



MINNESOTA STATE
Engineering Center of Excellence

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MINNESOTA STATE

Engineering Center of Excellence

Enhancing Education.

Engaging Industry.

Inspiring Students.

CENTERS OF EXCELLENCE

- Advanced Manufacturing
- Agriculture (x2)
- Energy
- Engineering
- HealthForce
- IT
- Transportation

Bridging gaps.

K-12.

Post-secondary.
Industry.

Enhance MN career pathways.
High-demand, high-pay fields.



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Minnesota State Centers of Excellence: Common Strategic Directives

Engaging Industry

Each center will engage a representative and diverse group of industry professionals in **rich, interactive networks** connecting them to each other and higher education for ideas, solutions, and support for workforce development strategies.

Enhancing Education

Centers will be **a catalyst and conduit** for the latest industry knowledge to benefit our faculty and staff and to provide students with an **innovative, high quality** education.

Inspiring Students

Centers will provide high school and college students with opportunities to meaningfully expand their knowledge of careers and to **acquire skills and knowledge** for their chosen profession.

Content in Key Program Areas



Explore Engineering

Engineering Machine Design Contest
Reverse Engineering Challenge
Explore Engineering Curriculum & Kits
Explore Engineering Day Camps
Lean Leader Lab Curriculum
Engineering Educational Card Games



Project/Problem-Based Curriculum

Siemens STEM Curriculum
Advanced Career & Middle Grades STEM
Project Lead the Way
Minnesota SkillsUSA
Science & Engineering Fair
We Share Solar



Professional Development

STEM Educator Workshop
Workforce Partnership Seminar
MEET Conference
Educator Externship - Trades in Every Classroom
Engineering Design for Everyone Workshops
Siemens Summer Teacher Training

The Lean Learning Lab: Introducing Students to STEM Careers



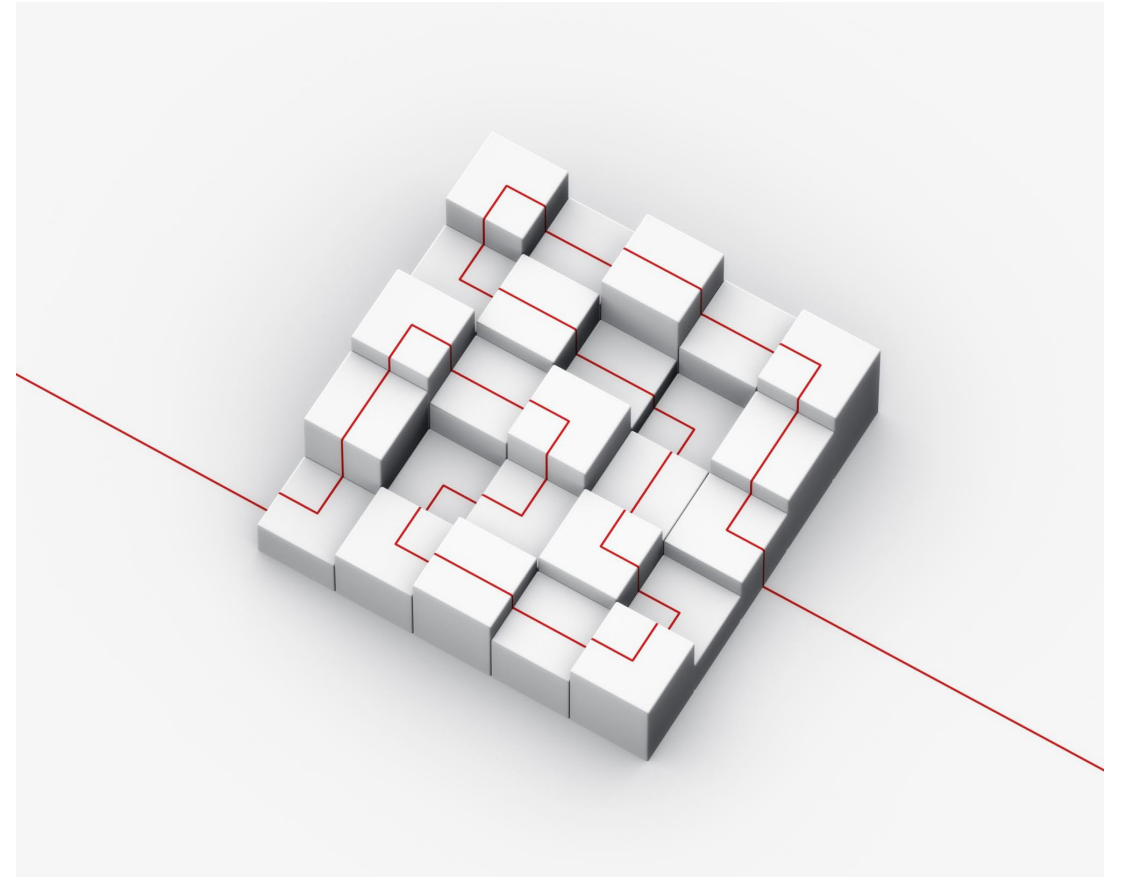
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Lean Leader Lab Modules

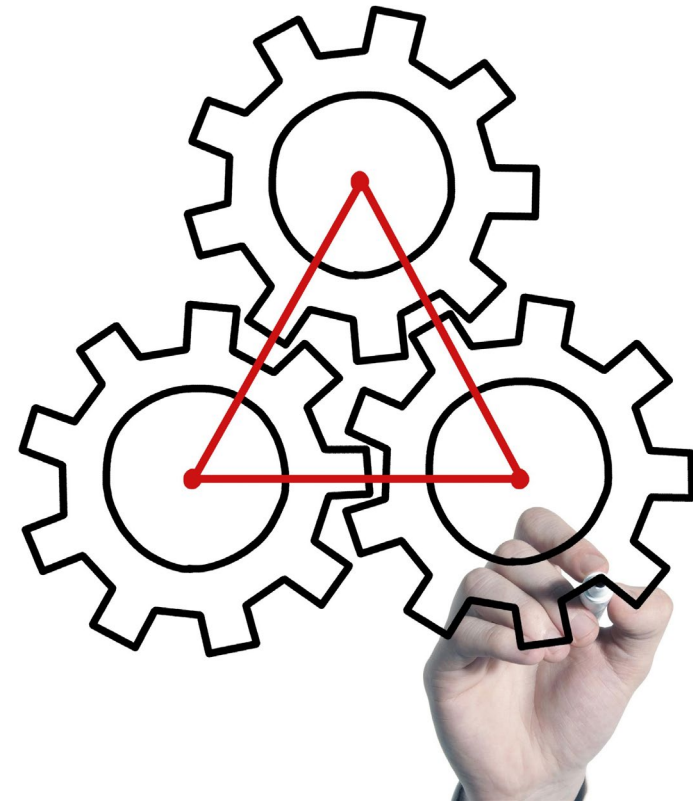
- Spaghetti Diagrams & Waste Identification: Recognizing and categorizing the 8 types of waste in processes.
- 5S – Workplace Organization: Applying the 5S methodology to organize and optimize workspaces.
- The Art of Communication: Developing key communication skills for team effectiveness and efficiency.
- Team Building – The Bridge Builders' Quest: Strengthening teamwork and collaboration through creative problem-solving.

Connecting learned concepts to practical, real-world scenarios and STEM careers.



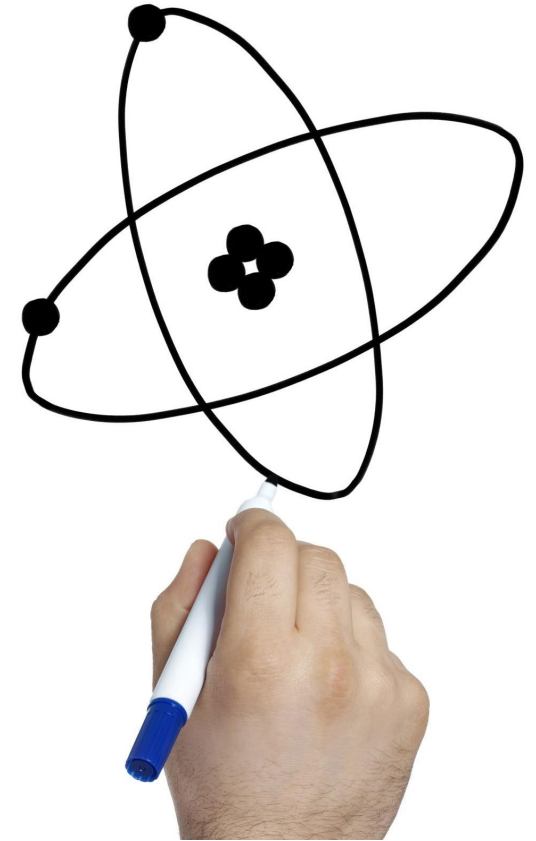
Lean Leader Lab Modules Overview

- Engage students in collaborative challenges to design and build structures.
- Teach process efficiency by mapping movement patterns to identify waste and optimize workflows.
- Introduce the 5S methodology for organizing spaces to boost productivity.
- Develop verbal and non-verbal communication skills, crucial for teamwork and waste management.



Connection to STEM Careers

- Emphasize forming, norming, and performing phases—mirroring team operations in STEM professions like engineering.
- Provide a practical understanding of Spaghetti Diagrams and 5S methodology, essential for roles in industrial engineering and operations.
- Cultivate critical communication techniques, aligning with careers that require clear, concise, and strategic interaction.
- Explore career paths in engineering (e.g., Civil, Mechanical, Industrial), operations management, and environmental & systems engineering.



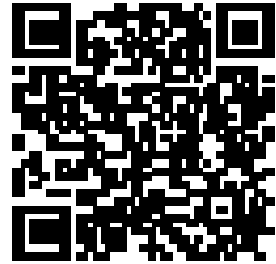
Alignment with Engineering Machine Design Competition (EMDC)

- Enhanced group collaboration and efficient role distribution through Team Building
- Improved movement efficiency through Process Mapping (Spaghetti Diagrams)
- Streamlined workspace organization and safety through 5S Implementation
- Clear communication and efficient problem-solving through Communication Skills
- Reinforcement of practical applications of Learning principles



QR Codes for Lean Leader Lab Modules and High Tech Kids MN DEED Grant

- Scan the QR code to access Lean Lab Modules



- Scan the QR code to access High Tech Kids MN DEED Grant

