

# E4 Conference 2010

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Excellence in Elementary Engineering Education



January 28, 2010  
St. Catherine University  
Coeur de Catherine Building  
St. Paul, Minnesota

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# E4 CONFERENCE 2010

EXCELLENCE IN ELEMENTARY ENGINEERING EDUCATION

JANUARY 28, 2010

## Schedule

Check in . . . . .	7:30 — 8:00
& refreshments	
Keynote . . . . .	8:00 — 9:15
Session 1 . . . . .	9:30 — 10:45
Session 2 . . . . .	11:00 — 12:15
Lunch +	} 12:15 — 2:15
Exhibits +	
Session 3	
Session 4 . . . . .	2:30 — 3:30

## Keynote

8:00 to 9:15 am

### Welcome BALLROOM

*Yvonne Ng, St. Catherine University & The Works*

### The Joy of Engineering BALLROOM

Who are engineers, and what do they do? Breaking the stereotype of Dilbert-esque nerds with pocket protectors who work in cubicles, engineers hold some of the most exciting careers imaginable.

Dr. Thomas will talk about the diversity of experiences that engineers have, as well as her personal path in engineering which has ranged from creating conductive playdough to searching for shipwrecks with autonomous underwater robots.

*AnnMarie Polsenberg Thomas, University of St. Thomas*

## Session 1

9:30am to 10:45 pm

### Designing and Building the 35W Bridge BALLROOM

Take a front seat tour of modern bridge design, featuring the construction of the new 35W bridge. Learn about challenges ranging from embedding ice sensors to pouring concrete at 20 below, all under tight time constraints. Find out how 1800 Minneapolis 5<sup>th</sup> graders were involved with the design.

*Tom DeHaven, Figg Engineering*

### Gearing Up: How to get started ROOM 355

Engineering, projects, integration, teamwork...where do I start? Explore your teaching style, your learning style and how teaching engineering can benefit all students.

*Yvonne Ng and Lori Maxfield, St. Catherine University*

### Intro to “Engineering is Elementary” SIDE BALLROOM

What can a plastic spoon, a glue stick, and a recipe card help you learn about technology and engineering? Tap into your prior knowledge, begin making new connections, and find out more about Engineering is Elementary.

*Sharlene Yang, Boston Museum of Science  
Maija Sedzielarz, Science Museum of Minnesota*

### Circuits, Switches and Invention ROOM 362

Explore basic circuits and make a magic wand, then learn about the invention process as it relates to science and engineering.

*Steve Walvig and Cheryl Moeller, Bakken Museum*

### Invite An Engineer to your School ROOM 370

Find out how to bring an engineer to your school for an educational program and how to create the best experience for your students.

*Matt Thell, General Mills  
Jennifer Neby, Minnesota Society of Professional Engineers  
Taylor Pettis, Minnesota High Technology Council*

### Sketch-Up as a design tool for engineering projects 1st floor LIBRARY, ROOM 110

Here's a free, easy to use software program that adds excitement and mathematics to the engineering design process for upper elementary students.

Learn how one school uses Sketch-up, then grab a mouse and try it yourself.

*Doug Paulson, Monroe Elementary School, Anoka-Hennepin*

“ Desire, not necessity, is  
the mother of invention. ”

- Henry Petroski

## Session 2

11:00 to 12:15pm

### Engineers: **BALLROOM**

#### Who we are, what we do and why it matters

Explore engineering with a dynamic group of women engineers who love sharing their profession and hands-on projects with kids . . . and with you!

*Sara Beck, Mechanical Engineer, Transoma Medical*  
*Anita Hall, Agricultural Engineer, General Mills*  
*Amy Homuth, Chemical Engineer, (Packaging) General Mills*  
*Lindsey McKenzie, Civil Engineer, Short Elliott and Hendrickson*  
*Allison Pederson, Electrical Engineer (Software Design), Goodrich*  
*Holli Pheil, Electrical Engineer, Boston Scientific*  
*Cassie Svendsen, Biomedical Engineer, Cardiovascular Systems*  
*Lesley Wyckoff, Mechanical Engineer, Stratasys*

### H.O.T.S. are cool **ROOM 355**

Engineering is a great way to teach Higher Order Thinking Skills in your classroom. Find out why HOTS are important for every child and how they can be used to increase knowledge of STEM subjects.

*Wendy Behrens, Gifted and Talented Specialist, MN Dept of Ed*

### Wind Energy **SIDE BALLROOM**

Tap into expertise and kits from KidWind to explore real world developments in sustainable energy and hands-on projects on wind power and turbine design.

*Joe Rand, KidWind*  
*Matt Hardy, Cedar Ridge Elementary, Eden Prairie Schools*

### Play With Your Food **ROOM 370**

Explore chemistry, mechanisms and materials testing by playing with food.

*Jane Copes, Science Outside the Box*  
*Matt Thell, General Mills*

### Tech Take Apart **ROOM 362**

See how an electrical and a mechanical engineer look at machines, then dive in and take apart VCRs, computer peripherals and other gizmos.

*John Bushey, MTS*  
*Richard Pollard, University of Minnesota*

### Integrating Engineering into Science Inquiry **ROOM 495**

Explore how a hands-on science inquiry activity can be adapted to incorporate engineering concepts and processes.

*Joel Donna, University of Minnesota*

## Lunch + Exhibits

12:15 to 2:15

### Lunch **1st floor CAFETERIA**

With the lunch ticket in your registration packet, you can choose your meal in the St. Catherine University cafeteria on the 1st floor of this building (Coeur de Catherine.) Lunch service is available from 11 am to 2 pm. You may eat your lunch in the cafeteria, or take it upstairs if you'd like to attend a presentation.

### Exhibits: Elementary Engineering Extravaganza **BALLROOM & SIDE BALLROOM & 3rd floor ATRIUM**

Enjoy information and hands-on projects from

- SWE: Society of Women Engineers (steady hand game, Geodomes, Eggmobiles, asphalt cookies and more...)
- The Works (mini flashlights & Beebot robots)
- KidWind (wind turbine design)
- Boston Museum of Science (Engineering is Elementary)
- NASA (free aerospace curricula and resources)
- Minnesota Space Grant (Aerospace experiments)
- The Bakken Museum
- Science Outside the Box (fuel cells)
- Lego Educational (lots of Legos)
- University of St. Thomas (conductive Playdough)
- ITEA: International Technology Education Association

## Session 3

1:15 to 2:15

### Note:

If you would like to attend one of the presentations in Session 3, you need to explore the exhibits and grab your lunch before 1:15. It is fine to take your lunch from the cafeteria back upstairs and eat during the session.



## Session 3

### 1:15 to 2:15

#### **Integrating Technology, Engineering and Environmental Studies**

**ROOM 355**

Learn how teachers at a STEM magnet school integrate engineering and technology into an advanced science curriculum based on authentic inquiry and citizen-science projects. Check out online curriculum development (Moodle), tools such as LabQuests and Proscopes, and web 2.0 applications for global interaction.

*Lisa Koch, Curriculum Integration Coordinator, Osseo*  
*Laurie Toll, Technology Integration Collaborative Teacher, Osseo*

#### **Engineers Without Borders**

**SIDE BALLROOM**

Find out how young engineers make a difference by designing and building ways to bring fresh water, sanitation, power, products and hope to communities around the world.

*John Frieseke, University of MN chapter Engineers without Borders*

#### **Sustainable Partnerships: Finding Resources in your own Community**

**ROOM 362**

Education administrator and college faculty discuss how to plan, implement and sustain useful engineering partnerships found in your community and region.

*Debbie Belfry, Bloomington Public Schools*  
*Nancy Louwagie, Normandale Community College*

#### **The EggMobile**

**ROOM 370**

Roll up your sleeves and try out this team oriented design activity focusing on automotive crash safety engineering and project management. Build a vehicle using interesting supplies to transport a raw egg under design, budgeting and testing constraints. Perfect for G4 to G6.

*Anita Hall, Society of Women Engineers and General Mills*

## RESOURCES & FOLLOW-UP

**Get insights into elementary engineering, lesson plans you can use, handouts and video clips from the 2010 E4 conference and more online. Network and share ideas with other elementary engineering educators, too.**

**<http://elementaryengineering.ning.com>**

## Session 4

### 2:30 to 3:30pm

#### **Engineering in the Revised Science Standards**

**BALLROOM**

Learn how the 2009 revision of the Minnesota Science standards will focus learning for your students. Explore the changes in the standards including grade shifts in concepts and the new engineering standards. Gain ideas for imbedding new concepts into your current instructions and strategies for planning the transition.

*John Olson, Minnesota Department of Education*

#### **Hands-on Engineering Design**

**ROOM 355**

Go through a kid friendly engineering design process that meets the new Minnesota standards, then try it out yourself with a fun engineering challenge called "What Floats your Boat?"

*Heidi Eschenbach and Jessalyn Johnson, The Works*

#### **EiE Teachers: Why Do I Have to Know This?**

**SIDE BALLROOM**

How can we use engineering design challenges as a way to give context to science content and inspire inquiry? Let's create a parachute that falls at a specific rate! We'll explore how this hands-on activity can inspire students to ask and answer their own science questions. This presentation is designed for teachers already using the 'Engineering is Elementary' curriculum from the Boston Museum of Science.

*Sharlene Yang, Boston Museum of Science*  
*Maija Sedzielarz, Science Museum of Minnesota*

#### **Integrating Engineering and Math**

**ROOM 362**

Find out how to use the "Everyday Math" curriculum to integrate mathematics into STEM for primary grades K-G2. Our time is very precious in schools and through integration we are able to dive deeper with greater student understanding and comprehension.

*Doug Paulson, Monroe Elementary School, Anoka Hennepin*

#### **Aerospace and how to teach it to kids**

**ROOM 370**

Roll up your sleeves and launch gliders, build parachutes, play with rockets and more with experienced teachers and aerospace experts.

*James Flaten: Minnesota Space Grant*  
*Jill Wall: Farnsworth Aerospace Elementary School, St. Paul*

**For more information:  
[www.theworks.org](http://www.theworks.org)  
[E4conference@theworks.org](mailto:E4conference@theworks.org)**