

swe **NEXT**



Mining Engineering

Earth is jam-packed with valuable resources but how do we get to them? Mining Engineers!

Mining Engineering is an engineering discipline that involves the practice, theory, science, technology and application of extracting and processing minerals from a naturally occurring environment. Minerals that are mined include gold, silver, copper, iron ore and nickel.



If you are a Mining Engineer, you'll work with geologists to find and appraise these minerals. You'll also design mine layouts and develop ways to harvest materials safely without destroying the land above. Mining Engineering is associated with many other "sister" departments like geology, mineral processing and metallurgy, geotechnical engineering and surveying.

Meet Kristin Guerin, a Mining Engineer in Montana

Kristin got her Bachelors of Applied Science in Mining Engineering in 2011 from the Colorado School of Mines and got her Masters of Science in Mining and Mineral Engineering from the Missouri University of Science and Technology in 2017.

During college she had three summer internships with multiple companies so that she could find out what she liked the most. She worked for Rio Tinto Minerals, Colowyo Coal Company and Colorado School of Mines. Once she graduated, she started working for Caterpillar Inc. as a Pit Operator working on the Autonomous



Haulage solutions team at the Solomon mine. She had to fly in and fly out of work every day, and it was really fun.

She now works as an official Mine Engineer for Westmoreland Coal Company in Montana. She has been a member of the Society of Mining, Metallurgy and Exploration Group (SME) as well as the Society of Women Engineers through college and into her professional career. Kristin has been very active in extra-curricular activities like SME and SWE, because they help her expand her professional network and personal growth.

Meet Marie, a Mining Engineering Student

Marie is a senior at Colorado School of Mines studying Mining Engineering. She was a part of the first all-women mine rescue team, she founded the Women in Mining (WIM) Student Chapter, and is serving as the Society for Mining, Metallurgy and Exploration (SME) Student Chapter president.



Why did you pick Mining Engineering?

I have wanted to work in the mining industry since middle school. I love the interdisciplinary nature of the job. I get to apply knowledge about geology, civil engineering, optimization and humanitarian engineering. Plus, I love the big trucks!

What do you plan to do with your degree?

I will be working for Newmont Mining Corporation in Nevada at an open pit gold mine. I will be an ore control engineer which means I will do grade analysis of the mined material and make a blend for the gold processing mill.

What ways can Manufacturing Engineering be used to help society?

Mining Engineering is necessary for society to survive. Without raw materials our society would not have cell phones, buildings, roads, farming equipment, or anything that we rely on in our daily lives.

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

My advice would be to find what you are passionate about and follow it, no matter what.

Meet Kinsley, a Mining Engineering Student

Kinsley is a senior at Colorado School of Mines studying Mining Engineering. She is actively involved in Kappa Alpha Theta, Society of Mining, Metallurgy, and Exploration, and Society of Women Engineers.

She is one of the founders of the Colorado School of Mines' Women in Mining chapter.



Why did you pick Mining Engineering?

I chose Mining Engineering because it is a very unique type of engineering that merges civil, geological, and mechanical engineering and allows me to choose whether I want to be in an office or out in the field. In the mining industry, we have a saying: "Everything that can't be grown has to be mined." I thought that it was so cool that I could contribute to society on such a significant level.

What do you plan to do with your degree?

After graduation, I am going to work as an explosives engineer planning blast patterns and watching blasts go off. If you haven't had a chance to look at some awesome blast videos, I would highly recommend it since they are really cool. [Here's one of many.](#)

What ways can Mining Engineering be used to help society?

Everything in society is given to us because of a Mining Engineer. Anything that has been processed or manufactured had a lot of mined material go into it. Also, Mining Engineering tends to work in a lot of remote (and often poor) parts of the world and can help develop these areas through education and other outreach events.

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

When you get to college, take your time. I know there is a lot of pressure to finish college in four years, but take the co-ops and internships that come your way because they will teach you more than professors can in a classroom.

SWENext Clubs Corner

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

The Lil' SWEesters SWENext Club was started by the [University of Rhode Island \(URI\) Collegiate Section](#) to bring STEM outreach efforts to middle school girls in their area. URI SWEesters first began by teaching their Lil' SWEesters about different types of engineering by telling them about their majors and answering any additional questions.



They've also done some awesome hands-on activities like [building a bridge](#) on a "limited-budget" that had to withstand a shaker table. The Lil' SWEesters also have

gotten the chance to check out different resources at URI! They attended the Graduate School of Oceanography Open House and learned about future opportunities in the oceanography field.

SWENexters have also gotten to learn how to use important laboratory research tools such as [micropipettes](#), [electroporation](#) and [insect dissecting microscopes](#). They even got to explore the SynDavers lab which holds synthetic cadavers used in anatomy labs! Welcome to the SWE family, Lil' SWEesters!

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? [Check out SWENext Clubs 101 to learn how](#). 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.

Are You an EngineerGirl?



The [EngineerGirl website](#) shows girls and young women the exciting opportunities in engineering. Despite an increase in women in many traditionally male-dominated professions such as medicine and law, women remain grossly under-represented in engineering.

Engineering and engineers are central to the process of innovation, like designing new cell phones, self-driving cars and rockets that can reach Mars. When women are left out of the process of innovation, we lose their creativity and hurt innovation.



We want the creative problem-solvers of tomorrow to fully represent the world's population, both women and men, because they will be the ones to ensure our health, happiness and safety in years to come.

Ever wonder?...

What different kinds of Engineering are there? And what do they do?



EngineerGirl has:

- A list of many Engineering careers
- Descriptions of what they do
- Fun facts about Engineering
- How Women Engineers shape the future

What is it like to be a Woman Engineer?

You can learn from Women Engineers themselves! The website has interviews, Day in the Life articles, I'm an Engineer stories, historical engineers and Ask an Engineer.

How can I become an Engineer?

EngineerGirl makes available multiple different helpful tools to get you prepared for an exciting career in Engineering. There are:

- Online contests, quizzes and polls to help you challenge yourself
- Information on Clubs & Programs to help you get more involved
- Scholarships to help you get there through financial support
- And MORE!!

You will have to [explore this amazing site](#) for yourself to find all that it has to offer. Enjoy!

SWENext Engineering Challenge with a Chance to Win a

Freebie!

Mining Engineers apply their science and technology knowledge to plan activities in which miners discover and then extract minerals and other natural resources from on and under the Earth's surface. They might plan operations including exploration and discovery of a mineral resource or mine design and operation.

This month, we're challenging you to think like a Mining Engineer by planning and executing a chocolate chip mining operation!

You'll need the following materials:

- Hard chocolate chip cookies either store bought or homemade (if you don't like chocolate, make sure there's another candy or fruit item in your cookie!)
- Toothpicks
- Plate, wax paper, paper towel or another surface to perform your mining operation on
- The [activity worksheet](#) from California Academy of Sciences

Once you have all your materials, follow this procedure on the worksheet:

1. Sketch your cookie and the "habitat" surrounding it (the paper plate or towel that your cookie is on).
2. Use your imagination to describe the ecosystem your cookie "lives" in, what other creatures live there, and how humans interact with the environment.
3. Use your toothpicks to mine for chocolate chips (or candy pieces). Store your successfully mined goods off to the side of your mining area.
4. After you are done extracting the chocolate chips, put the remaining pieces of the cookie back together as best as you can.
5. Sketch what your cookie and the surrounding "habitat" looks like AFTER mining.
6. Describe how the ecosystem has changed, what lives there now, and how we can avoid harming the ecosystem in the future when we mine

If you want to, try mining another cookie with a new, more environmentally friendly technique!

Once you are done, send us a picture and let us know how your mining went. Email your entry to swenext@swe.org by **May 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.





130 East Randolph Street, Suite 3500
Chicago, IL 60601

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