SWENext Newsletter - 9-12

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What is Mechanical Engineering?

Mechanical Engineering is one of the most diverse and versatile engineering disciplines. Mechanical Engineers can work in any industry, such as Aerospace, Biotechnology, and Automotive. The discipline requires a core understanding of general engineering principles including thermodynamics, mechanical systems, computer-assisted design (CAD) modeling and material science.

Learn more about Mechanical Engineering in this video.

Day in the Life of a Mechanical Engineer

Adriana is a Mechanical Engineer with BP. **Find out** how she got there, the type of projects she's working on, and how you can #BeThatEngineer on SWE's *All Together* Blog.

Don't "Find" Your Passion…Develop It!

We have all heard the advice, "The key to a successful career is to find your passion." However, this might not be as good as once hoped.

Finding your passion will force a fixed mindset of an opportunity. For example, if you are passionate about a STEM-related discipline like building the next-generation rocket ship, you will be more inclined to focus all your time researching and improving your understanding on that one concept. According to Stanford researchers, this “fixed focus” on one area would likely lead to failure as those who follow a fixed mindset are more likely to give up when obstacles arise. They state, “Urging people to find their passion may lead them to put all their eggs in one basket but then to drop that basket when it becomes difficult to carry.”

A **recent Stanford research paper** aimed to prove the nature of fixed interests. They asked two groups of students who either identified as a “techie” (interested in STEM topics) or “fuzzy” (interested in arts and humanities). Each group read two articles, one STEM-focused, the other related to humanities. The study confirmed that the techies were more open to the STEM articles than the humanities, and vice versa.

The problem with fixed-focus interests is most problems involve solutions that are interdisciplinary. For example, the rocket ship concept was first noted in Greek mythology as a sun chariot. Also, the first notion of rocket flight came from the historical writings of Aulus Gellius, who states that a man named Archytas designed a wooden bird that could fly as Apollo’s chariot. Developers of the modern rocket studied historical and mythological records to inspire their design, and eventually get the first man into space.

Therefore, as better advice, the key to a successful career is not to “find” your passion, but to develop it. By focusing on all learned concepts fluidly, you will have a better chance to overcome challenges and build the commitment to succeed.

The Magic of the Fibonacci Sequence

National Fibonacci Day is November 23rd, and it is the day where we acknowledge the statistical beauty of the world.

The number sequence was created by Italian mathematician Leonardo of Pisa, later known as Fibonacci, while he was studying the mating pattern of rabbits. The sequence was adopted by other mathematicians to explain natural phenomena, such as the pattern of sea shells. The sequence forms a series of ratios, known as the “magical” golden ratio, which can be applied in various subjects, like music, art and behavioral science.

The following are two videos to check out about the magical coincidence of the Fibonacci Sequence in nature:

- **Fibonacci Sequence Examples in Nature**
- **The Magic of Fibonacci Numbers (TED Talk)**

2020 SWENext Awards Season – Apply Now

Do you live within a couple of hours of **San Diego, Buffalo or Des Moines**? Are you willing to travel to one of these cities early next year with your friends? If so, read on!

We are excited to announce the 2020 SWENext Awards and the DesignLab Community Engagement Challenge.

The **SWENext STEM in Action Award** recognizes girls in **grades 6-12** who are actively interested in STEM and doing something in their community about it (for example, raising awareness, mentoring students, participating in SWENext, etc.). STEM in Action Award recipients will attend the DesignLab event where they will meet women engineers, learn about careers in engineering, learn how to be a role model and watch the DesignLab presentations. They will also receive a certificate during the awards ceremony.

Juniors and seniors who apply for the **STEM in Action Award** will have an opportunity to be deemed a Local Innovator. They will also attend the DesignLab event where they will receive a SWENext trophy and a mentoring session with a SWE member. To be considered for the Innovator award, juniors and seniors must submit a three-minute video with their STEM in Action application discussing their involvement with STEM and what they are doing in their community.

These are rolling applications which means we will review your application and determine the award within two weeks of your application. Apply early so you can save your seat at the DesignLab event! Learn more and apply today!

The DesignLab Event in San Diego will be held on February 1, 2020.
STEM in Action Award Application Deadline: January 5, 2020 - **STEM in Action Application**

The DesignLab Event in Buffalo will be held on March 28, 2020.
STEM in Action Award Application Deadline: March 1, 2020 - **STEM in Action Application**

The DesignLab Event in Des Moines will be held on April 18, 2020
STEM in Action Award Application Deadline: March 22, 2020 - **STEM in Action Application**

The **DesignLab Community Engagement Challenge** will happen at the same time in the same cities as the STEM-in-Action Award. The Challenge asks **teams of high school students** to create a hands-on

engineering activity for younger students that will help resolve a local issue. Teams who enter the challenge will gain experience with STEM outreach, project implementation and leadership.

The teams will present their proposal to a panel of women engineers at the **DesignLab Event for a chance to win $1,000 to implement their project**. Winning teams then implement their project and create a video about it. The winner of the best project and video will **win an all-expense paid trip to SWE's annual conference, WE20, in New Orleans, Louisiana.**

The DesignLab Challenge provides students with:

- The opportunity to make an impact on your community using engineering.
- Serve as a role model and inspire the next generation of women in STEM.
- Engage with a woman engineer who will serve as the teams SWE Challenge Mentor to assist the team with program development and connect you to other SWE resources.

The first step is to let us know that you would like to enter the Challenge.

Read the Proposal Brief Here. This will give you an overall understanding of the challenge objectives and requirements.

Then, assemble your team and submit an Entry Form. Your team must consist of 5 to 15 high school students and one faculty member. At least 50% of your team must identify as female. Once an Entry Form is submitted, your team will be paired with a SWE Challenge Mentor. **Click here to view the Entry Form.**

The deadline to submit an entry form varies by site:

- Buffalo's deadline: January 12, 2020
- Des Moines' deadline: January 26, 2020

Learn more about the DesignLab Challenge!

If you have any questions, email **swenext@swe.org**.

2019 SWENext Global Innovator Award Winners

Five high school students were honored with the **SWENext Global Innovator Award** for their pursuits of engineering projects, their understanding of engineering principles, their roles in inspiring young girls to pursue engineering and their contributions to the communities they live in. They were honored at a formal ceremony at WE19, SWE's annual conference on November 8th, 2019, in Anaheim, California.

The winners were:

- Alice Ao – Atlanta Section
- Aja Capel – Central Illinois Section
- Kaitlyn Ludlam – Florida's First Coast Section
- Aishwarya Velu – Boston Section
- Aimee Xu – San Joaquin Valley Section

Watch their submission videos on the SWENext YouTube Channel and be inspired!

We also awarded 10 Honorable Mentions:

- Georgia Danehy – Hampton Roads (Newport News, VA) section
- Claire Taranowski – Chicago Regional section
- Erica Hsueh – Orange County section
- Emma Kalif – New England Shoreline Section
- Jeehye (Rose) Lee – Baltimore/Washington Section
- Emma Martz – Sacramento Valley Section
- Olivia Pierce – Boston Section
- Alina Pollner – San Diego Section
- Anesha Santhanam – New Jersey Section
- Anushka Gupta – San Diego Section

For more inspiration, **watch their submission videos** on the "honorable mention" playlist.

Congratulations, future engineers! Well done!

Did you know? SWENexters are aligned with a SWE professional section based on

their zip code!

Bekah Travis – High School SWENext Alum

“Engineering is tough, no matter which discipline, but it is worth it. There will be moments of failure, and there will be moments of triumph, but remember that at the end of the day, you will be creating the future.”

Meet Bekah Travis – a Benjamin Franklin High School SWENext alum from New Orleans, LA! She founded the club in 2016 with the goal of being the leaders in elementary and middle school STEM outreach in their local communities. She is currently an undergraduate student in Mechanical Engineering at **Georgia Tech**!

She says, “Mechanical Engineering is more than just physics and math. It is about learning how to both design and fix systems and to communicate with everyone involved with the systems, especially other engineers. We take classes beyond physics and math, including chemistry, circuits, computer science, and materials so that we have a base understanding of each piece of the larger picture.”

At school she is involved in Wreck Racing, a competition racecar team; she is a volunteer with Special Olympics; and she is very involved in Georgia Tech SWE! She advises multiple SWENext Clubs and creates events to reach out to young women. She also searches for STEM events in the local area for her SWE Section to volunteer at.

When she is not in the classroom, you can find her traveling, hiking, working with cars, listening to Broadway music or going to Zumba class! We are so excited to see this former SWENext Club member thriving!

Poway High School SWENext Club

We'd like to shout out to the Poway High School (PHS) SWENext Club hailing from San Diego, California. This fantastic club was founded in September 2018 by three extraordinary members of FIRST Robotics Competition **Team Spyder 1622**.

These students wanted to inspire and empower girls to do STEM. They brought SWENext to Poway High to build a community, providing support and encouragement for all the female members on Team Spyder.

An inspiring activity that the Club has participated in has been the "STEM Career Series" where the students heard weekly talks from different STEM professionals. They also took a tour of Virgin Orbit where they learned about engineering and space exploration.

These SWENexters are also involved in their community! Many of their members are mentors for FIRST Lego League (FLL) and FIRST Tech Challenge (FTC) teams. They hosted a FLL Workshop for 8 brand new teams, and they hosted the FIRST Annual FLL Jr. Expo for three elementary schools. These SWENexters also judge and volunteer at FLL tournaments and FTC events. They are a Community Partner with the Girl Scouts, too! Their extraordinary work in the community didn't go unnoticed – they were recently **highlighted by the San Diego Union Tribune**. Check out their Instagram: @phs_swenextclub!

#SWENextChallenge - November Edition!

Share a picture of your desk or workspace. What about it makes it work for you?

To enter this month's challenge:

1. Make sure to follow @SWENext on Instagram (if you're not already!)
2. Post a photo or video to your account with a caption that explains your submission/answering the question.
3. Mention us (@SWENext) and use the hashtag #SWENextChallenge in your caption.

Make sure to post before the challenge ends on November 28th (11:59 pm CT). Winner will be announced by the end of the month!

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