

Mother Daughter TEA Workshop (Technology Engineering Aptitude)

*Concept, Overview and Guidelines for a
Safe and Successful Event*



Engineering Education
Service Center

www.engineeredu.com



Mother Daughter TEA Workshop

Educating and Motivating our Future Engineers

Overview

The Mother Daughter Technology Engineering Aptitude (TEA) event provides middle school girls with a tremendous opportunity to interact with an engineering professional to learn about valuable, high-wage opportunities in the engineering industry. The Mother Daughter TEA event was founded to encourage young women to take an interest in pursuing a career in the engineering industry.

The engineering industry is facing a severe shortage of skilled young talent. In an attempt to fill open positions and careers, the Mother Daughter TEA event exposes girls to the engineering industry and the skills involved. Local students from the nearby and surrounding communities are invited to participate in this one day event.

After an introductory orientation, mothers and daughters are grouped into teams with other girls to apply the skills, tools and imagination required to become a successful engineer. Participants discover the many dimensions of engineering that are available and its vast career opportunities. The Mother Daughter TEA event successfully engages young women and providing options for a transition into challenging classes and life-changing pursuits.



The session leader oversees hands-on activity progress.

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Our beginnings...

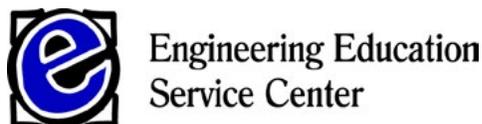
The Mother-Daughter Technology Engineering and Aptitude (TEA) event was developed and presented by the Centers of Excellence for Aerospace and Advanced Materials Manufacturing Center of Excellence at Edmonds and Everett Community Colleges and Marine Manufacturing & Technology at Skagit Valley College, Whidbey Island Campus along with workshop leader and biomedical engineer, Celeste Baine of the Engineering Education Service Center (www.engineeringedu.com). The day provided the opportunity for the girls to learn about and experience first-hand what technical and engineering careers are by showcasing the creativity and teamwork associated with these careers. The TEA aligns perfectly with the Science Technology Engineering and Math (STEM) and Manufacturing career and educational clusters used by the state. Careers in advanced manufacturing offer exciting opportunities in the design and improvement of products, operating high-tech tools and machinery, analyzing problems and coming up with creative solutions. Students in STEM and Manufacturing pathway classes learn and practice skills that prepare them for the diverse post-high school education and training opportunities available in Washington State, from apprenticeships and two-year college programs to four-year college and graduate programs. Classes in these clusters introduce students to variety of interesting careers including: Chemist; mathematician; engineer: aerospace, industrial, biotechnology, chemical, marine, materials, civil, petroleum; architect; naval architect; architectural or civil drafter; materials lab and supply technician; and manufacturing technician.

"It is so important that young students and parents learn more about the growing need for technicians, scientists and engineers at all levels of advanced manufacturing. We want young girls, their families and teachers to understand the many career and education options available to them," said Mary Kaye Bredeson, director of the Aerospace and Advanced Materials Manufacturing Center of Excellence. "Advanced manufacturing in Washington State is thriving and the career opportunities are virtually unlimited."

Through partnership with the Office of the Superintendent of Public Instruction (OSPI), teachers attending the event were also able to earn professional development clock hours.

"Celeste, as always, did a wonderful job keeping her audience engaged and enthusiastic throughout a day full of activities, the feedback we've received so far reflects that and has been 100 percent positive, it's exciting to see how this event is evolving" said Ann Avary, director of the Marine Manufacturing & Technology Center of Excellence.

Additional information can be obtained by contacting:
Celeste Baine (541)988-1005 or celbaine@engineeringedu.com
Mary Kaye Bredeson at (425) 388-9987 or mbredeson@everettcc.edu
Ann Avary at (360) 679-5356 or ann.avary@skagit.edu



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Behind the Scenes...

The idea for organizing a mother-daughter engineering workshop came from the notion that a supportive environment at home that encourages engineering and technological careers offers young girls an extraordinary opportunity to develop non-traditional interests and aspirations. Mothers were involved to expose them to the kinds of engineering careers that are available and to influence them to encourage their daughters to learn more about engineering.

Because women make up 51 percent of the population, 45 percent of the nation's work force, and only 11 percent of the engineering workforce, more needs to be done to reverse this trend.

The goals of the workshop are:

- For participants to increase positive feelings about engineering and technological careers;
- To further develop their problem-solving skills (especially those involving hands-on building and spatial visualization);
- To become familiar with women's contributions to the world of engineering; and
- To help participants see how engineering is one of the best ways to help people, promote a healthy environment and make a huge contribution to society.

Numbers and Statistics

Since the beginning of The Mother Daughter TEA in 2009:

- 1834 mother and daughter teams have participated in the program.
- 96% percent of students are considering engineering as a career path.
- 99% percent of parent participants consider their daughter attending college a top priority.



Mother Daughter TEA Workshop

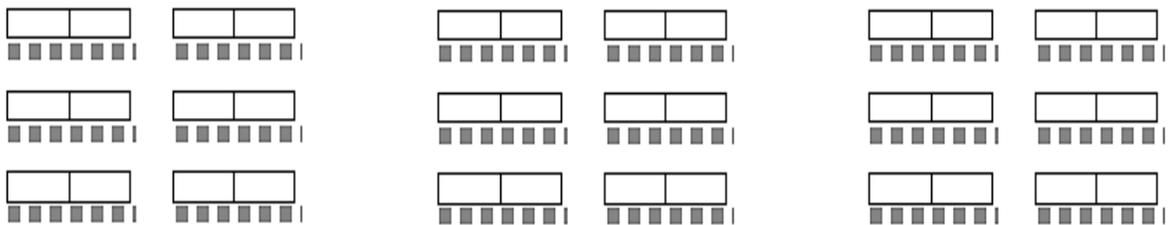
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Planning Your Day

Workshop criterion:

- Poster/Flyer - Posters and flyers for advertising the event are needed. Sample poster is included in appendix.
- Equipment - Audio visual equipment
 - a. Power point projector
 - b. Lap top
 - c. Speakers
 - d. Cordless microphone
- Room Schematic – Room needs to be able to hold at least 80 persons setup in classroom style with rectangular tables if possible. Students need to be able to work on their hands on projects unencumbered. Projects are usually team oriented, two girls to a project with mom's looking on (not doing the project for them) or mothers and daughters working together. Workshop presenter is located at the front of the room with screen in background and two tables nearby displaying materials, books and kits used for the workshop.

Classroom



Classroom style room setup

- Sponsorship opportunities - local businesses and industries along with local government agencies and professional organizations have an opportunity to sponsor the workshop. Engineering kits can have the sponsors logo's placed on packaging to promote community efforts in engaging young students - particularly the non-traditional student in learning about engineering pathways and careers.

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Timeline for the event:

- Six Months prior to event
 - Marketing of poster/flyer in schools through list serves, home school network and Girl Scout contacts.
 - Securing a venue for the workshop
 - Soliciting sponsors for the event
 - Securing a calendar date for Celeste Baine's availability
- Three Months prior to event
 - Continued marketing of event through contacts and list serves
 - Invite dignitaries that you would like to have come so that they have it on their calendars
 - Securing caterer/food for the event – light breakfast, lunch and snacks
 - Continued sponsorship requests
 - Solicit STEM Teachers to attend – we provided each STEM teacher who had 5+ girls attend the workshop with a free resource kit of engineering activities, videos, and reference materials valued at \$120.
- One month prior to event
 - Order workshop toolkit from Engineering Education Service Center and other supplies if needed (extra resource kits, T-Shirts for girls, posters etc.)
 - Organize list for registered girls and moms and teachers and follow up
 - Secure a photographer
 - Order food for the event
 - Make sure AV and computer equipment is available for workshop
 - Send out Press Releases to local newspapers and TV stations
 - Make hotel and travel arrangements for workshop presenter
- One week prior to event
 - Final head count for food is placed
 - Print out list of attendees and phone call or email confirmation
 - Print out name badges
 - Check on room schematics and AV equipment

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The Big Four

Listed below are the key components for your TEA event.

1. Session leader

Ideally, Celeste Baine, a female engineer and educator, is designated as the session leader. She can enthusiastically lead students and mothers/guardians through the activities and demonstrate the exciting opportunities available in the engineering field. Other trainers (i.e. professional engineers or engineering educators) can be trained to give the workshop but only trained professionals are recommended. Typically, the session leader begins with an overview of the multitude of skills, talents and interests that can be applied to engineering. She then guides participants through the presentation and engages participants with videos, contests and hands-on activities.

2. Hands-on activities

Hands-on activities take complex engineering concepts and transform them into comprehensible fun projects. The activities challenge participants to build a structure of drinking straws and paper clips, or to make a hovercraft using nothing more than a balloon, a CD, masking tape, pipe cleaners and plastic rings. Students learn practical applications of engineering concepts. For example, the session leader can introduce Uv-sensitive beads engineered to change color as sun exposure increases, alerting individuals to the over exposure of Uv radiation. By incorporating activities involving entire groups working together to achieve a common goal, participants recognize the importance of team-building skills in engineering.

3. Morning Refreshments

Upon arrival, participants sign in and are provided with refreshments of coffee, water, juice and snacks - this allows participants to interact and socialize before the event begins. Lunch is a fundamental component to the success of this event. Lunch can be catered or kept cold and should be accompanied by drinks. This is served midway through the event. Later, large portions of desserts such as brownies or cookies are provided. These sweets are a major component to the event and portions should not be underestimated.

4. Promotional take-aways

Promotional take-aways should include a hands-on project that the mother and daughter can work on together at home, t-shirts and booklets for the students. Teachers in attendance should receive a resource kit that includes a book of hands-on engineering activities, videos and a library of reference materials.



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Timelines & Guidelines

The Mother Daughter Technology Engineering Aptitude (TEA) event is a one day event allowing for flexible dates and timelines. Doors open at 8 a.m. for sign in and morning refreshments. The event begins around 9 a.m. and runs until 1:00 p.m. Request an early arrival from all participants to ensure prompt registration, typically before 8:30 a.m. During the first half of the event students are presented with fun information and hands-on activities familiarizing participants with engineering components and concepts. Midway through the event, lunch is served. During the second half of the event, more hands-on activities and group projects are introduced. At the end of the event, participants are given promotional take-aways and prizes and an evaluation of the event can be filled out at this time (or during lunch) by participants.

The coordination of a session leader and volunteers in order to provide fun and interesting activities for a large (typically about 60- 80 persons, including parents/guardians) amount of participants can be overwhelming. For a first-time event, you may want to begin planning a month or two earlier.

- 8:30 AM Registration and Continental Breakfast -
- 9:00 AM Welcome, Icebreakers & Introductions
- 9:55-10:45 How Do I Hover?
- 10:45-10:55 Break
- 10:55-11:30 The Whale Band-Aid
- 11:30-12:00 Working Lunch
- 12:00-12:50 Protect Your Noggin
- 12:50-1:00 Questions, Wrap Up



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Training the Trainer

Twice a year, the Engineering Education Service Center will offer a training of the Mother Daughter TEA workshop. Each trainee will receive an instruction book for holding the Mother Daughter TEA and take home a toolkit that will enable them to host their own TEA workshop upon their return.

The TEA Toolkit for workshop presenters is an easy and exciting, time and work-saving kit. It was developed to help presenters teach engineering. Whether you are an educator or a professional engineer, this workshop is sure to give you plenty of ideas on how to engage girls and their mothers. If you want every girl to consider an engineering career, this toolkit is your answer!

Hands-on activities integrating science concepts, technology skills and tools, and mathematical processes provide contextual learning opportunities in a STEM environment. These activities parallel real-world engineering tasks and problem-solving opportunities. By using this powerful workshop toolkit, you will be able to show both mothers and daughters that engineering is not something to be afraid of but a realistic way to solve the problems of everyday life and a very viable career opportunity! The lessons and activities will actively engage girls in learning about engineering and our technological world by applying creativity and innovation as they complete the projects.

Celeste Baine, the workshop leader, is the winner of the Norm Augustine Award for being one of those rare individuals that can show the wonder and excitement of engineering. She is one of the top speakers on engineering education and motivating students. Celeste will make this workshop an enormous success! She is a high-energy, high content, how-to speaker. You will leave the workshop armed with instructions and materials. And, you will be ready to give your own Mother Daughter TEA workshop in your community!



To attend a workshop, visit www.celestebaine.com

** Only workshop participants are eligible to purchase the Mother Daughter TEA toolkit refills.*

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Pricing Information

1. Bring the Mother Daughter Workshop, facilitated by Celeste Baine, to your location. Celeste Baine is a biomedical engineer, author of over 20 books on engineering education and careers, and director of the Engineering Education Service Center based in Eugene, Oregon. She was acknowledged for her outstanding accomplishments in motivating and inspiring students to pursue careers in engineering. Winner of the Norm Augustine Award, Ms. Baine is credited for being an outstanding contributor to the nationwide efforts to increase engineering student enrollment.

The day includes:

1. All materials needed to engage no more than 40 Mother/Daughters teams in hands-on engineering activities for the entire workshop. These activities parallel real-world engineering tasks and problem-solving opportunities. Activities are customizable but usually include solving problems, building tabletop hovercrafts, designing towers and placing a band-aid on a Whale.
2. A take-home engineering project for each girl. This is usually a UV bead kit to understand how chemical, biomedical, and materials engineers are involved in curing or slowing skin cancer.
3. A copy of *Ideas in Action: A Girl's Guide to Careers in Engineering* for each girl. It is also possible to upgrade to *Is There an Engineer Inside You?*
5. Teaching Engineering Made Easy Resource Kit for each teacher (up to four). By using this powerful teaching kit, teachers will have an instant library of curriculum, career resources, classroom strategies, and inspiring information at their fingertips. This kit also gives classroom teachers an easy and dynamic way to meet curriculum standards and competencies. The lessons and activities will actively engage students in learning about engineering and our technological world by applying creativity and innovation as they complete the projects. Coupled with professional development, many teachers will enjoy teaching engineering because it combines math and science lessons, team building and creativity with a practical twist. Students learn to work together, increase their communication skills and enhance their presentation abilities.

Package Cost: \$3795 (West Coast) or \$4195 (East Coast) + \$90 shipping + travel expenses.

2. Train the Trainer – Attend a 1-day professional development workshop and leave with your own toolkit to hold a Mother/Daughter TEA in your location. Minimum of 12 registrants.

Toolkit includes:

1. All materials needed to engage 40 Mother and Daughter teams in hands-on engineering activities for the entire workshop.
2. 40 UV bead kit take-home engineering projects (optional).
3. 40 Mother Daughter TEA T-shirts (optional)
4. 40 copies of *Ideas in Action: A Girl's Guide to Careers in Engineering*.
5. Teaching Engineering Made Easy Resource Kit.

For more information and a schedule, contact Celeste Baine (celbaine@engineeringedu.com).

Packages Start at \$799 person - cost depends on kit options.

TECHNOLOGY • ENGINEERING • APPETITUDE MOTHER • DAUGHTER TEA



A free event with Celeste Baine

MAKE A:
hovercraft
bridge
rocket
tower
indy car

10 am-2 pm | Oct. 24, 2009

Keithly Middle School

12324 12th Ave S, Tacoma, WA

For more information please contact:

Lois Noble at 253-298-4443

Engineers change the world. Engineers fix things. Engineers are your new best friends. Engineers love science. **Engineers innovate.** Engineers wear white coats after Labor Day. Engineers wear jeans. Engineers are the new black. **Engineers invent the future.** Engineers keep it real. Engineers build bridges. Engineers make things tiny. Engineers make things big. **Engineers make things work better.** Engineers rearrange molecules. Engineers improve our lives. Engineers design. Engineers create. Engineers ask questions. Engineers find answers. **Engineering is fun.**

