



Manufacturing Engineering

Do you like figuring out how something should be put together? Manufacturing Engineers are the creative assemblers among all engineers. They design and operate the manufacturing systems for a product. They choose the best technologies and process to manufacture the product, such as equipment, tools, automation and robots. They also plan and design the factory that will produce the product, and they manage the running and maintenance of that factory.

The main goal of a Manufacturing Engineer is to create the stages of a system that produces a product in the most time-efficient and cost-effective way possible, while always maintaining worker safety and product quality.

Here are two short videos that show how two kid-favorite products are made. Think of all the work the Manufacturing Engineers did to make these possible!

How LEGO Bricks are Made – Millions are made and stored in the warehouse.

How Pringles are Made – First they make the package and then they make the chips!

Meet Allison, Manufacturing Engineering Student

Allison is a sophomore at Texas State University, studying Manufacturing Engineering. Her on-campus activities include being the Vice President of Programs for the Society of Women Engineers (SWE) and the Social Chair and Webmaster for the Society of Manufacturing Engineers (SME). She is also an Undergraduate Researcher, and is preparing to present her first research poster this month.



Why did you pick Manufacturing Engineering?

I was originally a Nursing Major and was required by my Psychology class to create

something as our final project. My professor mentioned a resource my university had, which offered 3D printers. I decided to 3D print a human brain and I was quickly amazed with 3D printing.

What do you plan to do with your degree?

Empowering others and giving back to communities is very important to me, so I plan to join Engineers Without Borders USA. [Learn more at the Engineers Without Borders website.](#)

What ways can Manufacturing Engineering be used to help society?

Manufacturing Engineers are well-equipped with critical thinking skills, creativity and a team-based mindset because much of our education involves working in groups to solve problems. Our focus is to improve tools, processes and machinery to aid in the safety and production of goods. Finding more affordable and safer ways to make things means a safer and more financially stable society!

Do you have any advice for young girls who want to be an engineer?

Find a role model, become involved in your school and never underestimate your worthiness to be where you are.

More Advice from Manufacturing Engineering College Students

Georgia is a senior in Manufacturing Engineering at Western Washington University in Bellingham, Washington. Last summer she was a Manufacturing Engineering Intern for John Deere in Iowa. She has recently accepted a job offer with The Boeing Company where she will work as a Manufacturing Engineer after graduating this year.



Georgia's advice to SWENexters: "There are so many different forms of Engineering, so at first it may seem overwhelming, but if you would like a hands-on career based around problem solving, then definitely consider engineering an option. Focus on your passions and what you excel at in grade school, and that should drive what discipline you pursue during college. Never be afraid to ask questions, ask for help or ask for advice from your peers or teachers. A large aspect of Engineering is communication and teamwork which comes naturally the more you collaborate with others. Engineering requires hard work, but if you are willing to put in the effort, then I guarantee you will become excited about the world around you and your career."

Vianey is an international student and senior at the University of Texas Rio Grande Valley, studying Manufacturing Engineering. Her on-campus activities include being Vice President of the Society of Women Engineers (SWE) section at



her college. She graduates in May 2019.

Vianey's advice for SWENexters: "DON'T FEEL INTIMIDATED BY THIS FIELD. It is no longer a man's world. We need more women engineers. I believe that our dedication and attention to detail brings a whole other level to engineering. And most importantly, don't belittle fellow women engineers. LET'S EMPOWER EACH OTHER. Your sister is not competition, she could be your greatest partner."

Karen is also an international student and senior at the University of Texas Rio Grande Valley, studying Manufacturing Engineering. Her on-campus activities include being President of the Society of Women Engineers (SWE) section at her college. Last summer she worked for Cummins, Inc. as a Quality Engineer Intern.



Karen's advice to SWENexters: "I would like to inspire girls to join engineering because there are a lot of applications and a lot of interesting stuff. Also, I would encourage them to always try to learn something new because there are many things that are evolving and being innovated. Don't be afraid of failing because the only way to learn is by failing."

Happy Women's History Month!

Every year March is designated as Women's History Month. The month is set aside to honor women's contributions in American history.

There are many women who have made a difference in history by inventing mechanical things, from Margaret E. Knight, who invented a machine to make a flat-bottomed paper bag in 1868, to Mary Anderson, who invented the windshield wiper in 1902. Although these women weren't educated as engineers, they had engineering skills and followed the Engineering Design Process of defining a problem, brainstorming possible solutions, designing, building, testing and redesigning until they had their final solution.

You can learn more about women engineers in history at the [EngineerGirl website](#).

The next time you need to write a school report on a historical figure, consider writing about a woman engineer!

Awards, Awards, Awards!

We love recognizing talented SWENexters who are involved in STEM activities! We think it is very important to celebrate your accomplishments and provide further encouragement as you explore and pursue engineering as a career.

Our most recent award recipients were honored at WE Local conferences in Baltimore on February 9th and St. Louis on March 2nd during the SWENext DesignLab events.



The Community Award winners at the Baltimore DesignLab event were: Michaela James, 7th grade, Yabesra Ewnetu, 8th grade, Mera Seifu, 8th grade, and Elizabeth Kim, 11th grade, all from the Baltimore area, and Madison Kenney, 10th grade, from Atlanta, Georgia

The Local Innovator Award winner was Christina Patterson, 12th grade, from Pittsburgh, Pennsylvania. This is the second time Christina has won this award, with the first time being at WE Local Providence last year. [You can see Christina's submission video here.](#)

Christina wrote a blog post about her experience at the SWENext DesignLab event. [You can read about it here.](#)

The Community Award winners at the St. Louis SWENext DesignLab event were: Paris French, 7th grade, Iva Lastarria, 8th grade, MacKenzie Williams, 8th grade, Makara Worthy, 8th grade, Madison Miles, 9th grade, Kristen Wallace, 11th grade, Rowan Dothager, 11th grade, all from the St. Louis area. Also winning the award were Madalyn Nguyen, 9th grade, from the San Diego area, and Brianna Bukowski, 10th grade, from the Chicago area.

Rowan also won a \$50 gift card for the Best Essay.

The Local Innovator Award winner was Aja Capel, 11th grade, from Urbana, Illinois. [You can see Aja's submission video here.](#)

Congratulations to all of the winners! We are so very proud of you!

SWENext Clubs Corner

From time to time, we feature a Middle School SWENext Club in the newsletter. This month, we are featuring the **Hoover Middle School SWENext Club**.



Over the past 6 years, the SWENext Club at Hoover Middle School in Waterloo, Iowa, has evolved from a “Women in STEM” club for just a few elementary school students to partnering with the Waterloo School District to draw lots of 6th and 7th graders into the community that it is today!

The club meets frequently to do hands-on activities and take field trips to local STEM companies to learn about different career opportunities. At the end of the school year they put on a STEM Fair to show off everything that the students have done to parents. They also discuss famous female scientists that discovered new elements on the **[periodic table](#)** or who worked for **[NASA](#)**. They also have a mentorship program formed between the students and local professionals!

This year, the club is focusing on highlighting “normal women” – those that students come across every day but may not know that they are hardworking STEM professionals and even mothers. The club advisors found that this was really beneficial to the students to have tangible role models to look up to and are able to find inspiration to make and achieve goals in STEM. Most importantly, the students know that they can one day be like that, too!

Interested in having your SWENext Club highlighted in the monthly SWENext Newsletter? Email Haley, the SWENext Clubs Reporter, at **hla37@cornell.edu**!

How to Start a SWENext Club

Are you wondering how you can start a SWENext Club at your school? We want to make that easy for you. **[Check out SWENext Clubs 101 to learn more.](#)** And see our newly added **[SWENext Club Resources for Middle School clubs](#)** on the SWENext website. Everything you need to get going is there!

To register a SWENext Club, you must have a SWE member as an advisor. Your

teacher can serve as an advisor by joining SWE for a reduced rate as an [Educator Member](#). Or find your [local SWE section](#) to contact SWE members near you.

Questions about SWENext Clubs? Contact us at outreach@swe.org.

Wonder Park

The National Girls Collaborative Project (NGCP) is thrilled to be working with Paramount Pictures on the release of their latest animated feature film, [Wonder Park](#).

Wonder Park tells the story of a magnificent amusement park where the imagination of a wildly creative girl named June comes alive. One magical day, June is running through the woods to find her way home where she discovers an old rollercoaster car and climbs inside. She suddenly finds herself in Wonderland, an amusement park she had created in her mind and put aside. All of her rides and characters are brought to life but are falling into disarray without her. Now, with the help of her fun and lovable park characters, June will have to put the wonder back in Wonderland before it is lost forever.



Celebrate #WonderPark by sharing the creative side of #STEM! Experience the wonder of imagination and #making when @WonderParkMovie hits theatres March 15th!

Ten NGCP Collaboratives will be hosting free screenings of WONDERPARK, each followed by an impactful “Girls and Women in STEM” panel facilitated by the NGCP WONDERPARK Film Screening Toolkit. Screening locations are as follows: Atlanta, GA; Austin, TX; Brooklyn, NY; Dallas, TX; Hartford, CT; Los Angeles, CA; New York, NY; Oakland, CA; Portland, OR; San Diego, CA. Registration links for these locations will be up soon on the [NGCP Events page](#), so check it out!

SWENext Engineering Challenge with a Chance to Win a Freebie!

Manufacturing Engineers design and operate the manufacturing systems for a product. They apply their technical skills to evaluate which parts of manufacturing process can be improved to make it run more quickly and make better

quality products. The improvements they make can range from upgrading a piece of equipment to introducing a new tool for a worker on the manufacturing line to use.



This month, we're challenging you to think like a Manufacturing Engineer by executing and improving a greeting card making process.

You'll need the following materials:

- Paper: printer paper, construction paper, or any other type of paper
- Writing utensils: pencils, pens, markers
- Stickers, stencils, or any other decorations you have

Once you have all your materials, follow this procedure:

1. Grab a pencil and piece of paper to sketch out your greeting card design. When any new process is introduced, there needs to be a plan from the design team!
2. Using only a piece of paper and a single writing utensil, make your greeting card. Use a timer to see how long making the card takes you, and record that time on a spare piece of paper.
3. Look at your finished greeting card and think about what additional writing utensils, pre-made stencils, stickers, and other tools would make it easier for you to create a second version of the card. Gather and/or prepare these tools.
4. Using a new piece of paper and your expanded set of card-making tools, make your greeting card again following your new process. Time how long it takes to make the card and record the time on your spare piece of paper.
5. Compare the results from the old and new card making processes.
 - a. Which process took less time?
 - b. Which process produced a better-looking card?

Sometimes, it will take longer to make a better-quality product. And that's okay, if that is the product that needs to be made. If you want to, update your card making process a third time to make the better-looking card even faster!

Once you are done, send us a picture of your greeting cards and your results. **Please email your entry to swenext@swe.org by April 5th. Each month, a lucky winner will be selected from the submissions to win a SWENext freebie.** Don't miss the chance! All it takes is a few minutes.



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