LEAD

Becoming an Impactful Voice to the Next Generation of Talent
The development and content of this guide would not have been possible without the support and guidance from manufacturing companies that have made a commitment to the STEP Ahead Women in Manufacturing initiative. These companies understand the importance of making women aware of and attracted to the great opportunities available through manufacturing careers. Without strong partnerships like these, we would not be able to continue to develop powerful industry best practices and leadership development tools for our manufacturers.

The Manufacturing Institute would like to thank APICS for sponsoring this toolkit in addition to the following company partners for their active participation and leadership in the development of this guide: Ingersoll Rand, BASF, Alcoa, Caterpillar Inc., Sandvik Coromant, ALOM, Harley-Davidson Motor Company, Jabil, Noven Pharmaceuticals Inc., Coverstro, GLOBALFOUNDRIES, Driv-Lok, Inc. and Baldor Electric Company.
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MANUFACTURING MATTERS
WHY MANUFACTURING?

Americans consistently voice their support of the manufacturing industry and express the importance of manufacturing to the economy and to job creation. The manufacturing industry truly matters to Americans. Below are a few of the advantages that made American manufacturing the envy of the world for most of the past century.

- For every $1.00 spent in manufacturing, another $1.37 is added to the economy. This is the largest multiplier of any sector.
- Manufacturing remains among the most important industries in terms of helping maintain a strong national economy.
- If given an opportunity to create 1,000 new jobs in their community, Americans rank manufacturing first.
- When it comes to world-class manufacturing, America has a number of important advantages to build on. Americans believe the top competitive advantages in manufacturing are:
  1. Widespread use and availability of advanced technology
  2. Strong research and development capabilities
  3. Abundant energy and natural resources availability
  4. An unmatched network of suppliers and distributors
  5. High levels of quality
  6. A highly skilled workforce with a strong work ethic
- Not only is a more strategic approach to developing a strong U.S. manufacturing base desired, 82% of Americans believe the U.S. should further invest in the manufacturing industry.
- 77% of Americans believe a strong manufacturing base should be a national priority.
- Yet, despite this, only 35% of American parents would recommend a manufacturing career to their children. We in manufacturing face not only a skills gap, but an equally compelling reputation gap as well.
U.S. manufacturers today face a tremendous challenge finding quality talent to stay competitive in the global economy. Part of the solution is to do an even better job of attracting and unleashing the power of a growing and as yet underutilized manufacturing workforce demographic: Women.

Attracting women to manufacturing is easier said than done, however—that’s where you come in. By forming a strong network of ambassadors to lead the charge, we can attract the best and brightest women to careers in manufacturing. And that’s exactly what YOU are asked to do, with help of STEP Ahead.

The STEP Ahead Ambassadors Kit provides everything you need to begin engaging with female students and other young women in your region who will be entering the workforce.

- **Launch Support**: How to plan, launch, and succeed with a company-wide ambassadors program.

- **How-To Guides**: Step-by-step processes for simple student engagement activities that can be led by company Ambassadors such as classroom visits, facility tours, and Manufacturing Day.

- **Company Best Practices**: Detailed and actionable best practices that successful companies have used to attract, retain, and advance women in manufacturing.

- **Marketing Materials**: Attractive and actionable brochures, posters, and social media content targeted to students, parents, and educators.

- **Communications**: Sample communications for building partnerships in your community in support of your engagement.

- **Glossary**: A glossary of information that ensures every manufacturer understands their target audience.

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**Women and the Manufacturing Skills Gap**

Over the next decade an estimated 3 ½ million manufacturing jobs will need to be filled. The skills gap is expected to result in 2 million of those jobs being unfilled. 84% of manufacturers agree there is a talent shortage in U.S. manufacturing. Companies with high percentages of women officers had a 35% higher return on equity. Those familiar with manufacturing are 2× as likely to encourage a child to pursue manufacturing. Women represent 47% of the total U.S. labor force, but only 27% of the manufacturing workforce. 2/3 of women indicate standards of performance are not the same for men and women. STEP Ahead has honored over 600 women across the United States and engaged over 150 companies to help close the gender gap.
When American industry faced a depleted workforce during World War II, Rosie the Riveter became an iconic symbol of women on the front lines of manufacturing.

Women have been making significant contributions to manufacturing for decades, but only 27 percent of the manufacturing workforce is made up by women today.

The Manufacturing Institute created STEP Ahead to recognize the contributions of women to manufacturing, to tell the story of real women who are making a difference every single day, and to shine a light on the untapped opportunities for women in a rewarding field.

The goal of the STEP Ahead Initiative is to create a network of female ambassadors who work to attract the next generation workforce and to serve as role models to women who are just starting careers in manufacturing.

Women who are recognized as STEP Ahead honorees and emerging leaders through our awards program are invited to become a part of the ambassador network. Those who accept make a pledge to help advance women in manufacturing and promote the importance of a diverse workforce.

"The opportunities for women to step forward together in manufacturing will deliver great value. Through powerful networking and mentoring connections, we are developing new approaches to improve the female leadership pipeline across manufacturing," said Heidi Alderman, SVP, Petrochemicals, BASF and incoming STEP Ahead Chair.

Ambassadors commit to encourage women to pursue careers in manufacturing and helping them to succeed by:

- **Leverage Your Strengths for Personal Development**
- **Engage and/or Mentor Young Women/Girls**
- **Advocate as an Ambassador for the Manufacturing Industry**
- **Develop Your Network to Generate Ideas and Share Best Practices**

This toolkit is a call to action for manufacturers to join with STEP and lead the charge in attracting more women to the manufacturing workforce. By tapping into our network of women already recognized for their contributions in manufacturing, we expand the impact of the STEP Ahead Initiative in recruiting more talent in to high technology manufacturing careers.

To see the stories of previous honorees and to view their personal profiles, click here.
There are numerous personal benefits to becoming an ambassador, including:

- The chance to make a difference in the lives of young adults, increase their confidence, and expose them to the exciting careers available in manufacturing.

- The opportunity to become a part of a national network committed to closing the skills gap using a strategy endorsed by the National Association of Manufacturers.

- An approach for representing all functional areas of manufacturing. Ambassadors can be:
  - Early career
  - Women
  - Veterans
  - Specific occupations

- An opportunity to leverage national resources, including how-to guides, marketing materials, presentation templates, and more all found within this toolkit.

- A low-cost, high-impact community engagement strategy created by manufacturers for manufacturers that has been proven to improve the talent supply and increase exposure to manufacturing careers.

The benefits to companies who participate in the STEP Ahead Ambassadors program are:

- Increased company awareness of potential manufacturing careers at high schools, community colleges, and staffing agencies.

- A retention strategy that places importance on diversity of employees and provides them with a professional development opportunity to be a voice for the company and the manufacturing industry.
Now that we’ve explained why it’s important to become involved in the STEP Ahead Ambassadors program, let’s get started! This Quick Start Guide outlines steps to successfully engage with young female talent in your region.

**NUMBERS TALK**

The skills gap is apparent to most manufacturers, but it can be difficult to communicate the impact to those outside the industry. The good news: there are a number of resources and strategies to help illustrate this problem. Here are a few places to start:

- Browse through *Boiling Point? The Skills Gap in U.S. Manufacturing*. A good resource for breaking down the research that demonstrates the severity of the skills gap.
- **Minding the Manufacturing Gender Gap**, How manufacturers can recruit more talented women.
- Graph the ages of your own employees and understand where the challenge falls within your own company. Is the majority of your own workforce nearing retirement like other manufacturers? Do you have a younger wave of employees who will fill their roles?
- Talk to student groups and teachers. What are their perceptions of manufacturing? Do their answers accurately reflect 21st century manufacturing?

**ORGANIZE YOUR IMPACT**

This Ambassadors Kit will help you to impact your skills gap by enabling you to engage with your future workforce. Taking this step requires a walk through of the entire Ambassadors Kit. Here are a few ways you and your organization can be a leader in educating your community about the opportunities in manufacturing.

- Select activities in this kit’s “What You (or Your Company) Can Do” based on the amount of time and resources you have, or that your company is allocating for engagement efforts.
- Select brochures and posters from the Marketing Materials chapter to customize and feature opportunities that exist at your company. These are good tools to engage students and keep them thinking about manufacturing beyond the classroom.
- Utilize the Education chapter to begin building relationships with local educators who will provide visibility to female students. Educators are always looking for opportunities for their students to learn from local employers, so they will be excited to hear from you.

**ENGAGE AND INSPIRE**

Once you select activities, it’s time to put the marketing materials to work. Providing parents, students, and educators with information about the wealth of opportunity available in manufacturing will help to engage and inspire your audience. Other engagement ideas include:

- Recruit other manufacturers in your community or in your supply chain to explore the STEP Ahead Ambassadors program.
- Consider providing more opportunities to local students like apprenticeships or internships.
THE AMBASSADOR PROGRAM
THE AMBASSADOR PROGRAM

Synopsis: The concept of STEP Ahead Ambassadors was created by Dream It. Do It. Nebraska, as a way to help students understand the global challenges and education paths to obtaining skills that lead to good paying careers in manufacturing. As a woman in manufacturing, you will be the ambassador within your company and community.

In this role, you will act as an industry ambassador to colleagues, area youth, young women, and your community. Ambassadors should be willing to share their experiences and expertise with both students and their community. You represent a population of female talent that needs a stronger representation within the manufacturing industry. This How-To Guide will provide the steps needed to support you in delivering a strong message to the youth and your community that the manufacturing industry is a skilled and purpose driven career option for everyone.

IMPLEMENTATION PROCESS

1. How Ambassadors Can Engage Others

- Mentor young women/girls through FabFems (see page 16)
- In-classroom presentations or visits (see page 18)
- Conduct facility tours (see page 24)
- Represent the company at local career fairs or industry events
- Connect with local youth organizations like Boy Scouts, Girl Scouts, or Boys and Girls Club of America
- Interview with local media
- Spotlight ambassadors in the brochures and posters provided in the Marketing Materials chapter

a. STEP Ahead ambassadors should naturally become the community engagement leaders.
2. Develop/Join an Employee Resource Group
   a. In a small organization, you may be the only female employee. In this case, try reaching out to a local WiM chapter (see page 31). Another option is to start your own employee resource group by reaching out to small/medium manufacturers in your community and invite their female employees to join your new group to network with other females within the industry, generate ideas and share best practices.
   b. In a larger organization, inquire with your HR department about joining your company’s employee resource group if they already have one, or discuss creating one for the organization.
   c. To learn more about employee resource groups, turn to the Manufacturers in Action chapter on page 29 and learn how other companies developed their groups.

3. Employee Resource Group Members as Ambassadors
   a. Once you have organized your group or joined an existing group, invite members to become ambassadors for the company and community. Provide ambassador training to those who sign on. Training activities could include:
      i. Hold an initial meeting with employee resource group members and provide them with a STEP Ahead Ambassadors Kit. Help them understand your student engagement objectives and the role ambassadors will play.
      ii. Ask ambassadors to review Communications chapter resources such as the In Classroom PowerPoint (page 38) and the Industry Talking Points (page 53). This provides a good starting point for building the message they will deliver. There are also materials geared toward young women and girls ambassadors can use to engage young women in presentations.
      iii. Ask ambassadors to build a few personal slides into the In Classroom PowerPoint (page 38). These slides should represent their personal story and include information on the path they took to achieve success in a manufacturing career.
   b. Practice makes perfect, so practice your presentation. A compelling personal story can be a highly effective way to ensure the message resonates with an audience and is remembered.
   c. Once your ambassadors’ presentations are polished, begin looking for ways they can engage students and the community as a whole.
WHAT’S YOUR STORY?

There are several things to consider when telling your story. First, you’ll want to start with the basics:
Name:
Age:
Your Role in Manufacturing (Job Title or Division):
Education Path (College, Degree or Certification):

Then, you will want to talk about what makes you you. Some questions to consider when developing your story include:

What attracted you to our company?

Please list some of your duties:

What are the best/most interesting things about your job?

What is the most rewarding thing about your job?

What was your education path (Schooling, internship, major, change of major, etc.)?

How did you decide on this career path?

What kind of school, classes, and training most prepared you with the necessary skills?

What kind of technology do you use and interact with?

What advice would you give to students who are undecided on a career choice?

What do you think makes you a good Ambassador?

Are you comfortable speaking with students?

 Nichole Williams
Lean Six Sigma Black Belt
Cooper Tire & Rubber Company

“
The foundations of manufacturing are creation and innovation. Manufacturing allows anyone to get involved in those processes and take pride in a product they have helped to create. I believe this is part of what makes manufacturing so unique and is one of the reasons I’m passionate about it.”

Nichole Williams
Lean Six Sigma Black Belt
Cooper Tire & Rubber Company
AMBASSADOR TRAINING

With any public-facing employee, it is important to address a few topics before you begin interacting with students and the community. Take a moment to review the topic areas below. There are no right answers. These questions are unique to every person and every company.

TRAINING TOPICS

1. Ambassador Etiquette
   a. What is your role as an ambassador?
   b. What are appropriate topics to discuss, and what are not appropriate topics to discuss? If you are working within a company, this is an important topic to discuss organization wide.
   
<table>
<thead>
<tr>
<th>Appropriate</th>
<th>Not appropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal pathway, background,</td>
<td>Changes occurring within the organization</td>
</tr>
<tr>
<td>and education</td>
<td></td>
</tr>
<tr>
<td>Job responsibilities</td>
<td>Intellectual property not for public knowledge</td>
</tr>
<tr>
<td>Benefits of working at the</td>
<td>Negatives about working at the company</td>
</tr>
<tr>
<td>company</td>
<td></td>
</tr>
</tbody>
</table>

c. What is proper attire when serving as an ambassador?
d. If working with a company, how much time can an ambassador dedicate during working hours?

2. Ambassador Expectations
   a. Are ambassadors to set up events/activities or will that be done by another member of the organization?
   b. What is the target population of ambassadors? Students, parents, educators?
   c. Is there a limit to how many events/activities in which ambassadors may participate?
   d. How long will an ambassador serve in her role?
   e. How will you or your company measure success?

3. Ambassador Activity
   a. With whom should ambassadors form partnerships?
      • Schools
      • Non-profits
      • Student organizations
      • Dream It. Do It. programs
   b. How will the ambassador participate in Manufacturing Day?
   c. What will be the personal story of the ambassador?
   d. How often should these activities occur?
WHAT CAN YOU DO?
Title: Partnering with Programs/Organizations Serving Girls in STEM

Target Audience: Women and Students

Synopsis: The National Girls Collaborative Project is a nonprofit initiative to help connect people like you to programs that support girls in STEM. After doing a needs assessment and speaking with different program providers, NGCP found there were a variety of needs – needs for evaluation and assessment, strategies, mentors, volunteers, etc. Programs wanted to be connected to the business community, and at the same time, corporations were all asking the same questions, how can they get access to programs that work with girls? The idea of a collaborative network formed. Instead of creating one program, NGCP created an infrastructure to connect the people serving girls in STEM for greater capacity building and resource sharing. Today, NGCP connects people with each other, programs with resources, people with programs, and programs to each other.

Active in every state, NGCP serves 18 million girls via the 18,000 programs they support through their local connections. NGCP leverages their network to create a tipping point for gender equity in STEM and help organizations and people discover resources available across the United States.

IMPLEMENTATION PROCESS:

1. Becoming a Mentor/Mentee
   a. One resource offered through NGCP is its FabFems database. FabFems are women from a broad range of professions in science, technology, engineering, and mathematics (STEM) who volunteer as role models for young girls interested in STEM career pathways.
   b. With 800 women in the FabFems database, NGCP connects women in STEM with young girls interested in STEM-related careers on a state or local level. It allows women to create a profile and find opportunities for volunteer training and/or mentoring with students.
   c. Students interested in STEM also have the opportunity to visit the FabFems website to find a role model/mentor. Finding a role model can be filtered by state, city, region, field of work, program affiliation, and more.

2. Utilizing Resources
   a. The FabFems Project also offers a collection of resources for role models, educators, and parents, used to inspire and educate girls about STEM careers and courses.
   b. NGCP offers mini-grants awarded to girl-serving STEM programs to support collaboration. NGCP provides funding for capacity-building in states in such a way that even after funding is gone, 78% of collaborations persist.
   c. The NGCP national newsletter is distributed to 55,000 people every month. Recipients of the newsletter receive information about NGCP activities, other resources that may be valuable, upcoming events, funding opportunities, and more.

3. Connecting with Local Programs
   a. NGCP also operates The Connectory, a program database where anyone interested can sort through all of the National Girls Collaborative networks by programs in different content areas to see the needs and resources available.
      • Programmatic offerings vary, but are all related to STEM and, predominately, girls in STEM. Within the database, programs can also indicate any needs they might have, such as a need for volunteers or speakers for an event.
      • By offering the most comprehensive collection of STEM opportunities and programs, The Connectory is the go-to place to discover local STEM opportunities for young girls and for program providers to find with whom they can collaborate.
4. Attending an NGCP Event

a. Visit the NGCP website [here](#) to view a variety of upcoming events open for registration.
b. To attend a NGCP event, participate in local leadership, and stay current on girl-serving STEM activities in your community, [find the Collaborative](#) in your area.
c. Those who attend NGCP events feel they serve unique opportunities that no other organization is providing across all the different stakeholders.
   - When a person attends a NGCP event, she meets an average of eight new people and comes away with a sustained connection or partnership with at least two of those eight.

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**“PEARLS FOR TEEN GIRLS”**

Harley-Davidson puts on an annual event for PEARLS for Teen Girls, where girls 5th through 12th grade in Milwaukee come to the Harley-Davidson site to help expand their thinking about what their future could be. PEARLS is a unique leadership development program for girls that empowers them to live out the PEARLS values: Personal Responsibility, Empathy, Awareness, Respect, Leadership, and Support. PEARLS for Teen Girls is improving quality of life and strengthening the community one girl at a time by empowering young women with self-development tools, guidance, and support to strive for better, brighter futures.

*PEARLS for Teen Girls is an NGCP program*
Title: Classroom Visit

Target Audience: Students (all ages), Educators

Synopsis: Schools reserve limited time for their students to spend outside the classroom, but teachers everywhere welcome the opportunity to have employers come in and speak to their classes. Classroom visits are fantastic opportunities for manufacturers to bring the industry to the student and bring manufacturing careers alive.

The goal of a classroom visit is as diverse as the audience you are speaking to. For our youngest classrooms (K-5th grade), you are looking to emphasize the value of making things. For our middle school audiences (6th–8th grade), you are looking to underscore the need for STEM education, and for our high school audiences (9th–12th grade), you are looking to offer compelling reasons for the pursuit of a manufacturing career. This how-to guide will provide the steps needed to have a successful and impactful visit to your local classroom.

Required Planning Time: < 1 Month

IMPLEMENTATION PROCESS:

1. Getting Into the Classroom

   a. Manufacturers will often be invited to participate in classroom visits and discussions with students. Invitations can often be received through school boards, employer committees, and local chambers of commerce. Those are good starting points for locating classrooms for engagement.

   b. Another approach manufacturers can take is to do direct outreach to local educators. In the communications chapter of this Ambassadors Kit, there is a sample outreach letter to educators. Find a contact at your local high school or middle school and reach out with your interest to visit a classroom.

2. Preparing for Your Classroom Visit

   a. Have a plan for your visit. In all likelihood, your time in front of the class will be limited and will go by much quicker than you intended. Having a plan that is not only educational but also engaging will ensure a successful and impactful visit.

   b. Create a presentation that provides relevant and interesting information to your audiences. Important information that should be a part of your presentation includes the origin of your company, what products you manufacture, who your customers are, and how they use those products. You should assume that your audience has very little background knowledge on manufacturing and should consider addressing the question, “What is manufacturing?” at the beginning of your visit. A base presentation is available in the Communications chapter of this Ambassadors Kit. You can use this presentation and alter it to reflect your company and manufacturing in your region.

3. Sample Interactive Activities

   a. View activities on the next page for your classroom visit.

   b. The most memorable classroom visits will be the ones that are interactive for the student audience. There are a number of suggestions for classroom activities that are simple to prepare for but demonstrate what manufacturing is all about below.

   c. Consider a virtual facility tour for your student audience. This will bring the shop floor to the classroom! Visit www.manufactureyourfuture.com to review virtual facility tours that will grab students’ attention and act as a great pivot point into discussion.

   d. If appropriate, consider having an item that your student audiences can walk away with. This can be as simple as a bookmark or a widget from your facility. This is a way to provide a lasting impression and will ensure students continue to think about manufacturing when they leave the classroom.

4. Post visit

   a. Leave the students with your contact information and be open to discussion about manufacturing careers after your visit. If applicable, communicate internship and work-based learning opportunities that are available at your company or in your region.

   b. Provide information about upcoming tours at your facility or Manufacturing Day events on the horizon. This is a great way to continue engagement and provide students with further opportunities to educate themselves. If possible, extend an invitation to tour your facility for the class in the future.

   c. If you did not use an online virtual tour, leave the teacher of the class with the link to www.manufactureyourfuture.com and encourage them to further explore manufacturing online.

   d. Be sure to thank whomever arranged your classroom visit.
INTERACTIVE CLASSROOM ACTIVITIES

FOR K-5

Shop Floor Safety True or False: With our youngest audience, consider using a virtual facility tour video and following it up with a basic safety true or false quiz. These should be simple questions that help students understand safety protocol in the manufacturing facility. Walk through the questions as a group with younger students or do it as a quiz for older students and talk through the answers. Give examples from your own facility about why safety is important and how it can alter day-to-day operations.

SHOP FLOOR SAFETY TEST

Circle true or false (T or F) in response to the following questions on safety:

1. Wear safety glasses only when operating machinery. T F
2. Report all injuries, no matter how minor, to your instructor. T F
3. Wear proper safety shoes whenever on the shop floor. T F
4. When operating a machine, it is sometimes necessary to sit in order to avoid getting tired. T F
5. Talking to others while operating a machine is not dangerous. T F
6. All shirt sleeves must be rolled up above the elbow. T F
7. Do not run or fool around in the shop area. T F
8. All jewelry must be removed before operating machines, including rings and bracelets. T F
9. When you start to operate a machine you haven’t been instructed on, play with the controls first to see how it works. T F
10. It’s okay to wear loose, baggy clothing as long as it is tucked in a bit. T F
11. Do not operate a machine without instruction or permission. T F
12. Once instructed on how to use a machine safely, you may remove your safety glasses. T F

Manufacturing Mr. Potato Head: At times, familiarity can help bring a situation to life. When speaking to a young audience, the Manufacturing Mr. Potato Head can be a great activity to help simulate a manufacturing process with a fun final product. Depending on the class size, bring several Mr. Potato Heads to the classroom you are visiting and disassemble them so that body parts are placed in separate piles. Then provide students (individual or small groups depending on the class size) with the body of Mr. Potato Head and ask them to work together to finish manufacturing the rest of the toy. Use the activity as an opportunity for discussion and talk about other items that have been manufactured. If time permits, you can put additional twists on the activity such as requiring teams to trade parts to complete their toy.

FOR 6TH – 8TH GRADE

Tallest Tower: Students are asked to manufacture a tower using just the items available within a bag provided to them. Have students unpack their materials and give them some time to plan their tower. During this time, they may touch and examine their materials, but they may not start building. They should sketch plans and discuss strategies. Once building starts, if they destroy a material, it cannot be replaced.

Give students some time to build a tower. They may modify their plans at any time. Make a rule change as a plot twist. One possibility is to tell students they can now trade materials with other groups if both groups agree. Another is to give out more materials (the same or different) to the groups (sought-after ones include adhesives – tape and glue – and scissors). Yet another rule change is to say they must use all of their materials in their towers. Give time warnings so that students can plan accordingly. The materials should be as simple as items found around your office. Some examples of materials include:

Bag #1
A Few Feet of Electrical Tape (wound around a pen or craft stick)
3 Manila File Folders
5 Paper Clips
2 Sheets of Construction Paper
INTERACTIVE CLASSROOM ACTIVITIES CONT.

Bag #2
A 12” Strip of Masking Tape (wound around a pen or craft stick)
5 Paper Cups
5 Craft Sticks
8 Mailing Envelopes
4 Straws

Bag #3
2 Small Pieces of Cardboard
10 Craft Sticks
4 Sheets of Aluminum foil
A Pad of Sticky Notes
Several Feet of String
1 Large Plastic Cup

This activity helps to demonstrate the different skills required to work in manufacturing including planning, strategizing, team work, and execution. The team that can build the most sustainable tower, not just the highest, wins this activity. As a prize, consider giving a certificate for the activity (see Branding chapter).

REAL WORLD SIMULATOR: This activity takes a bit more preparation but can help students understand the value of their paycheck and why manufacturing can be so helpful to their future. Take a group of plain envelopes and write different careers on the front. The careers should be specific to manufacturing but overall general (machinist, welder, industrial maintenance technician). It would be even better to have these careers parallel opportunities available in your region. Then place the average monthly salary in each of the envelopes in play currency. Before beginning the activity with the students, come up with four or five basic expenses people experience on a monthly basis (rent, car, food, electricity, cable are some examples) and put an amount associated with each up in front of the class.

Distribute the envelopes to the students and ask them to assume the career they have been given. Walk them through each expense and ask them to hand over the amount they owe. Once all expenses are accounted for ask them to count what they have remaining and then articulate that careers in manufacturing would leave them with disposable income. At this point, open the discussion to the class and ask what they would do with that type of additional income. If time permits, do the activity again but have the students receive a promotion because of their years on the job or because of additional education received. Complete the same practice going through expenses and end with discussion again.

HIGH SCHOOL

Fact or Myth Quiz: This activity works with students of all ages, but can be especially impactful when talking to students who are more familiar with career paths. The Fact or Myth quiz takes common misconceptions or truths about manufacturing and asks students to make their own determination on each statement. This activity can be especially impactful before you do a presentation about manufacturing careers for the students. It can help spark interest and have students better understand why the information being provided to them is important. These quizzes can easily be developed but the template below is a great place to start.
**Title:** Squishy Circuits: A GLOBALFOUNDRIES TechTuesday Activity

**Target Audience:** Students, Educators

**Synopsis:** “Squishy Circuits” is a fun way to learn about how electricity flows from negative to positive. In this lesson, students will gain a general understanding of how a circuit works and the concepts of a diode. After the students learn about the properties of their materials, they will design a creative circuit that blends both science and the arts.

**Required Planning Time:** < 1 Week

**IMPLEMENTATION PROCESS:**

1. **Required Materials (Per group)**
   The required materials needed for the Squishy Circuits activity are as follows:
   a. 2 Cans modeling clay
   b. 1 9-Volt Battery
   c. 2 LEDs
   d. 1 9-Volt Battery Lead Attachment
   e. Modeling Clay

2. **Materials Cost (Plan based on 20 Students per class, 4 Students in a group)**
   a. $5.00 – 10 Cans of Play-Doh (Walmart / Target)
   b. $14.00 – Energizer Max 9V Battery 5 Pack (Walmart)
   c. $8.32 – 20 9V Battery Wire Leads (Walmart)
   d. $8.18 Modeling Clay, 5LBs (Walmart)
   e. $10.00 – LEDs Radio Shack

3. **Step-By-Step Instructions**
   a. Roll Play-Doh into two reasonably thick strands
   b. Connect 1st strand to the lead of the 9-Volt battery
   c. Connect 2nd strand to the remaining lead on the battery (Do NOT let the Play-Doh Strands touch)

4. **Lesson 1 – Diodes**
   a. Using an LED, connect the two strands
   b. Q1. Did the LED Light Up? YES or NO
   c. If the LED did NOT light up, try reconnecting the LED backwards
   d. Q2. Did the LED light up this time? Yes or No
   e. Q3. Why? (Ask a volunteer)

5. **Lesson 2 – Short Circuits**
   a. Connect the two strands of Play-Doh together using more Play-Doh, in between the Battery and the LED
   b. Q4. Did the LED go out? Why? (Ask a volunteer)

6. **Lesson 3 – Series vs. Parallel Circuits**
   a. In your existing circuit, add another LED.
   b. Q5. Is the new LED as bright as the first LED in the circuit?
   c. Place a separate ball of Play-Doh just in front of the two original strands
   d. Remove the LEDs
   e. Pick one LED and connect one leg to the ball and the other leg to one of the strands
   f. Connect the other LED to the ball and the empty strand
   g. Reminder: Remember Lesson 1: Try turning the LEDs around if they do not light at first
   h. Q6. Are the LEDs as bright as your first circuit?
   i. Q7. Name a few properties of Series and Parallel Circuits? (Ask a volunteer)

7. **Lesson 4 – Conductors & Insulators (Project)**
   a. The modeling clay is an insulator (it does not conduct electricity well). Use this to separate the Play-Doh and design a creative Play-Doh / modeling clay piece that is also a circuit.
   b. Present your project to the group. The best project gets a prize!

8. **Learning Takeaway**
   a. Deeper understanding of electricity flow in a circuit
   b. Concept of a diode
   c. Conductors vs. insulators
   d. Short circuits vs. open circuits

9. **How is this related to the semiconductor industry?**
   a. Semiconductor manufacturing companies design complex circuits using chemical and physical processes that become the hardware for today’s most innovative consumer electronics products and software. This hands-on activity is a lesson in simple circuits. It’s an introduction to the world of electronic hardware that will jumpstart the student’s imaginations and further their understanding of how the day-to-day electronics they use actually work.
SQUISHY CIRCUITS CONTINUED

Set Up

Lesson 1: Diodes & Conductors

Lesson 2: Shorts

Lesson 3: Parallel

Lesson 4: Series

Lesson 5: Insulators
WHAT CAN YOUR COMPANY DO?
Title: Facility Tour

Target Audience: Students (all ages), Parents, Educators

Synopsis: Facility tours are an avenue for manufacturers to open their doors and demonstrate what modern manufacturing is all about. There is no better place than an actual facility to dispel outdated myths and inspire the next generation of manufacturing talent.

Facility tours help provide community members, students, parents, and educators with an opportunity to view a modern manufacturing environment first hand. For many, it is the first time they have had an opportunity to visit a manufacturing facility. These tours allow people from all walks of life to see for themselves that the industry is alive and well in our country. Follow these guidelines for a strong facility tour:

Required Planning Time: 3 months

IMPLEMENTATION PROCESS:

1. Organizing Your Facility Tour
   a. Determine the format of your event, length of event, and audience for event.
   b. Options include facility tours, classroom presentations (see page 10), and roundtable discussions.
   c. Register your event on www.mfgday.com. This will serve as a public-facing profile for your event where you can inform invitees on vital information.
   d. Draft and send invitations to your desired audience. (See Communications chapter for sample invitations and steps for reaching out)
   e. Distribute memo of visit to employees making them aware of the visitors. This memo should include a protocol you wish to be in place during the event.

   For a more detailed plan, please visit the Manufacturing Day Host Toolkit.

2. Organizing a Facility Tour

   *Note: If you have previously held facility tours, skip to step 3.
   a. Put together an internal planning group to help aid with this process.
   b. Establish a welcome area within the facility and determine who will be greeting the attendees when they arrive. Make sure to have a welcome message crafted that represents your company.
   c. Determine a tour route through your facility. Be sure to note whether machinery will be operating and whether areas exist that are not for public view. Clearly articulate these facts at the beginning of the tour.
   d. Select employees to play the role of tour guides. If you are welcoming a student audience, younger employees will serve as a more relatable host and will achieve a greater impact.
   e. Craft a tour script that highlights the different functions of your company and of your manufacturing process.
   f. Decide whether photography will be allowed on the tour. Clearly articulate this decision at the beginning of the tour.
   g. Determine if you want to create a product display. Gather other company literature and display those materials in an appropriate location.
   h. Determine whether it is appropriate for there to be a media presence at your event. If so, draft a media advisory (See Communications chapter) and prepare a message from your company president.
3. Day Of Preparations

a. Make sure your facility is clean before attendees arrive. No clutter, everything in its place, floors swept clean, and a clear tour path through the shop.

b. Make sure employees are appropriately dressed and all roles are defined during the day. If possible, make sure employees are wearing a name badge so they can be addressed by name when answering questions.

c. Place required safety equipment in a location near the entrance. Make sure that those welcoming attendees or tour guides speak to safety protocol for all visitors.

d. Consider putting up a welcome sign to demonstrate your enthusiasm for having visitors to your facility. You can download a customizable sign from www.mfgday.com.

4. Conducting a Facility Tour

a. Welcome guests upon arrival.

b. When speaking to guests assume your visitors have very little knowledge about manufacturing. You should make sure to speak to:

- How did your company get started?
- What products does your company manufacture?
- Who are your customers?
- What do your products do?

c. Rather than starting your story with dry historical information, “ABC Company opened in 1922 and has operated out of three different locations,” hook visitors right at the start with an interesting anecdote. Talk directly to them. For example, “If you’ve ever been young and in love, you’ll be interested in how this company got started. Joe and Angela Johnson opened the doors back in 1922. He was 23, she was 19. They’d been married for two weeks, and this was their American Dream ...”

d. If you are hosting student visitors this is your opportunity to provide advice about the kinds of careers that your company offers and the type of training and educational coursework you seek when hiring employees.

e. Avoid jargon and know your audience. What language would you use? Avoid industry terms and business lingo that others don’t understand.

f. Let your visitors be active participants. If feasible, without shutting down production lines, offer your visitors the chance to address your entire workforce. Have guests do something “physical,” such as shake hands, run a machine, examine your product or look at a computer screen.

g. Utilize pre- and post-tour surveys to better understand the impact your event had on your participants.

h. If possible, send your visitors home with something tangible. Options include a widget, some materials, or a photograph. It will create a long-term reminder for those who attended your event.

5. Follow Up from Your Event

a. Send thank you notes to your guests and staff.


c. Use social media to promote any press coverage, photographs, and a recap of the event.

d. Solicit feedback from visitors and begin to prepare for an improved next event.
Making It Real: Girls & Manufacturing

Title: Making It Real: Girls & Manufacturing

Target Audience: Students and Educators

Synopsis: Making It Real: Girls & Manufacturing is a high-impact event (or series of smaller events) designed to expose middle and high school girls to dynamic, successful businesswomen and educators who are passionate about their careers and the contributions they make to our world. The program includes exhibits and displays, hands-on demonstrations, student and teachers workshops, and a unique “Women in Manufacturing” Roundtable.

“Making it Real” gives young girls and educators an opportunity to learn about today’s manufacturing workplace directly from women practitioners, and discover the skills needed to be successful in a manufacturing career. The program taps into today’s female manufacturing leaders to help inspire the next generation of leadership and talent, and spark girls’ interest in the world of manufacturing and the potential careers it offers.

Required Planning Time: < 1 Month

IMPLEMENTATION PROCESS:

1. Develop a program budget.
   a. Consider: Facilities, transportation costs, staffing and food costs; collateral materials and activity supplies; and honoraria for keynote speakers.

2. Identify a location to host your event and/or a program partner.
   a. Consider the requirements for: general session presentations, hands-on workshops, exhibit/demonstration space, and lunch. Other facilities logistics include: bus drop-off/pick-up/parking; registration and collateral/display space; special needs (accessibility and dietary); audio-visual requirements; food preparation and serving; and workshop set-up opportunities.

3. Select the program format and activities that fit your event.
   a. The main goal of Making it Real is to engage girls through first-hand exposure to role models and experiential opportunities. Include hands-on workshops, demonstrations, and multi-media presentations, keeping in mind content that will be of interest to young women. Provide access to both industry and education partners. An strong keynote address (of no more than 20 minutes) and an engaging roundtable discussion (see below) are critical elements. Create a collaborative, interactive environment. Highlight local talent. And make it relevant and authentic!

4. Develop your outreach campaign and create materials
   a. Develop your outreach campaign and create materials for recruitment of students, teachers, roundtable panel participants, and exhibitors. Materials should be gender-specific. Consider the number of participants you can accommodate based on space, planned activities, and staffing.

5. Confirm attendance and share event information with schools.
   a. Provide exhibitors and speakers with guidelines. Develop schedules and staffing needs. Finalize all logistics, including: transportation needs; registration; exhibitor requirements; schedules/flow; and workshop and collateral materials.

   a. Encourage students to visit exhibits and demonstrations. Distribute Dream It. Do It. resources and collateral. Provide a welcome and overview of the day, including expectations. Keep to a tight schedule and a fast pace. Ensure smooth transitions from activity to activity. Encourage participation and collaboration through a “safe” environment. Make girls and women important.

7. Post-program.
   a. Provide student/educator surveys to evaluate attitudinal changes. A sample survey is included in the program toolkit.
Women in Manufacturing Roundtable

The panel should include 4–5 women from both industry and education, so students can hear different perspectives ranging from skills needed to workplace challenges. The roundtable should be facilitated by a recognized moderator. Panelists can begin by sharing their “personal stories” in a 3-5 minute TED Talks format. Sample topics for panelists to consider include:

- When did you first think about a career related to manufacturing, and why?
- How did your parents or teachers react when you decided to pursue your education/career in manufacturing?
- Was there someone who inspired you? Did you have a role model or a mentor?
- What has been important to your success in your career?

The moderator can then open the floor for audience Q&A. If necessary, the following sample moderated questions may be used to encourage discussion:

- What were the most important courses you took in high school or college to prepare you to be successful in your career in manufacturing? (Industry)
- What do you think are the most important things students should do to prepare for a career in manufacturing? (Academia)
- What are your professional goals? What do you hope to achieve?
- What do you think are the greatest challenges—either something you’ve experienced personally or that you are aware of—women entering a career in manufacturing will face?

THE “MAKING IT REAL: GIRLS & MANUFACTURING” STORY

Manufacturing is facing a serious skills gap, and the underrepresentation of women in the industry is adding to that shortage. And unfortunately, national graduation rates show that men outnumber women in nearly every STEM field. In some fields, such as engineering, the difference is dramatic, with women earning only 20% of bachelor’s degrees.

The scarcity of women pursuing STEM careers—particularly in the manufacturing sector—is due to a number of shortcomings: the failure to design and implement programs that will attract girls to participate; the inability to communicate information about educational and career pathways in a way that will generate interest among young girls; the lack of female role models; and the scarcity of experiential opportunities that showcase future opportunities.

“Making it Real” directly addresses these challenges. The full-day summit introduces girls to manufacturing through team-based activities that replicate the manufacturing process from concept to design to fabrication to quality control. Students have a chance to learn first-hand from manufacturers about rapid advances in manufacturing technologies and future career opportunities. Educators can attend a workshop focused on strategies to inspire interest among girls in STEM-related careers such as manufacturing and best practices for incorporating female role models in the classroom, featuring a collaborative discussion that includes the afternoon’s roundtable panelists.

“Despite the resurgence of manufacturing in the U.S., women continue to be significantly underrepresented in the industry,” said Susan Palisano, Connecticut. Dream It. Do It.’s director. “Young women today not only want a great job but a meaningful career, and sparking interest in manufacturing among girls is a priority to assure that the industry can attract, retain and advance women in skilled positions and as future leaders.”
Making it Real: Girls & Manufacturing has two clear mandates: (1) to change the perception of the role of women in manufacturing through positive role models, and (2) to increase the number of girls entering the STEM pipeline. Activities focus on raising awareness of manufacturing-related careers and their skill requirements, workplaces, and educational and career pathways; improving attitudes toward manufacturing; and increasing girls’ confidence in their ability to be successful in STEM-related courses and manufacturing careers. The Summit format includes:

- Pre-program table displays, interactive demonstrations, and networking opportunities
- VIP presentations
- Student hands-on workshops and concurrent educator workshop
- Luncheon and keynote address
- Multimedia presentations
- “Women in Manufacturing” Roundtable
- Optional industry/training site tours

After attending Connecticut’s Making it Real: Girls & Manufacturing Summit, 80% of students surveyed reported that they were interested in a manufacturing career, 81% wanted to learn more about manufacturing, and 98% found the experience a positive one. The data also showed an increased interest in taking manufacturing-related courses, as well as increased knowledge of the skills it takes to be successful in manufacturing careers. Open-ended responses were both positive and particularly enlightening as to the impact of strong female role models. Both teachers and students commented that hearing from female industry leaders was extremely valuable. One student remarked that “it was more important to hear from women who were higher up in their company,” while a teacher commented that the “highlight of the event was the keynote speaker; she could really relate to and engage the students to learn more about careers in manufacturing.” Teachers also recognized the value of the experiential opportunities the summit offers, acknowledging the importance of engaging student activities that foster collaboration and project-building skills, noting that all students were actively “thinking and doing.”

Finally, one teacher summed up the impact of both the student and educator experiences: “Our students enjoyed the hands-on activities provided at this workshop. Most of the attending students would consider a career in manufacturing as a result of attending the summit. In the educator’s workshop, the panel of speakers was very knowledgeable, informative, and dedicated to their chosen careers. I feel we as educators are better equipped to promote careers in the manufacturing industry to our female students.”

The Making it Real: Girls & Manufacturing has been a full-capacity Connecticut Dream It. Do It. event in both 2014 and 2015, with almost 300 middle and high school girls attending and many more turned away. One of our female Student Ambassadors who is currently in a Tech High School manufacturing program best articulated the opportunity programs like Making it Real offer girls: “What I knew of the manufacturing field was that it was historically male dominated, and I didn’t know if there was a place for young females. As I start to think of my future, I’m excited to watch the regrowth of manufacturing in Connecticut. It is also exciting to see the increased role that women are playing.”
MANUFACTURERS IN ACTION
Honda’s Women in Engineering Network’s (WIN) goals are to accelerate the advancement of members by establishing a network to foster professional development, create unique professional development opportunities, and promote a diverse voice in new model developments. Honda’s WIN focuses on empowering women engineers because they are a minority in the engineering world.

ENGAGE
There is a shortage of women in the manufacturing industry. For Honda, this gender gap is most obvious in their engineers. To help combat this issue, WIN participates in targeted recruiting through groups such as the Society of Women Engineers (SWE). Volunteers from WIN attend national SWE conferences, job fairs, and attend local college events to help recruit the next generation of women engineers. “We understand the importance of supporting recruitment so candidates can meet and get to know current associates, including female role models. … It’s important to meet someone candidates can relate to,” said Kristina Kennedy, Senior Quality Engineer, and founder of Honda R&D’s Women In Engineering Network.

MENTOR
Being a part of WIN means being able to provide a unique perspective on future product and technology value, making sure Honda’s products appeal to a diverse audience. It serves as a network for mentees to seek counsel from and is an organization that helps Honda R&D associates be successful in their careers. WIN is growing women in the company to prepare them to fulfill leadership positions.

“These women are a part of something special and a part of a group that has a vested interest in their success through mentoring, networking, and professional development opportunities. Although it’s small right now, we’re having great impact. Just by developing these relationships, it’s effectively making us smarter. We have go-to people in departments we didn’t know about before. We have better communication, and knowledge is power,” Kennedy said.

PROMOTE
WIN not only facilitates connections within Honda’s R&D entity, it also serves the community through focused outreach efforts. A major focus is its volunteer effort on K-12 STEM outreach with local schools. The network collaborated with a local middle school on the recent “STEM to Bloom,” a signature outreach event to encourage girls to consider a future career in the automotive industry. About 15 WIN volunteers served as role models for the day-long event, led the girls in hands-on activities, and provided a number of engaging “show and tell” items to help teach the girls about engineering. In addition, WIN provides teams, on behalf of the company, to serve local United Way Volunteer Days, and WIN has put together teams to support local Habitat for Humanity build events.

RESULTS
INCREASED WOMEN ON DEVELOPMENT TEAMS
WIN has helped increase the participation of women on next-generation automobile product development teams, and as a result the latest development teams are comprised of more women than ever before in the history of Honda R&D in the U.S.

DEVELOPMENT OF WOMEN SPECIFIC PRODUCTS
Honda R&D has women working on new concepts — by women, for women — with WIN and the encouragement of Honda leadership.

INCREASED RETENTION
Since WIN’s inception, Honda R&D has increased retention of women engineers.

The WIN organization at Honda R&D Americas has about 90 members; however, many of its events are open to non-members, which further increases its impact. A new associate joining Honda R&D said, “One of the things I was most looking forward to when I joined Honda R&D Americas was joining WIN.”

“I DON’T THINK YOU CAN FIX THE PROBLEM OF NOT ENOUGH WOMEN IN MANUFACTURING WITH POLICIES. IT HAS TO BE THE PEOPLE OF THE COMPANY THAT WANT TO PUSH THE AGENDA FORWARD.”

-Kristina Kennedy, Senior Engineer & Leader of WIN, Honda R&D Americas, Inc.
Women in Manufacturing (WiM)™ is the only national trade association dedicated to year-round support for women who have chosen a career in the manufacturing sector. By providing women with programming at local chapter events and national gatherings as well as online, WiM serves to promote and inspire women and help them excel in the manufacturing industry. With over 600 members, representing more than 350 companies, as well corporate membership from 13 industry-leading organizations, WiM is making a positive impact at the local and national level.

To ensure skilled and talented women stay and thrive in the industry, WiM offers its members a variety of resources including bimonthly webinars, its quarterly IMPACT newsletter, and access to special events and endless networking opportunities. WiM is also working to change the perception of manufacturing by providing its WiM SUMMIT, Women in Automotive Conference, and other local events through its current 14 local community chapters.

“At WiM, providing consistently great content is important to us,” says WiM President Allison Grealis. “That’s why we offer everything from information on the latest industry trends to tips for workplace confidence. But we’ve found that one of the best resources we can provide for women is each other. Through our networking opportunities, women can make the connections they need to grow their careers.”

ADVOCATE

At present, there are 14 community chapters across the U.S., and they span all the way from California to Connecticut. Community chapters provide local women access to best practices, plant tours, roundtables, and more. A recently formed WiM chapter in Kentucky provided a plant tour for students from nearby school districts to share with them what a career in manufacturing looks like. “That’s one of the great benefits,” said Grealis. “WiM serves as a vehicle for women that want to give back and want to participate in growing this next generation of manufacturing.”

RESULTS

INSPIRING WOMEN OF THE NEXT GENERATION

Almost every woman who becomes a member of WiM is interested in becoming a mentor or mentee through WiM’s mentorship program. Participants help each other advance in their careers by giving professional advice and assisting in networking efforts.

“WHEN A MAJORITY OF OUR MEMBERS STARTED THEIR CAREERS, IT WAS NOT UNCOMMON FOR THEM TO BE THE ONLY WOMAN AT THEIR PLACE OF WORK. OUR GOAL IS TO PROVIDE THEM WITH A DIRECT NETWORK OF WOMEN WHO SHARE THEIR SAME INTERESTS AND PASSIONS.”

- Allison Grealis, President, Women in Manufacturing

Whether in-person or online, WiM wants women to learn from each other. One of WiM’s most popular resources is the “Hear Her Story” blog series, which highlights women in the industry and allows them to share their manufacturing career stories with readers. The profiled women serve as examples of success in manufacturing careers and inspiration to the next generation.

PROVIDING A NETWORK OF SUPPORT

WiM is not only a critical support system and inspirational organization, it is also a way for companies to find and hire diverse talent. WiMWorKs was launched in 2012 to help be a vehicle for companies of all sizes to find diverse talent. WiMWorKs allows members and companies to find the best manufacturing jobs and opportunities in one place. “Manufacturing is facing a serious skills gap. We’re hoping to help close that gap by connecting talented women with real job opportunities,” Grealis says. “We’re also showing women who are not yet in the industry that manufacturing is an excellent career choice.”

Photos Courtesy of WiM
The mission of AWN is to be a catalyst for the advancement of women and Arconic through recruitment, development, and retention. The network has a multi-tiered structure, with a main Corporate Steering Committee and a series of 35-40 local networks that function globally. While all AWN networks align their goals to the main mission, each local chapter is encouraged to have its own set of goals specific for their needs and location.

**COMMUNITY ENGAGEMENT**

With the partnership of Arconic Foundation and AWN, The Manufacturing Institute hosted a STEP (Science, Technology, Engineering, and Production) Forward networking series across the U.S. developed to provide women in manufacturing an opportunity to hear from other women industry leaders. The series brought high-potential women together with speakers considered to be role models and allowed for participants to connect and discuss strategies on advancing and retaining female talent.

**STRONG SPONSORSHIP**

AWN works to increase engagement and sponsorship for women across the company. The network offers developmental activities for women through a variety of channels including online media, webinars, speaking engagements, and visits that foster opportunities for increased development for women. AWN highlights women’s stories on a regular basis through its internal and external networks. There have been numerous women recognized for a variety of accomplishments, from being Chief Information Officer to being recognized in the Top 100 women for the automotive segment.

AWN not only promotes its women workers internally, it also works to serve the community. “In our local chapters, there is a tremendous connection with the community and community involvement. We participate in everything from STEM programs, where we do readings at schools, to food drives, to doing ‘return to work’ programs for women that are coming back to work after having children,” said Leslie Shuman, Director of Operations Readiness. AWN includes close to 2,000 women who are actively participating globally.

AWN also contributes to Arconic’s toolkits that include teaching materials for local networks to be able to have off-the-shelf programming that they can do anytime, anywhere. “Someone can stand up and have a good conversation about providing performance feedback, about building confidence… Our developmental subcommittee really helps make sure we’re getting tools and ideas out there for development programs,” Shuman said.

**RECRUITMENT**

Every AWN chapter has a partnership with its local community college to help foster recruitment. “We make sure we have fresh materials and handouts for students that we’re looking at so that they know we have an employee resource group aimed for the promotion and development of women.” Students can see they have a path forward for a career in manufacturing with Arconic. For the last two years, AWN has also hosted one central recruitment event that has been lined up with the Society of Women Engineers’ annual conference.

**RESULTS**

**DIVERSE LEADERSHIP**

“AWN PROVIDES A FORUM FOR ALL WOMEN IN ARCONIC TO CONNECT, TO LEARN, AND TO GROW PROFESSIONALLY.”

- Leslie Shuman, Director of Operations Readiness

Arconic’s overall representation numbers have twice the number of women in management and leadership positions compared to other metals companies.

In 2012, Arconic was recognized by Catalyst specifically for its commitment to developing women in the manufacturing sector.

**INCREASED RETENTION**

Through an annual Employee Engagement Survey, Arconic found that women have a higher level of engagement than men at the company. By focusing on higher engagement within the company, Arconic hopes this improves retention as well.
The mission of Jabil Joules is to educate, mentor, and encourage networking and dialogue about diversity. Jabil Joules is all about starting the conversation.

Jabil is a U.S.-based global manufacturing services company, headquartered in St. Petersburg, FL. Given Jabil has 90 sites located in 30 countries across the globe, the company has a natural diversity to its business, with a very large female workforce. Jabil wants to improve its female diversity at the management level. Jabil Joules was put together to champion the business benefits of gender balance, to challenge organization barriers, and expand the representation of women in leadership and operations positions in manufacturing.

“For a long time people just assumed diversity would take care of itself, and I don’t think that’s the case. I think we have to be intentional about thinking about it.”

- Beth Walters, Senior Vice President Communications & Investor Relations, Jabil

ADVOCATE

Being a part of Jabil Joules means taking an active role in talking, strategizing, and planning about the role of women in all functional areas in manufacturing. It means being mindful of diversity in the workplace.

Jabil Joules started a blog around topics of interest to women in the manufacturing world, with many posts authored by female leaders or highlighting female leaders, and organized around education, mentoring, and networking. With a dispersed workforce, the blog allowed Jabil women to connect and converse from all around the world. As a direct result of the conversation from the blog, Jabil Joules created “Power Hours,” where guest speakers discuss their career path and how they got to where they are today. The presentations are recorded and posted to the blog to share across the company. “We heard from a lot of females that they wanted to hear from successful females and males in manufacturing to give them pointers and tips, they’re looking for guidance,” said Beth Walters, Senior Vice President Communications & Investor Relations, Jabil.

Every female at Jabil is considered to be a part of the Jabil Joules community. Each site has a Jabil Joules ambassador, who is responsible for gathering the females in their workplace on a regular basis to organize activities and share best practices. Executive leadership and male and female representatives are involved in the network, with steering committees in Europe, Asia, and America. These steering committees meet on a monthly basis to share best practices to see what is going on at other sites and what challenges others are having with diversity. “I think it’s really important that it’s not exclusively female, because this is about diversity and to do that you have to have intentionality across the organization to understand and appreciate the benefits of a diverse team,” Walters said.

MAKING A NATIONAL HONOR A LOCAL NETWORK

As a previous STEP Ahead Honoree, Walters has worked to reassemble Jabil Joules’ efforts after becoming aware and participating in the STEP Ahead program. She was extremely inspired by the STEP Ahead profile book, a collection of STEP Honorees’ and Emerging Leaders’ career paths and manufacturing stories. As a result, Jabil is putting together a Jabil Joules profile book, which will be a collection of females that are doing great work within their site to share with those looking to increase diversity on their teams. “We have people who are talented right here under our nose that some might not be aware of because of where they sit or what teams they’re exposed to. Sometimes it’s out of sight, out of mind. You don’t necessarily think about it, but once it’s there, a lot of men are very excited about it and very supportive of the women in the company,” Walters said.

RESULTS

INCREASING FEMALE APPLICANTS

Georigina (Ginna) de Loza, a winner of Jabil’s global continuous improvement competition was recognized for her female empowerment program at its Guadalajara site. The program increased the number of female applicants from 19% to 26% from its first fiscal quarter in 2015 to its third fiscal quarter in 2015. De Loza joined the corporate communications team in November and is now responsible for Jabil Joules sites in the Americas.

STARTING THE CONVERSATION

In August, Jabil’s European branch started conversations about increasing female leadership. Since these meetings began, they have hired 17 new female leaders across the spectrum from business unit, to lean manager, to quality technician. “This is just happening by being intentional, and we’ve already seen some great progress. We’re always going to choose the best candidates, but being mindful, making sure we have female candidates as well,” Walters said.
EDUCATIONAL PARTNERSHIPS
Title: Building Relationships with Educators

Target Audience: Educators

Synopsis: As a manufacturer, you have a unique perspective to offer educators and their students. But figuring out how to build a relationship, and what you want to say, can be challenging.

It all starts with understanding teachers — their unique practices, attitudes, and needs. Just like building customer relationships, it takes time to build a relationship with an educator, but doing so can help make engagement all the more satisfying, and help your message resonate with young women who are the next generation of workers.

It is proven that when manufacturers establish a lasting school relationship, students have more positive attitudes about our industry and also begin to consider a manufacturing career.

Required Planning Time: <1 Month

IMPLEMENTATION PROCESS:

1. Consider Your Goals
   a. Depending on the age range of your audience, there are varying factors to consider. Although reaching a younger audience may increase the opportunity to influence girls and boys about career options and taking technical education classes, high school partners can be a great source for interns and other more immediate connections with your company.

2. Define What Your Company Has to Offer
   a. Begin by defining the value your company can bring to a school program, classroom, or club. Some things to consider include:

   - Who in your company will be responsible for student engagement? How much time will they allocate for these activities? Will they be able to take time during the working day to participate in these activities?
   - Can your facility accommodate activities, tours, or events? If so, how many students? What age group are you comfortable bringing into your facilities? (See page 24 for Facility Tours)
3. Build a Relationship
   a. Begin by setting up a meeting with the appropriate contact at the school. (You can start with the samples in the Communications Chapter of this Ambassadors Kit.)
   b. Customize your communications to match what you can offer and what you know about your prospective education partner. It may be helpful to place the communication on company letterhead if sending via snail mail.
   c. If possible, have the communication come from an executive within your facility or organization. This will demonstrate the legitimacy of your requests and establish that student engagement is a priority of your organization.
   d. In many ways, sending these communications for the first time is like making a cold call. You have to be sure you are reaching out to the correct contact at the school if a relationship is to be established. Consider the following guidelines when attempting to make a connection.

   • Make sure the schools are within your organizations’ footprint. The closer the schools, the more likely they will be able to participate in your activities. You can do much of this research online.
   • Avoid reaching out to the principal in your initial outreach, who is responsible for administrative activity occurring in the school. Your communication may become another to-do, so it is usually best to start elsewhere.
   • Teachers in STEM-related fields or technical education classes are often your best first contact. They are teaching related fields and welcome industry support for their students. Contact information can generally be located on the school’s website.
   • If reaching out to a community college, the best point of contact is usually the instructors themselves. They will either provide direct access to the classroom or point you in the direction of a dean or director who can help you from there.

   • Don’t know who the best contact might be? Consider reaching out to an individual in a school’s administrative offices and ask to be pointed in the right direction.

4. Initial Meeting
   a. Having an initial meeting to describe your interest and what you can offer can get your relationship off to the right start.
   b. Consider hosting an initial meeting at your facility. It will provide the individual with an opportunity to experience 21st-century manufacturing. For many, it may be their first time in a manufacturing facility. You may also start by paying a visit to the school first and then inviting interested educators to your facility as a follow-up.
   c. At the initial meeting, plan to discuss your intentions and how your suggested activities align with the objectives of the educators. Understand what their challenges are in promoting careers and how you might be able to help. Remember, these individuals spend the majority of their time with students and can speak to what is impactful and what is not.
   d. If you feel that this meeting was successful, discuss opportunities to engage the students. Reference the plan you created in Step 1.

5. Other Methods of Connection
   a. There are other methods for engaging with local educators that you can explore.

   • Does your local school district have an advisory council? Do they need members of industry to sit on the council? You can find this information through the district’s website.
   • Is there an active PTA chapter for your local schools? This information can also be found through the district’s website or by speaking with parents in your community.
   • You can begin engagement through school clubs like SkillsUSA or FIRST Robotics. These students have already been exposed but their directors, who are often instructors or teachers, can be helpful in guiding the process to reach other students. Understanding how you can support career and technical student organizations can be best learned by having a conversation with the director at your local school.
CALENDAR OF ACTIVITIES WITH STUDENTS

Click here to download this calendar.

February

Engineers Week
Help kids and adults discover engineering by visiting a classroom or afterschool group (page 18), bringing students to your workplace (page 24), or mentoring a group of students (page 16).

March

Women’s History Month
Celebrate Women’s History Month by creating an affinity group. If your company already has an affinity group, schedule weekly meetings and activities for women in your company to participate in. See examples from Alcoa and Jabil on pages 32 and 33.

March 8

International Women’s Day

August 18

Women’s Right to Vote Day
Celebrate this historic day (recognizing the passage of the 19th Amendment in 1920) by connecting with your local NGCP site (page 16), or schedule an event with your company’s affinity group.

October

National Manufacturing Day
Participate in National Manufacturing Day, the first Friday of every October, by hosting an event or facility tour. See page 24 for more detail, or visit MFGDAY.com.

June

School’s Out For Summer
Think about organizing a facility tour (page 24) for local summer camps. Does your company provide internship opportunities? If not, creating a summer internship would be a great starting point.

September

Back to School
Participate in some classroom visits to kick off back to school activities. See page 18 for detail on getting involved.
POWERPOINT TO STUDENTS

Manufacturing Careers In Washington D.C.

AGENDA
- Ice Breaker Activity
- What Do You Know?
- What’s Up With The Manufacturing Institute
- What Can You Do With Manufacturing?
- Get Up and Get Engaged
- How Can You Get Involved

WHAT CAN YOU DO WITH MANUFACTURING
Build What You Are Passionate About

Click here to download template.
**MAKING IT REAL FOR GIRLS**

@Insert Twitter Handle Here
#MFGWomen

**WHAT DO THESE MOVIES HAVE IN COMMON?**

"Iron Man 2"  
"G.I. Joe: Retaliation"  
"Skyfall"  
"The Bourne Legacy"  
"The Dark Knight Rises"

@insert twitter handle here  
#MFGWomen

**man·u·fac·ture** [man-yuh-fak-cher]

Manufacturing is a process that takes raw materials and turns them into useful products.

- People making a social contribution  
- Beneficial for society  
- Problem solvers of some of the challenges of our time

Changes the World  
Improves Life  
Serves People

@insert twitter handle here  
#MFGWomen

[Click here](#) to download the template.
Dear NAME,

As a [COUNSELOR, INSTRUCTOR, ADMINISTRATOR] in our community, [YOUR COMPANY] greatly appreciates the work that you do preparing students for their futures. As a manufacturer employing [NUMBER OF EMPLOYEES] in [REGION], we are equally dedicated to supporting the future of our local youth. We have recently become a part of The Manufacturing Institute’s Dream It. Do It. program that strives to excite local youth about careers in manufacturing, and we would like to become engaged with your students.

Option 1: We are requesting an opportunity to meet with you and discuss ways that we can support your students and provide them with valuable information about manufacturing careers. Manufacturing is the backbone of our nation and contributes nearly $2.08 trillion to the economy annually. As a result, we provide long lasting careers to our employees, and your students deserve to learn more about these opportunities.

Option 2: We are [DESCRIPTION OF ACTIVITY] and would value having your students participate so they can better understand what 21st century manufacturing is all about. Manufacturing is the backbone of our nation and contributes nearly $2.08 trillion to the economy annually. As a result, we provide long lasting careers to our employees, and your students deserve to learn more about these opportunities.

We are going to change the image of manufacturing in [COMMUNITY/STATE] and provide a platform that allows students to experience manufacturing as they begin to consider their future career path. If possible, I would like to schedule a phone call to discuss how your students can benefit from our efforts with Dream It. Do It. To learn more in the meantime, please visit [http://www.themanufacturinginstitute.org/Image/Dream-It-Do-It/Dream-It-Do-It.aspx](http://www.themanufacturinginstitute.org/Image/Dream-It-Do-It/Dream-It-Do-It.aspx).

I look forward to hearing from you and working together to positively impact our region’s students.

Sincerely,

NAME
SAMPLE MEETING AGENDA

[Click to select date]
[Time]
Type of Meeting: [YOUR COMPANY] Student Engagement with Dream It. Do It.

Invitees: [NAME OF INVITEES]

Greeting and Introductions

9:00 am: Understanding [YOUR COMPANY]
   1. Who We Are
   2. What We Do
   3. Our Student Engagement Objectives

9:40 am: Understanding [PARTNER SCHOOL]
   1. Student Objectives
   2. Career and Technical Education Opportunities for Students
   3. Opportunities for Industry Engagement

10:00 am: Dream It. Do It.
   1. Objectives of the Dream It. Do It. Program
   2. Introducing the Ambassadors Kit
   3. Activities for Student Participation

10:30 am: Next Steps
   1. Appropriate Step to Build the Relationship
   2. Opportunity for Educator Facility Tour
LIABILITY WAIVER

Tour Date | Time a.m.- Time p.m.

By completing and signing this form, both student and parent/guardian are aware of the following:

• Parents /guardians are welcome to attend, but it is not mandatory.
• Parent/guardian’s signature is required for student participation.
• Dress Code: NO open-toed, high-heel or sling-back shoes, skirts or shorts are allowed.
• Jeans and sneakers or comfortable shoes are recommended.

In consideration of being permitted to participate in a tour of [YOUR COMPANY], the undersigned releases, waives, discharges and covenants not to sue [YOUR COMPANY], its agents, managers, directors, officers and employees, all of whom for the purpose of this release are referred to as “releases,” from all liability to the undersigned and the undersigned’s parents/guardians, for any and all loss or damage on account of injury to the person or property of the undersigned, whether caused by the negligence of the releasees or otherwise, while the undersigned is in or upon the [YOUR COMPANY] premises.

The undersigned agrees to indemnify and hold the releasees harmless from any loss, liability, damage or cost they may incur due to the presence of the undersigned in or on the [YOUR COMPANY] premises and whether caused by the negligence of the releasees or otherwise.

The undersigned further agree that the foregoing release, waiver and indemnity agreement is intended to be as broad and inclusive as is permitted by the laws of the State of [YOUR STATE], and that if any portion of it is held invalid, it is agreed that the balance shall, notwithstanding, continue in full legal force and effect.

The undersigned assumes full responsibility for and risk of injury or damages while participating in the plant tour.

Student Name: ____________________________________________________________ Age: ____________________________
School: ___________________________________________________________________ Grade: __________________________
Phone Number: ____________________________________________________________ Email: __________________________
Parent/Guardian Name: _____________________________________________________
Phone Number: ____________________________________________________________ Email: __________________________
Parent/Guardian Attending? (yes or no) ______________________________________________________________________
Parent/Guardian Signature: __________________________________________________________________________________

Please fill out and return this form by [DATE] to [SCHOOL CONTACT] by email to [SCHOOL CONTACT EMAIL] or via mail to:
I do hereby give my permission to [COMPANY] and its successors or affiliates and its related parties (press, publishing companies etc.), to record _____________________________________________________________.

I also do hereby give my permission for the use of my image, voice and name for the purpose of this audio/video production. I understand that footage from the recording will be used in _____________________ internal and external media_____________________________.

I waive any right to inspect or approve the final audio/video recording as well as future uses or viewing. I understand and agree that I will receive no additional compensation in return for my participation or consent. This consent is irrevocable, worldwide and perpetual. I release [COMPANY] from any and all claims and demands arising out of or in connection with the use of the audio/video recording including, but not limited to, any claims for any form of defamation, copyright or trademark infringement, invasion of privacy, or violation of the right of publicity.

________________________
Employee Signature

________________________
Employee Name

________________________
Date of Signature
MEASURING SUCCESS

Deloitte Post-Event Survey
When implementing the activities found within this toolkit, it can help to receive real-time feedback from participating students. In partnership with Deloitte, The Manufacturing Institute has developed an online survey device that will allow ambassadors to record student, educator, or parent/guardian perception of manufacturing after engagement. This data will provide each ambassador with a method for tracking success as well as contributing to a national report on the impact of engagement. To utilize the survey, please complete the following steps.

1. Click here to register your ambassador program.
2. Ambassadors should decide on how the target audience will complete the survey. If working with a student population, this is best discussed with the appropriate educator. It is best to notify the group before engagement that you intend to survey the participants at the end of the activity. Options to complete the survey include:
   a. Provide a computer or tablet at the completion of your activity that is pre-set to the survey device. www.mfgday.com/survey
   b. Provide a link to the survey device to the target audience and ask that the survey is completed on their own time. www.mfgday.com/survey
3. Participants will be asked to complete the following steps:
   a. Agree to terms
   b. Identify as a student, educator, parent/guardian, or employer
      • If the individual is a student, they will be prompted to enter their year of birth. Students under the age of 13 are ineligible to complete the survey. To survey those students, please see the paper/pencil survey below.
   c. Identify their agreement or disagreement with eight questions related to the activity they engaged in
   d. Describe their familiarity level with manufacturing prior to the event
   e. Identify their gender
   f. Identify country of event
   g. Identify state of event
   h. Identify applicable Ambassador program
   i. Identify current education level
   j. Submit the survey
4. After 50 participants have completed the survey, you will receive a Deloitte generated report that speaks to the impact your engagement had over participant perception. To request a report contact institute@nam.org. Please allow 4 weeks to receive your report.

*Students under the age of 13 are ineligible to complete the Deloitte survey device. To survey those students, please see the paper/pencil survey below.
MARKETING MATERIALS
The Brand:
Posters

From nanotechnology to robotics, innovative ideas happen every single day. But who transforms these raw ideas into the must-have products that improve the lives of everyone around us?

With a career in manufacturing, YOU WILL.

Ideas that MOVE US.

Ideas that MOVE US.

Jill of All Trades

Women change the world in advanced manufacturing. Learn more about manufacturing careers at dreamitdoit.com.

Saving lives. Flying planes. Rocking music. All in a day's work.

Women are leaders in manufacturing and you can make a difference too.

Learn more about manufacturing careers at dreamitdoit.com.
The Brand:
Social media graphics

Manufacturing workers earn $78,000 in average compensation.

Manufacturers Perform 65% of all private sector research.

WHAT DO WOMEN IN MANUFACTURING SAY?

- Opportunities for challenging and interesting assignments, attractive pay, and work-life balance are most important to women in their careers.
- Women in manufacturing want flexible work practices, mentorship programs, and to improve the visibility of key leaders who serve as role models.
- 66% of women would encourage a daughter or female family member to pursue a career in manufacturing.

WOMEN REPRESENT A VAST TALENT POOL

- While women represent 47% of the total U.S. labor force, they comprise 21% of the manufacturing workforce.
- Fortune 500 companies with high percentages of women officers hold 7.6% higher return on equity and 33% higher return than companies with fewer women executives.
- More than 70% of women indicate they would stay in manufacturing if they were to start their career today.
YOU ARE THE FUTURE.

MANUFACTURING IS ABOUT CREATING PRODUCTS THAT AFFECT EVERYONE’S DAILY LIVES AND EVEN CHANGE THE WORLD.

themanufacturinginstitute.org
The Brand:
Infographic

#MFGWOMEN THROUGH TIME

1809
Mary Dixon Kies
Mary Dixon Kies receives the first U.S. patent issued to a woman. Kies invented a process for weaving straw with silk or thread.

1903
Mary Anderson
Mary Anderson invents the windshield wiper and is granted a patent for the invention in 1903.

1906
E. Lillian Todd
E. Lillian Todd is the first woman to design and build an aircraft.

1908
Melitta Bentz
Melitta Bentz receives a patent for the coffee filter system.

1916
Rosie Farrar
Rosie Farrar becomes the first female employee at Boeing. She sewed the fabric on the company’s first airplane.

1940
Beulah Louise Henry
Beulah Louise Henry invents the first bobbin-free lockstitch sewing machine. Henry was known as “the lady Edison” for the many inventions she patented.

1942
Hedy Lamarr
Hedy Lamarr invents a remote-controlled communications system for the U.S. military during World War II. Lamarr’s frequency hopping theory now serves as a basis for modern communication technology, such as Bluetooth and Wi-Fi network connections.

1955
Beatrice Alice Hicks
Beatrice Hicks designs and patents a gas density switch later used in the U.S. space program.

1971
Wally Funk
Wally Funk becomes the first female FAA inspector and one of the first air safety investigators.

1995
Eileen Collins
Eileen Collins is the first woman to pilot a space shuttle.

2012
Launch of STEP
The Manufacturing Institute launches the STEP Ahead initiative.

2013
Mary Barra
General Motors names Mary Barra CEO, making her the first woman to run a major U.S. automaker.

Download [here](#).
Counselors across the nation are one of the greatest influencers of student pathways. They have an intimate knowledge of their student’s abilities and must present options that will allow them to thrive.

However, not every student’s path is meant to have a four year university or college as its end destination. For many, post-secondary and career preparation success can begin with soft skills, the ability to work well with others, and the passion to learn more. Manufacturing opportunities abound, and students deserve to know about those pathways.

If this brochure doesn’t make you confident in manufacturing careers, have a conversation with a local manufacturer. Tell them the action steps suggested in this brochure and hear their response. They will validate the need for your students to have an opportunity to thrive professionally and succeed quickly in manufacturing. It is your responsibility to educate your students of these opportunities and let them know that employers want their talent.

IT’S A WHOLE NEW PATHWAY.
Preparing for a career in manufacturing is nothing like generations past. Training is now easily accessible, costs are affordable, and skills that are readily acquired directly align with the advanced manufacturing competency model. High school, college, and technical programs will provide students with the technical training they need to succeed in the modern manufacturing industry. Technical pathways can be achieved at a community college or technical college for a quarter of the costs of a four year university or college. Students should explore all educational options that will allow them to thrive.

Manufacturers on average provide the highest compensation to employees than any other industry across the country. At an average of $35,30 per hour or $77,000 worth of salary and benefits, the value of manufacturing employees are made clear by employers. If you work hard and are willing to learn, the money is there to be made.

GUIDING THEIR PATHWAYS
Counselor (noun): A trained adviser or mentor on academic and career readiness.

Manufacturing careers are in high demand…
In 2012, the average manufacturing worker in the United States earned $77,505 annually, including pay and benefits. The average worker in all industries earned $53,063.

The average entry-level CNC operator earns between $28,000 to $30,000 a year, with benefits and overtime available through many employers.

The average experienced CNC operator can earn more than $100,000 a year with benefits and overtime available through many employers.

EMPLOYERS ARE PAYING FOR QUALIFIED TALENT.

 Median pay for CNC machinist is close to $40,000 a year.

 Maintenance technician...$30,000

 Logistics analyst...$30,000

 Advanced-Business Manufacturing Technician...$35,000

 General Maintenance and Repair Worker...$30,000

TELL YOUR STUDENTS: THE BEST PAY COMES FROM MANUFACTURERS.

COUNSELOR (noun): A trained adviser or mentor on academic and career readiness.

Take Action Now
Guidance and career counselors can take the following steps to be proactive with this mission:

Get Educated:
• Understand the technical training opportunities available within your region and begin to provide this information simultaneously to four year opportunities.
• Explore industry certifications using the Developing Skilled Workers toolkit for educators and understand their value against common post-secondary degrees.
• Visit a local manufacturing facility to understand what modern manufacturing is all about.

Get Involved:
• Explore a Manufacturing Day activity for your students. Manufacturing Day events could include a visit to a local facility or a virtual manufacturing tour online, or a presentation from a local manufacturer. Learn more at www.mfgday.com or www.discoveryourfuture.com.
• Connect with your local Dream It. Do It. site and request a meeting to learn more about getting students involved with manufacturing in your region.
• Go Proactive:
• Connect with your local Dream It. Do It. site and request a meeting to learn more about getting students involved with manufacturing in your region.

Get Involved:
• Request literature from your local community or technical college and begin to provide this information simultaneously with four year options.

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Managers on average provide the highest compensation to employees than any other industry across the country. At an average of $35,30 per hour or $77,000, worth of salary and benefits, the value of manufacturing employees are made clear by employers. If you work hard and are willing to learn, the money is there to be made.

Tell your students: the best pay comes from manufacturers.
We need to let our doubts about manufacturing fall to the wayside. Our children are missing out on an opportunity that could put them on a pathway to success. There are hundreds of thousands of jobs available in manufacturing across the country and your child is in demand. Have a conversation with your son or daughter and introduce them to manufacturing.

Additional Resources:
- Visit www.mfgday.com and learn about manufacturing events and plant tours in your state.
- Check out www.usmanufacturingpipelines.com to take the career assessment and find the right path for you.
- Speak to your child’s guidance counselor and ask to learn more about manufacturing or connect them with your local Dream It. Do It. program.
- Enroll your student in a local SkillsUSA or FIRST Robotics Competition.
- Check out the Manufacturing Institute’s M-List to find a school where you can obtain manufacturing certifications.

Parents across the United States share a common theme of concerns. Will my child be successful as an adult? Will they be able to provide for themselves? Will they ever achieve independence?

A successful child is the ultimate goal of parenthood. We strive to help them achieve independence and an identity of their own. What many parents don’t understand is that this success, independence, and identity can all be attained through a career in manufacturing.

In terms of success, manufacturing careers truly provide the whole package. Manufacturing employers across the nation currently offer the highest salaries and benefits on average of any industry. There is incredible opportunity to grow within these organizations and climb the pay scale. And what is most exciting, the education to acquire the necessary skills for manufacturing careers come at a fraction of the cost and time required in most traditional post-secondary education.

There is an 8.9% salary premium for working in manufacturing compared to other industries.

Not every individual is destined for a four year academic institution after high school. These academic institutions offer great educational opportunities but often come at a steep cost premium and with a lot of debt. What’s even more concerning is that many students are not achieving employment upon graduating.

The stereotypes of manufacturing from a generation ago no longer represent the reality of today’s workforce. 21st century manufacturing is about clean, high tech, and fast-paced work environments. Employees work on some of the most advanced technologies that create the products that we use each and every day.

Manufacturing drives safety. Employers across the nation require compliance with OSHA standards and state and federal laws. Workplace safety is dramatically different than it was a generation ago and some manufacturing settings can be the cleanest work environments you will ever see.

What is most exciting, manufacturing careers come with benefits and overtime available through many employers.

The average manufacturing worker in the United States earns $37,500 annually, including pay and benefits. The average experienced CNC programer can earn more than $100,000 a year with benefits and overtime available through many employers.

The average entry-level CNC operation earns from $28,000 to $30,000 a year, with benefits and overtime available through many employers.

The average experienced CNC programer can earn more than $100,000 a year with benefits and overtime available through many employers.

AND EMPLOYERS ARE PAYING FOR QUALIFIED TALENT.

In 2012, the average manufacturing worker in the United States earned $77,556 annually, including pay and benefits.

The average entry-level CNC operation earns from $28,000 to $30,000 a year, with benefits and overtime available through many employers.

The average experienced CNC programer can earn more than $100,000 a year with benefits and overtime available through many employers.

Higher pay, better benefits, growth opportunities, that’s manufacturing.
There is a lot of discussion about your path. It comes from your parents, your teachers, or your guidance counselor. They ask you questions and they point you in many different directions. Behind all that noise, it comes down to you. Your passion, your education, and your career is about what you want to do.

To make that decision, you need all the facts. You need to know about careers that work with advanced technology, provide competitive salaries, and don’t require a mountain of student debt. Want to learn about an incredible opportunity? Keep reading.

Make Your Future Happen.

What's It All About
Manufacturing has always been the backbone of America. Over the past century the industry has grown. And trust us, your grandparents, and maybe even your parents, would not recognize today's manufacturing. Today’s manufacturing is about advanced technologies, state of the art facilities, and fast paced work environments. But most of all, manufacturing is about those people who like to see the product of a hard day’s work.

Made In America
Appliances, medicines, MP3 players, snowboards, guitars, and candy. All are very different items with a common trait. They are produced by an American manufacturer. You can develop medicine that saves someone’s life, or construct a massive airliner to fly home to your family, or create the instruments played at a concert by some of the world’s greatest artists. Not many people can say that of their job.

Facts and Figures
Manufacturing is about skills. It doesn’t require a four year degree and a mountain of debt to begin a manufacturing career. It requires hard work, dedication, and an industry certification to get the job done. And most of those certifications can be earned in two years or less. After that you could have a career as a machinist, or metalworker and be making more than your friends. An average of 18% more than your friends. Manufacturers have the highest combined salaries and benefits of any industry in the United States.

The highest salary and benefits of any industry in America belong to manufacturers.

SAVE LIVES, BUILDING PLANES, AND PLAYING MUSIC. ALL IN A DAY'S WORK.

YOUR JOB IS WAITING
You owe it to yourself to learn more about the opportunities that manufacturing has to offer. Here’s what you do:

- Visit www.mfgday.com and learn about manufacturing events and plant tours in your state.
- Check out www.usmanufacturingpipeline.com to take the career assessment and find the right path for you.
- Speak to your guidance counselor and ask to learn more about manufacturing or connect them with your local Dream It. Do It. program.
- Participate in your local SkillsUSA or FIRST robotics competition.
- Check out the Manufacturing Institute’s M-List to find a school where you can obtain manufacturing certifications.
The Institute will provide a full pdf and a print pdf version of the marketing materials.

The full pdf is to be used for in-house printing. Most materials can be printed on any standard size paper.

The print pdf is to be used for professional printing, and will include marks and bleeds.

If you need any specific printing marks, please contact The Manufacturing Institute.
When engaging with Dream It. Do It. partners, it is helpful to have firm knowledge about the national landscape of the U.S. manufacturing industry. Below are talking points that provide evidence of the importance of manufacturing to our economy and the challenges of our nation’s skills gap. For additional facts and stats on the manufacturing industry, please visit [http://www.themanufacturinginstitute.org/Research/Facts-About-Manufacturing/Facts.aspx](http://www.themanufacturinginstitute.org/Research/Facts-About-Manufacturing/Facts.aspx). State specific data is available at [http://www.nam.org/Data-And-Reports/State-Manufacturing-Data/](http://www.nam.org/Data-And-Reports/State-Manufacturing-Data/).

- Manufacturers contribute $2.08 trillion to the economy and for every dollar invested in manufacturing another $1.37 in additional value is created in supporting sectors of the economy. Manufacturing has the highest multiplier effect of any economic sector.

- Manufacturing supports an estimated 17.4 million jobs in the United States and about one in six private-sector jobs.

- Manufacturers in the United States perform two-thirds of private sector research and development in the nation, driving more innovation than any other sector.

- Taken alone, manufacturing in the United States would be the 8th largest economy in the world.

- If asked how best to provide 1,000 jobs in their community, Americans overwhelmingly choose manufacturing; yet only 1 out of 3 parents would encourage their children to pursue a career in manufacturing.

- There are hundreds of thousands open jobs in the United States.

- By 2025:
  - 2.7 Million babyboomers will retire
  - 700,000 jobs will open up due to economic expansion
  - Over the next decade nearly 3.5 million manufacturing jobs will be needed
  - Two million U.S. manufacturing jobs are expected to go unfilled
The Manufacturing Institute, APICS Supply Chain Council, and Deloitte worked together to understand why manufacturing isn’t getting its fair share of talented women. We surveyed more than 600 women in manufacturing, across all functional roles and levels, to get their gauge of how well companies are doing at attracting, retaining and advancing women. We also held an executive roundtable in Washington, D.C., where we convened senior leaders – representing a diverse group of some of the world’s largest manufacturing companies – to bring into focus their executive view of human capital and talent concerns. Read the full report: [http://www.themanufacturinginstitute.org/Research/Other-Institute-Reports/~media/9E6ED78EACB84084BD7A7C98B52B0E5C.ashx](http://www.themanufacturinginstitute.org/Research/Other-Institute-Reports/~media/9E6ED78EACB84084BD7A7C98B52B0E5C.ashx)

Manufacturing faces an estimated 2 million worker shortfall over the next decade, and manufacturing executives responding to a recent skills gap study report six out of 10 positions are currently unfilled due to the skills gap. With women representing less than a third of the manufacturing workforce, it’s clear manufacturers are missing out on a critical talent pool, which could aid remarkably in closing the skills gap.

- This year, there are 130 honorees and emerging leaders (women under 30) from over 100 companies.
- To date, more than 500 women have been recognized as honorees.
- While women represent nearly half (47%) of the total U.S. labor force, they comprise less than a third (27%) of the manufacturing workforce.
- Fortune 500 companies with high percentages of women officers had a 35 percent higher return on equity and a 34 percent higher total return than companies with fewer women executives.
- More than 2/3 of women indicate they would stay in manufacturing if they were to start their career today.
- When asked to rank the most impactful programs their organization offers that help in attracting and retaining women, flexible work practices, formal and informal mentorship programs, and improving the visibility of key leaders who serve as role models topped the list.
- 3/4 of respondents believe women are underrepresented within their organization’s leadership team.
- 2/3 of respondents indicate standards of performance are not the same for men and women.
- When asked if they would encourage a daughter or female family member to pursue a career in manufacturing, 24% would fully endorse and 42% would encourage with caveats.
- Only 12% of respondents believe the K-12 educational system actively encourages female students to pursue careers in their industry, and 53% believe it does not at all encourage females to pursue careers in manufacturing.
- While women make 77 cents to the dollar as compared to male wages in all fields; that gap closes to 92 cents to the dollar in STEM disciplines.

[https://www.millionwomenmentors.org/sites/default/files/resources/Women_in_STEM_-_Realizing_the_Potential.pdf](https://www.millionwomenmentors.org/sites/default/files/resources/Women_in_STEM_-_Realizing_the_Potential.pdf)
Advisory Committee: A committee whose members should represent business and industry, education, labor organizations, community, government, students, parents, and teachers. A majority of these members shall share a working knowledge of the job tasks and competencies required for related occupations, related labor market needs, and courses necessary to meet these needs. The committee provides advice in the design, development, delivery, evaluation, and continuous improvement of Career and Technical Education programs.

Apprenticeship: A combination of on-the-job training and related instruction in which workers learn the practical and theoretical aspects of a highly skilled occupation. Apprenticeship programs can be sponsored by individual employers, joint employer and labor groups, and/or employer associations.

Career and Technical Education (CTE): A planned program of courses and learning experiences that begins with exploration of career options; supports basic academic and life skills; and enables achievement of high academic standards, leadership, options for high skill, high wage employment preparation, and advanced and continuing education.

Career and Technical Student Organization (CTSO): Department of Education recognized organizations for individuals enrolled in a Career and Technical Education programs that engage in CTE leadership skill development activities as an integral part of the instructional program.

Career Cluster: A grouping of occupations and industries based on common aspects that provide students with a context for planning and studying academic and technical courses related to a career.

Career Pathway: A coherent, articulated sequence of rigorous academic and career related courses within a career cluster, commencing in ninth grade and leading to an industry-recognized certificate or licensure, an associate degree, and/or a baccalaureate and beyond.

CTE Concentrator: A secondary student who has enrolled in multiple CTE courses above the exploratory levels in a single cluster.

Exploratory Course: A CTE course in which students demonstrate the application of academic learning standards in the context of preparing for living, learning, and working; demonstrate foundational and occupational specific skills required to meet current industry standards; explore and demonstrate knowledge of career options within the related career cluster; and demonstrate leadership and employability skills.

Industry: A department or branch of a craft, art, business, or manufacture; especially: one that employs a large personnel and capital especially in manufacturing

Leadership Skills: The ability to preside, guide or manage self, others, activities or events with responsibility for the final outcome.

Manufacturing Competency Model: A multi-level model that includes each of the skill sets required for employees in manufacturing beginning with personal effectiveness, academic, and workplace competencies and building to occupationally specific skill sets.

Postsecondary Education: Includes pre-apprenticeship, apprenticeship, workforce training programs, community and technical colleges, and baccalaureate and post-baccalaureate opportunities.

Preparatory Course: A technically intensive and rigorous CTE course or sequence of courses in which students demonstrate mastery of occupational specific skills, including the application of academic learning standards as required to meet industry defined standards needed for a specific career; leads to a certificate or credential necessary for employment or offers dual credit; and leads to workforce entry, approved apprenticeships, or postsecondary education in a related field.

Program of Study: A coordinated, non-duplicative progression of courses within a career pathway that aligns academic and career and technical education in secondary education with postsecondary education to prepare students for an occupation or group of occupations within a career cluster.
**Soft Skills:** Workforce readiness skills defined by the Department of Labor that focus on six key skill areas: communication, enthusiasm and attitude, teamwork, networking, problem solving and critical thinking, and professionalism.

**STEM:** An acronym for Science, Technology, Engineering and Math education.

**STEAM:** An adaptation of STEM education that additionally includes Art.
Committee Members

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