



SWENextEd Newsletter - May 2019

Welcome to the May issue of SWENextEd. In this issue, we highlight **Mining Engineering**. Mining engineers design and oversee the construction of safe mines for removing coal and metals. We provide activities to incorporate into your lesson plans that get your students thinking like a mining engineer, and we introduce you to the women who helped change laws restricting women in the mining profession. In this newsletter, we also announce a free webinar, presented by K-12 Educator member Mariel Kolker, discussing how to close the gender gap in engineering. Get in on the conversation and **join our SWENextEd Facebook page** to participate in engaging discussions and receive tips for the classroom, resources for educators and more!

Dig Into Lessons on Mining

Have your elementary school students **mine for beans** to learn about the extraction of limited, nonrenewable resources. In the activity, students will gain an understanding of why resource extraction becomes increasingly difficult with time. **Investigate electrolysis**, a process that uses a direct electric current to cause a chemical reaction, with your middle school students so they can learn how copper is purified. Looking for high school resources? With classroom extensions from **Dig Into Mining**, your students can explore biological technology as it relates to mining and wastewater treatment, or investigate how satellite imagery helps mining engineers gain information about mines. Are your students itching to see mining in action? Take your class on a **virtual field trip** to a copper mine and through the copper processing steps to learn about careers in the mining industry.



The Women Who Changed Mining Laws

Less than 50 years ago, women across the globe were banned from all underground employment by legislation such as the Mines and Collieries Act of 1842. Although extreme prejudice had given rise to superstitions that women were bad luck underground, Diana Baldwin and Anita Cherry did not shy away from becoming the first female miners in American



History. Hired to work at Beth-Elkhorn Coal Corporation's Mine 29 in 1973, Diana and Anita pioneered their way through the male dominated field with determination to support their families. An [original newspaper article](#) captured Diana's excitement: "There was one man who stood at one end and one who stood at the other and he says, 'Do you know you're making history?' That thrilled me to death. And they were so pleased for us."

Although we have made great strides since 1973, the mining industry is still only 13% female. The Society for Mining, Metallurgy and Exploration (SME) is hopeful that through outreach and education those numbers will improve with their 30-and-under membership rising to almost 20% in recent years. [Read more about SME and one of the first female mining graduates from Colorado School of Mines here](#) and [view another original news article here](#).



She Can Change the World: Help Her See Herself as an Engineer

A recent [study by Microsoft](#) shows that although 51% of high school students feel powerful doing STEM and 64% know how to pursue a STEM career, only 31% think coding jobs could be for them. Why the disparity? Many students don't fully understand what an engineering career entails. A 14-year-old girl from the survey answers, "It'd be really cool to see



women in STEM careers on posters in the hall, in our history and science texts, and visit our classes...my tests say I'm a good engineer, and I wish I knew what that looked like in real life." Although 74% of girls are interested in STEM according to a [study by Girl Scouts](#), many girls have the misconception that engineering solely revolves around computers and robots. This same study shows that of the girls who indicated they were interested in STEM, 94% believe that helping people is an important career motivation; however, choosing to pursue a career in STEM which can bring those motivations to fruition still isn't the dominant choice. To abate this paradox, it is imperative that girls understand that engineering is about much more than simply math and science. At its core, engineering is about solving problems to help people. Adding a dimension of social applicability to engineering curriculum can be eye-opening for a girl interested in STEM.

Need inspiration for socially applicable STEM lessons? Check out PBS's "[10 Lesson Plans that will Change the World.](#)"



Free Webinar: How Do We Close the Gender Gap in Engineering?

Register now for a free webinar on May 23rd at 7 PM Central, presented by SWE K-12 Educator committee member **[Mariel Kolker!](#)**

Girls receive the message, from the day they are born, that science and engineering are not for them. Hear how cultural messaging affects girls' experiences in science classes, and how they fundamentally differ from those of boys. Research indicates that girls experience higher levels of anxiety and lower levels of self-efficacy in science classes. Due to gendered social conditioning regarding career expectations, girls have lower confidence and are biased against themselves when it comes to science and math. Learn what we as teachers, parents and professionals can do to help girls recognize and embrace their strengths in science.

This presentation is grounded in research on the STEM gender gap and in the experience of teaching an all-girls high school engineering course. Girls form their science identity and before college, meaning it is imperative to engage girls in middle and high school and to help them to realize their potential. Learn the remarkable differences between what girls and boys need to succeed in science and engineering and what you can do to help the girls in your life.



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