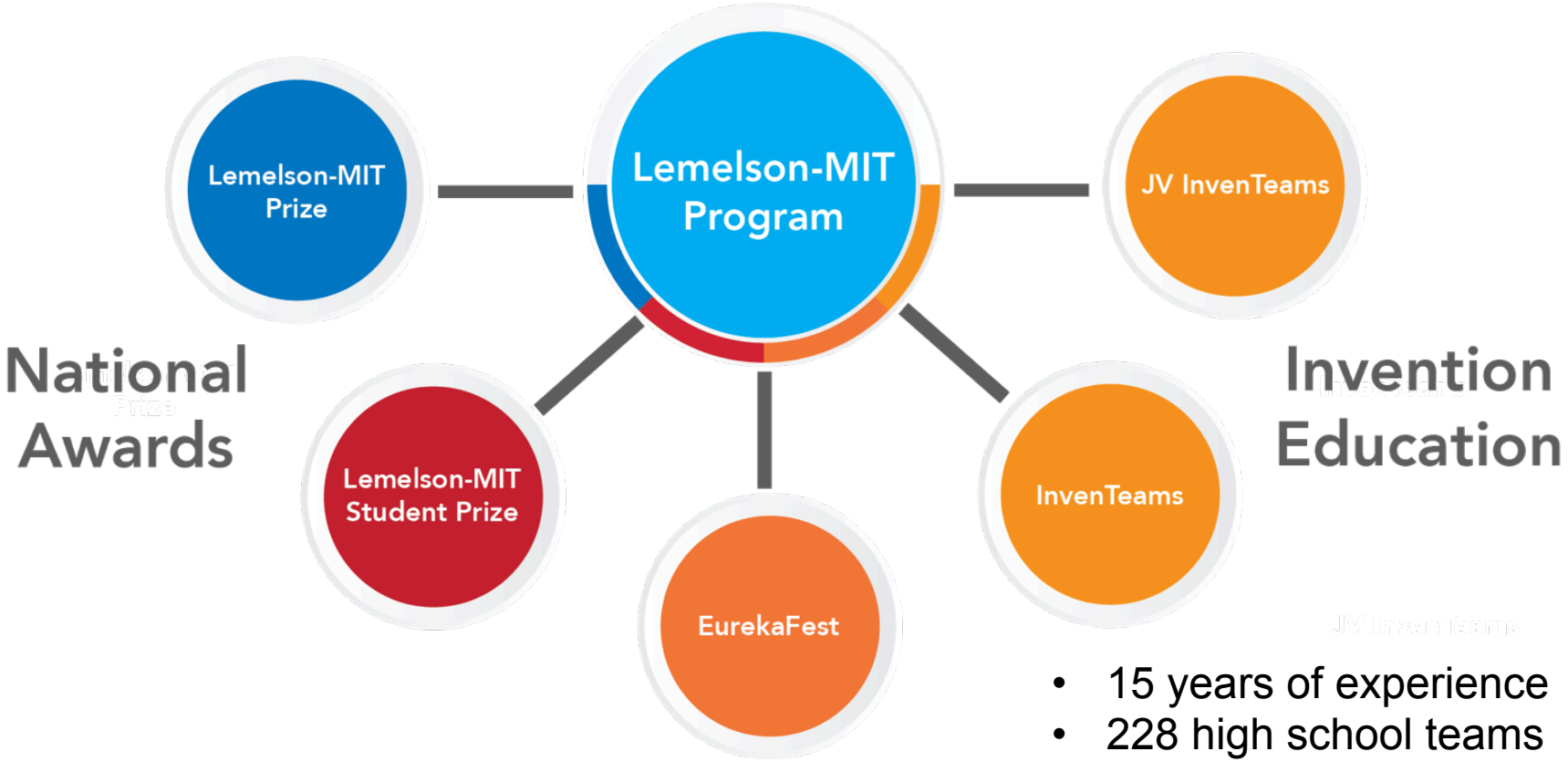
Project-based Learning Framework and Projects

Invention Education
Webinar Series

Thursday, November 16, 2017

6:30 – 7:00 p.m. ET

Lemelson-MIT Program Overview



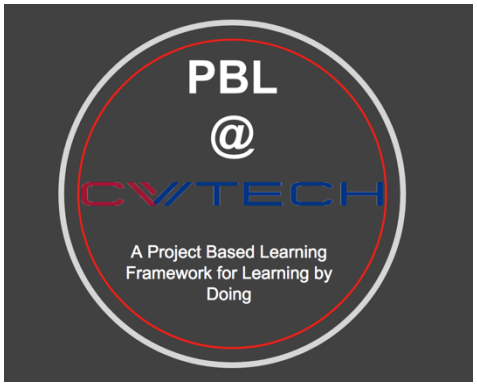
- 15 years of experience
- 228 high school teams
- 7 U.S. patents

LEMELSON-MIT
Celebrating invention, inspiring youth

Presenters Don Wilson and Scott Charlson

Don: Coordinator of Educational Technology

Scott: Project Based Learning Coordinator



Invention Education Experience

- Canadian Valley Tech Center (Oklahoma)
- ULearn Academy Partnership with sending schools
- MakerSpace Planning & Deployment
- Coordination with Tech Center Programs
- Adult & Continuing Education Classes

Presenter Mike Gallagher

- Technology Education department chairperson at Saratoga Springs High School, NY
- Master teacher PLTW
- Leader Educating Young Engineers program

Lemelson-MIT InvenTeam Experience

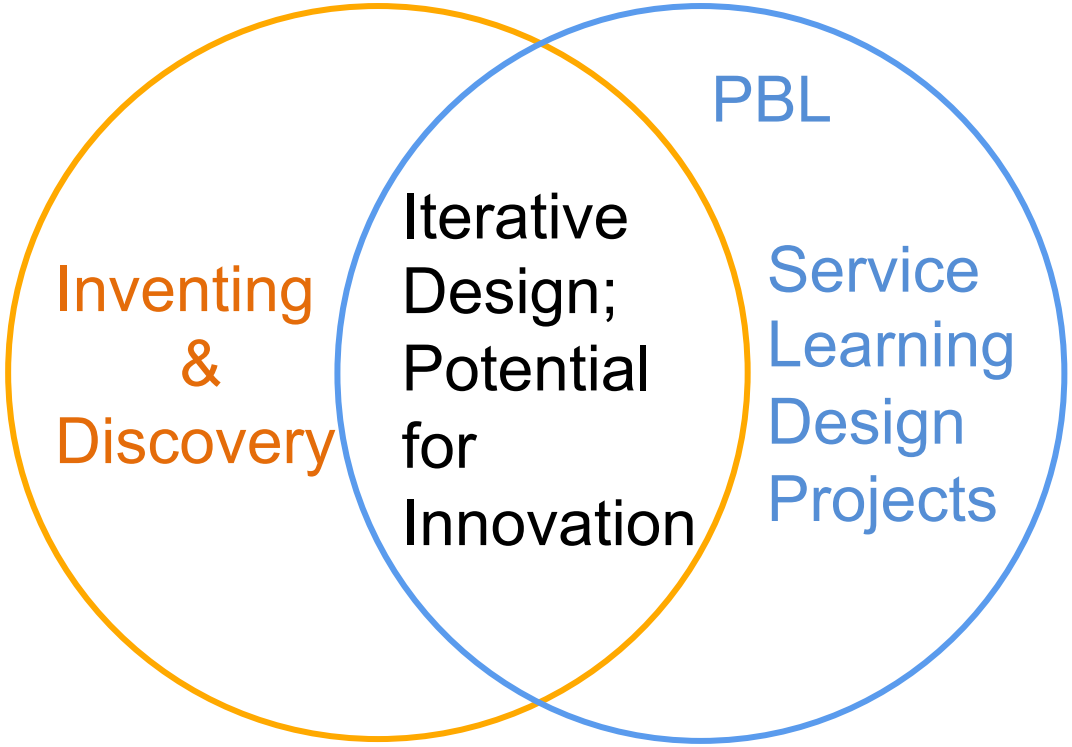
Saratoga High School InvenTeam 2008: the Garden Consultant

LEMELSON-MIT
Celebrating invention, inspiring youth

Invention and Project-Based Learning

Technological inventions are:

- Useful (User-centric)
- Unique
- Reduced to practice (they work!)



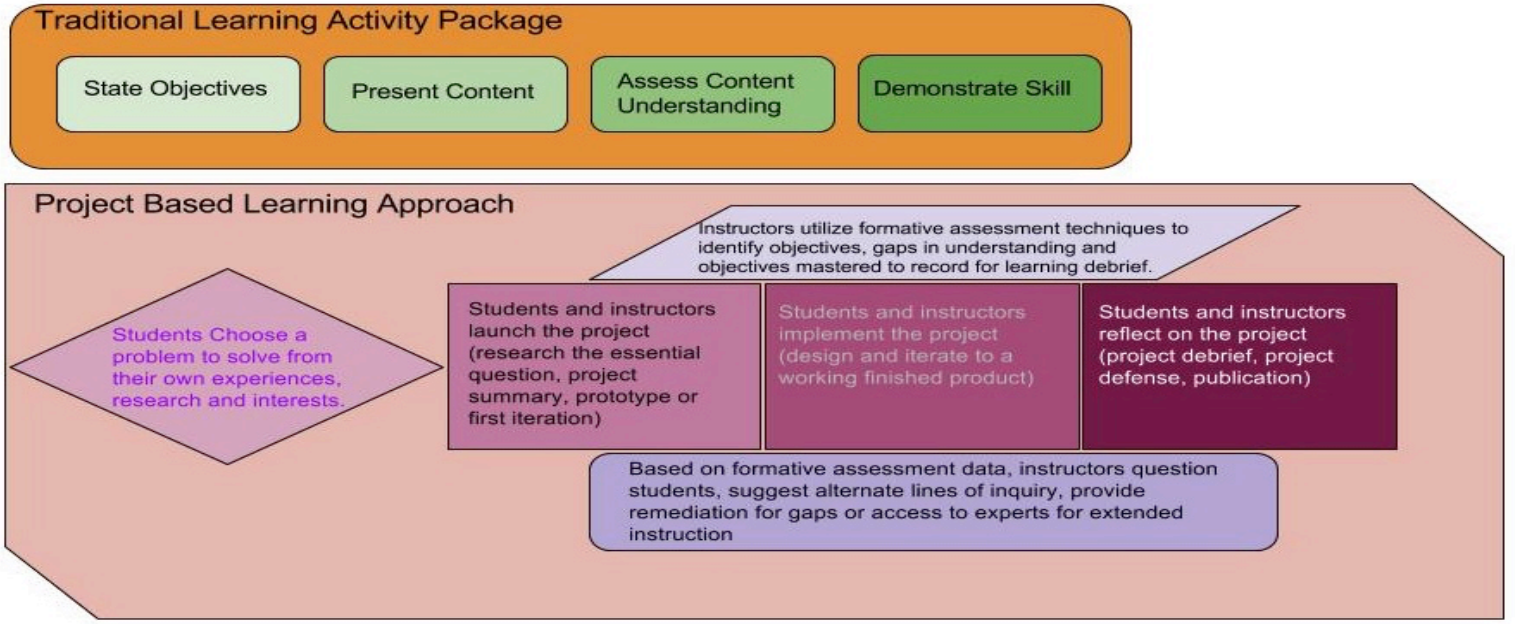
LEMELSON-MIT
Celebrating invention, inspiring youth

Project-Based Learning Experiences at CVTech

Project Based Learning is Historically Central to the Career Tech Approach:

Most courses have projects embedded since the 1970s

Makerspace has “innovated” the system



LEMELSON-MIT
Celebrating invention, inspiring youth

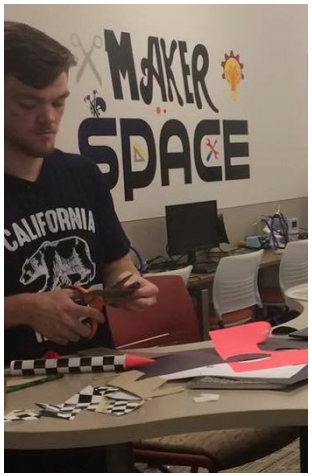
Framework of PBL at CVTech

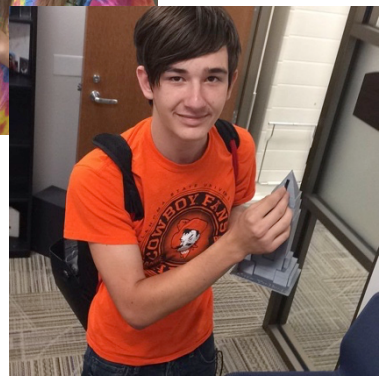
Three phases to any project.

Phase 1 Launch/Research/Design

Phase 2 Implementation

Phase 3 Reflection





LEMELSON-MIT
Celebrating invention, inspiring youth

Early Care Education Memorial Project

The Helping Tree

Project Launch- The task: finding a replacement for a planned bookshelf and memorial to sit in the entry of the daycare.

Early Care Education Memorial Project

Project Implementation- design and build the bookshelf with the help of Construction Trades and Auto Collision Repair classes.

LEMELSON-MIT
Celebrating invention, inspiring youth

Early Care Education Memorial Project

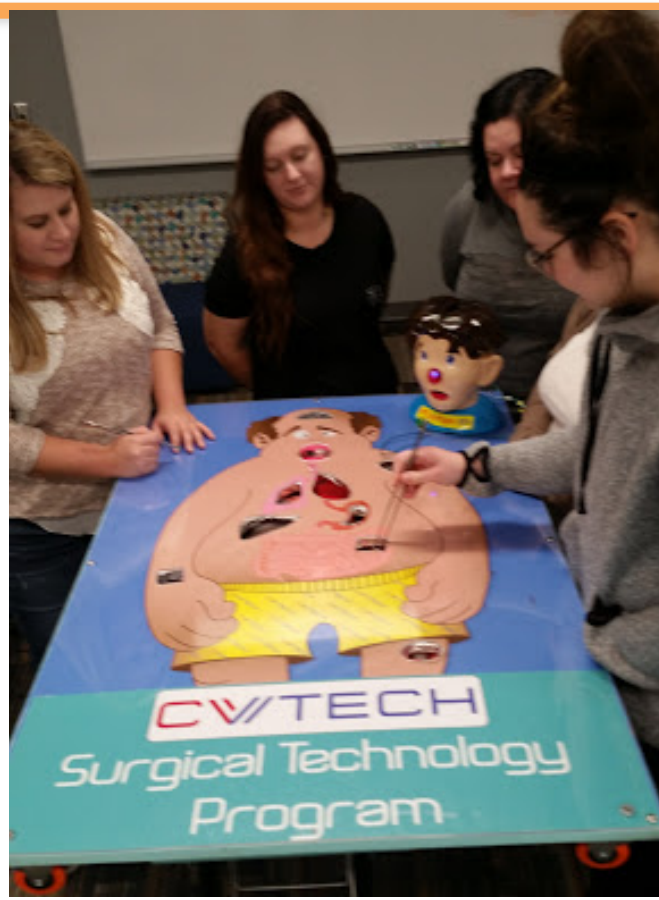
Project Reflection- Wrote and illustrated a children's book as the project reflection which included feedback from most of the project participants.

LEMELSON-MIT
Celebrating invention, inspiring youth

Surgical Tech Life-Sized Operation Game

Project Launch:
The task: developing a fun and engaging recruiting tool for the program

Project Implementation:
Cross-program collaboration with Service Careers class for wood construction, and MakerSpace for the making of the internal organs (3D printing)



Project Reflection:
Surgical Technology students engaged 8th and 10th graders with this tool at school visits and on campus tours.

LEMELSON-MIT
Celebrating invention, inspiring youth

Educating Young Engineers program (EYE)

High school students help facilitate engineering programs **outside of the school day** for younger students.

Elementary students held up their Lego® Cars

Elementary students observed as their mock hot air balloon took flight

Elementary students held up the "Brush Bots" they made out of tooth brushes and battery-operated motors

Funding Engineering and Inventing

High school students generate funds and excitement for the creation of engineering programs **during the school day.**

High School students worked with local PTO members to plan for EYE

High students worked on PLTW projects

LEMELSON-MIT
Celebrating invention, inspiring youth

To implement PBL…

- Team-based approach with the learner at the center supported by a learning coach
- Iterative design process
- Socratic questioning throughout along with ongoing formative assessment followed by action
- Summative assessment in concert with the learner in a project defense

Lemelson-MIT Resources

- Lemelson-MIT Program
http://lemelson.mit.edu/

- InvenTeams National Grants Initiative
http://lemelson.mit.edu/inventeams

- JV InvenTeams Curriculum Materials
http://lemelson.mit.edu/jv-inventeams

- Inventor Archive
http://lemelson.mit.edu/search-inventors

LEMELSON-MIT
Celebrating invention, inspiring youth

Other Resources

•The Buck Institute

http://www.bie.org/about

For general information and training on project-based learning. We hear from invention education teachers that they have or are interested in attending PD at the Buck Institute to learn more about PBL.

•EPICS program at Purdue University

https://engineering.purdue.edu/EPICS/k12

Integration of service learning and engineering through projects. Several invention educators utilize EPICS in their classrooms as preparation for InvenTeam projects or as smaller projects following InvenTeam projects.

Other Resources

- Saratoga Springs EYE Program
  Overview of the EYE program Video

- CVTech Framework Google Doc
  Oklahoma Horizons Video News Magazine Stories (Video One, Video Two)
  Oklahoma State Department of Career Tech Focus Video
  Follow @cvtechmakers on Twitter
  Follow cvtechmakers on Instagram

LEMELSON-MIT

Celebrating invention, inspiring youth

THANK YOU!

Contact Us at PD-lemelson@mit.edu

Invention Education
Webinar Series

LEMELSON-MIT

Celebrating invention, inspiring youth