

# LEMELSON-MIT

*Celebrating invention, inspiring youth*

## Managing Diverse Teams

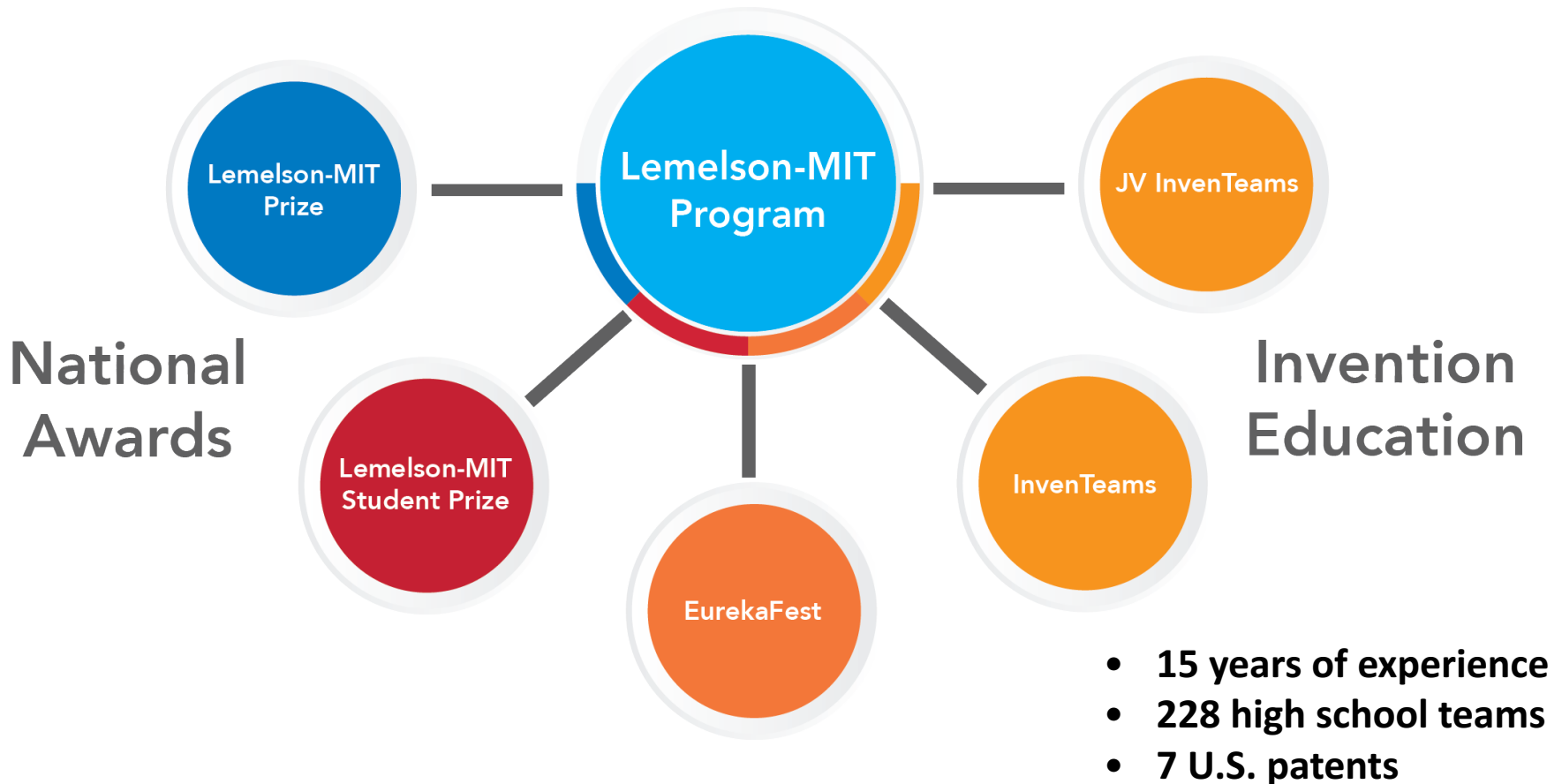
Invention Education  
Webinar Series



Thursday, February 8, 2018

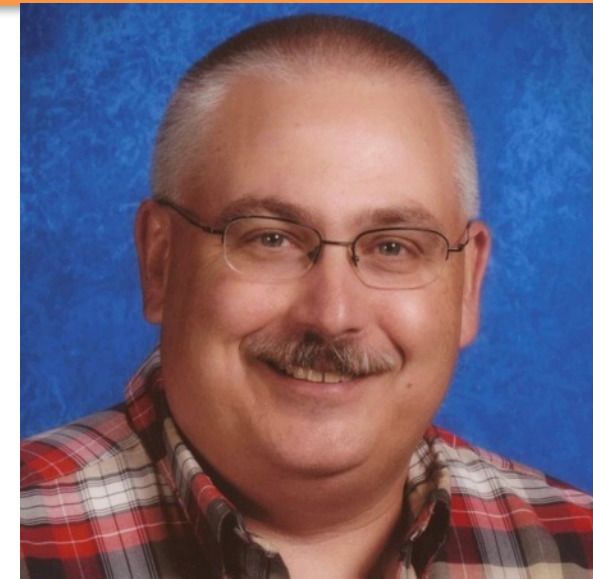
6:30 – 7:00 p.m. ET

# Lemelson-MIT Program Overview



# Presenters: Bob Richards

- Business, Marketing, and Technology Teacher at Stockbridge High School, MI
  - 16 years of teaching experience
  - Robotics instructor of Stockbridge Advanced Underwater Robotics Team
  - President of Stockbridge Education Association
  - 20 years of experience serving in the Army



## Invention Education Experience

- Lemelson-MIT InvenTeam (2016)

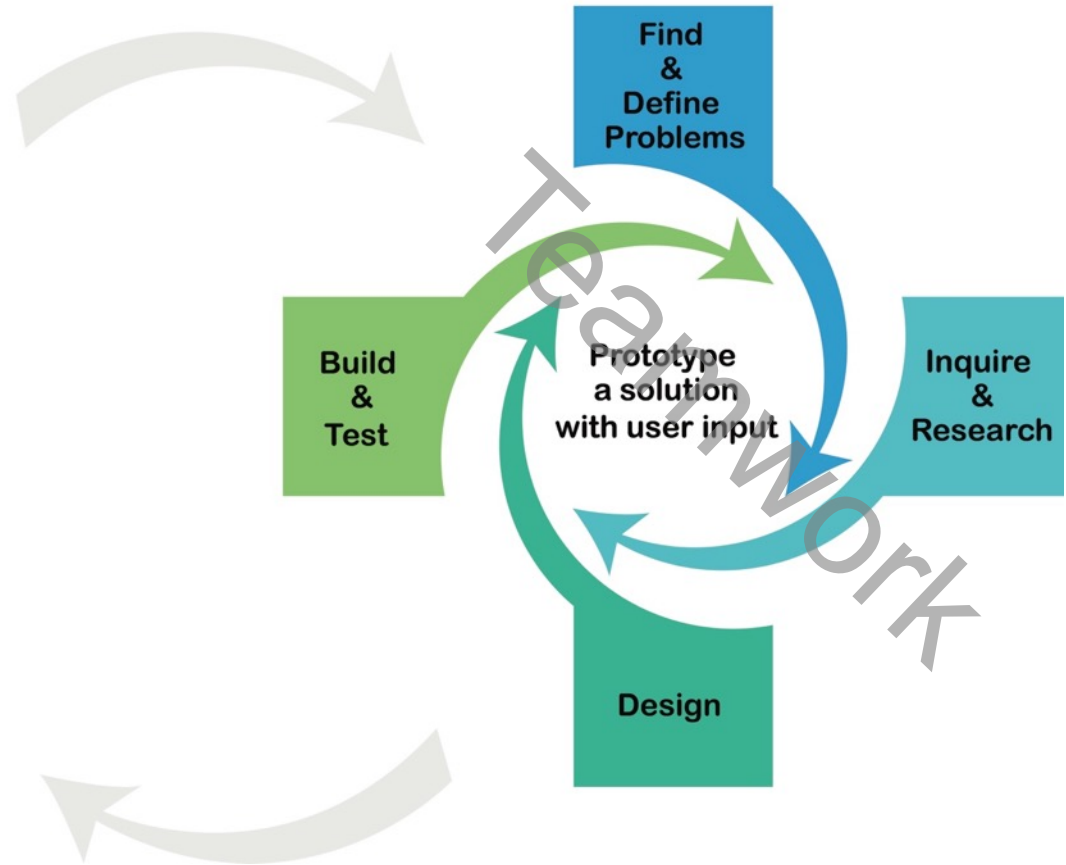
Underwater sensing and reporting system of lamprey larvae in the Great Lakes



# Invention Cycle

**ENTRY POINTS**  
through knowledge,  
skills & interests

- STEM
- STEAM
- Arts
- Humanities
- Robotics
- Coding
- Participatory Youth  
Action Research
- Career & Tech Ed
- Fab Labs
- Maker Spaces
- Entrepreneurship



# Invention Teams

- Inventing and other STEM projects are “team sports.”
- A well-functioning team helps ensure the success of projects.

However, not all teams are well-functioning.

- Problems on teams lead to
  - ✓ Absence of trust
  - ✓ Lack of commitment
  - ✓ Avoidance of accountability
  - ✓ Inattention to results
  - ✓ Conflict
  - ✓ Loss of membership

Remember, inventing is just plain fun!

# Elements of a well-functioning team

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- **Common Goals**
  - align goals within the team and individuals (e.g., agreeing on invention problems and solutions)
- **Defined team roles and responsibilities through team building**
  - understand what is needed to accomplish the invention
  - identify the strengths of each member
  - know the roles and responsibilities of each individual within the team
- **Effective communication**
  - create “footprinting”—building a collection of notebooks, documents, data, videos, pictures, and sound recordings that will serve as a record of your team’s work



# Team Building Activity: Balloon Tower Challenge

Small teams build the tallest, free-standing tower using balloons and some sticky tape within a set time



# Four Corners

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- **Tinkerer**

- I like to take things apart and build things

- **Talker**

- I like to talk to people and I enjoy public speaking

- **Organizer**

- I like to organize people and things

- **Doodler**

- I like to draw things and express my thoughts through drawing



# Building the Stockbridge InvenTeam

- Recruit team members who are used to working together (attending the same class or activities, etc.)
- Allow flexibility for students with diverse expertise to participate
  - Students can participate as a club or an elective class
- Team building activities
  - SCUBA training
  - Running the class as a team/business



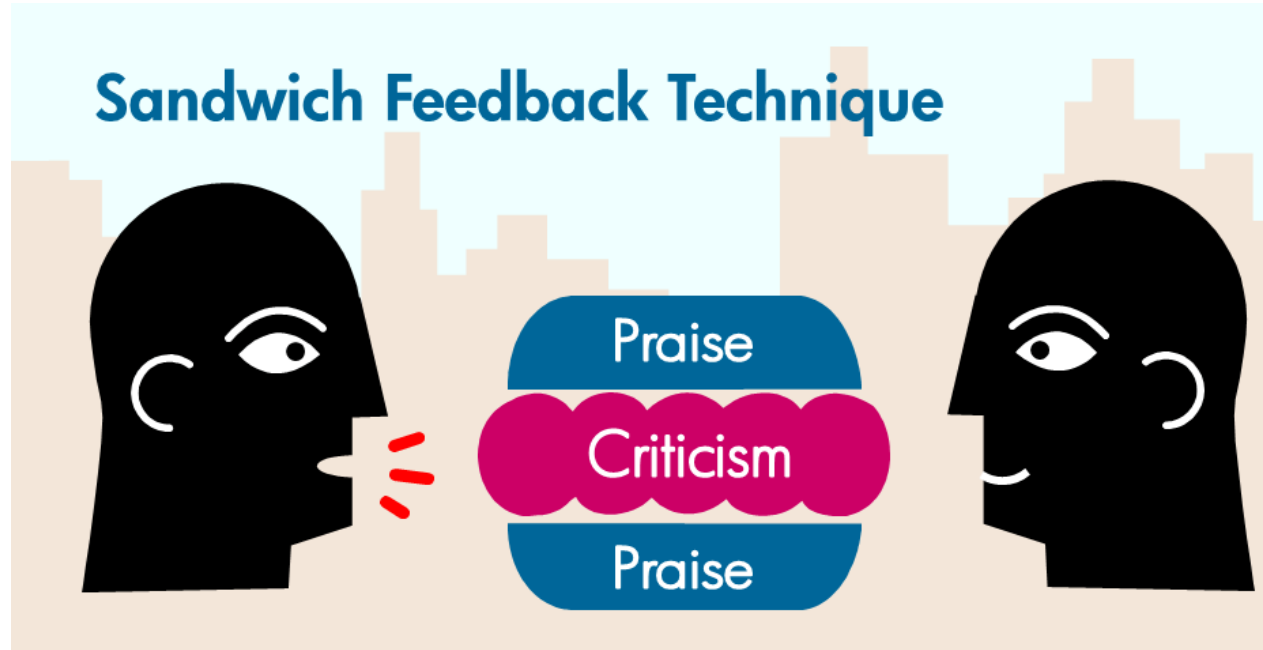
# Managing the Stockbridge InvenTeam

- Specify roles and divide labor. Identify milestones.
- Menlo Board to track multiple projects and sub-tasks. Identify a responsible individual (RI)
- Periodic design reviews (formal and informal, even for smaller subtasks and fundraising)
- Brief and debrief each day
  - Brief: What are we planning to do? Who is responsible? How do we measure success?
  - Debrief: What went well? What do we need to improve upon? What needs to be accomplished before tomorrow (homework)?



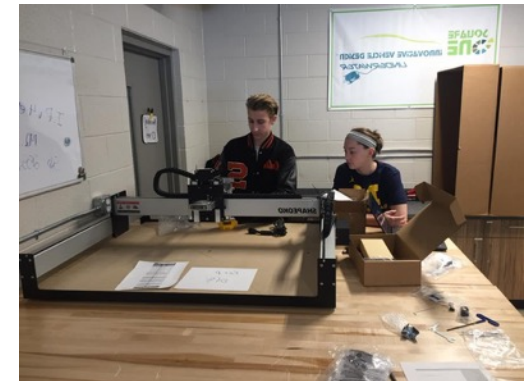
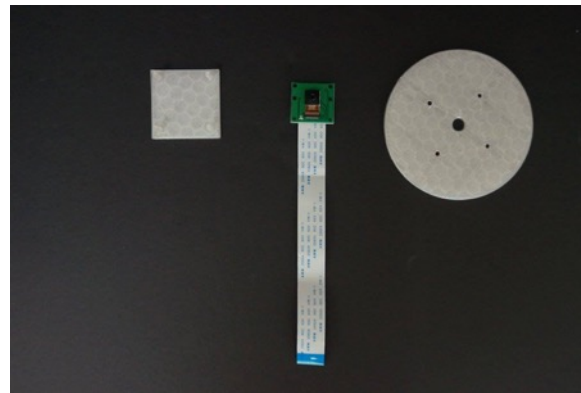
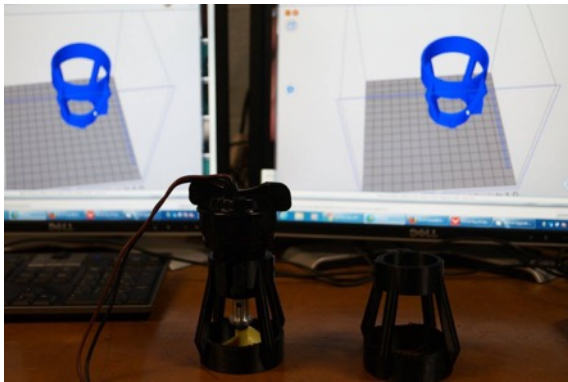
# Managing the Stockbridge InvenTeam

Critique without destroying motivation



# Managing the Stockbridge InvenTeam

- Comparing competing ideas or concepts using
  - Rapid prototyping
  - Cardboard and PVC models
  - 3D Printed Prototypes





# Don't wait for the conflict resolve itself. Be proactive!

Portable Bicycle-powered  
Emergency Water Filtration  
Station at the 3<sup>rd</sup> White  
House Science Fair  
*Northeast High School  
InvenTeam 2012 (Oakland  
Park, FL)*

The student leader called a hiatus to address team strife before moving forward into the last technical push to build. The hiatus included a picnic at a local park!



# Lemelson-MIT Resources

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- 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>



# Other Resources for Developing Teams

- Some STEM programs with PBL are investigating the use of business practices that involve effective teamwork and communication
  - [Six Sigma](#)
  - [Lean Product Development](#)
- [Teaching Teamwork from MIT's Teaching+Learning Lab](#)
- Team Process 2017: Following [Silver video](#) from MIT's 2.009 senior Mech E capstone class – a large, team-based design class; a former Natick High School InvenTeam member was the Silver team's leader
- [Thanks for the Feedback](#) by Douglas Stone & Sheila Heen

# Other Resources

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- [Teamwork during invention \(suggestions from Inventions Unlimited Inc.\)](#)
- [What Google Learned From Its Quest to Build the Perfect Team](#) (an article from the New York Times about building teams)
- Stockbridge InvenTeam on Facebook: <https://www.facebook.com/StockbridgeInvenTeam/>

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**THANK YOU!**

Contact Us at  
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Invention Education  
Webinar Series

