

swe **NEXT**



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Women's History Month

Did you know that March is Women's History Month? It's a time to learn about and recognize the great contributions that women have made to our world. That includes women engineers!

Learn about famous women engineers at the [EngineerGirl website](#) and take [SWE's Women Inventors Quiz](#).



And the next time you need to write an essay about a famous person, consider writing one about a woman engineer!

Chemical Engineering



Chemical Engineers use chemistry, physics, math,



and engineering tools to make products we use every day, such as medicines, laundry detergents, shampoos, toothpaste, paints, and lipstick.

Chemical Engineers also produce and process food, purify drinking water, refine gasoline from petroleum, and treat waste. They can work in chemical manufacturing, electronics, pollution control, or in the lab where they develop new and improved products.

Read more about it on the [EngineerGirl-Engineering Careers page](#).

Meet Kate Nolan, Chemical Engineer

By 4th grade, I had decided that my future career would involve math and science. But what would I choose? Years later, when I was in high school, my dad (an Electrical Engineer) brought home a magazine with a list of the types of engineering. That was the first moment I remember reading about Chemical Engineering, and I was hooked on the idea of using chemistry on a large scale to improve peoples' lives.



Kate Nolan with the F/A-18 Blue Angels

I attended the University of Missouri and graduated in 2013 with a B.S. in Chemical Engineering and a minor in German. During my freshman and sophomore years of college, I worked in research labs, gaining experience in materials research and battery technology.

After my sophomore year, I worked at Lexmark International in Kentucky, working on materials research and development for laser printers. After my junior year, I headed to Seattle to intern at Boeing, where I gained experience in chemical processing, environmental compliance, and aircraft manufacturing.

Once I graduated, I had the opportunity to move back to St. Louis, my hometown, where I now work for Boeing as a materials and process engineer, focusing on paint, sealing, and corrosion prevention for the new 777X airplane.

I've been involved in the design of this airplane from day one, with an incredible team of bright engineers who solve challenges together. And now, we are actually building the aircraft and getting ready for the first flight in a few years.

I use electrochemistry and kinetics principles to select paints, sealants, and materials that will reduce and eliminate the risk of corrosion. I am also involved in making

positive changes for paint operations personnel and the environment, by using newer, safer materials that do not contain toxic components.

Despite a years-long love of aerospace, I never thought that my degree in Chemical Engineering would lead me to working in the industry on the newest commercial airplane. I honestly believe that I have my dream job!



Keeping up with SWENext DesignLab

Are you excited for the upcoming [SWENext DesignLab](#) season? Registration for all the hands-on engineering events is now open! Click on the city buttons below to register.

[Register for Portland, Oregon - April 7](#)

[Register for Providence, Rhode Island - April 21](#)

SWENext Engineering Challenge with a chance to win a freebie

Chemical Engineers help design processes to make products we use every day, including peanut butter, crackers, dish soap, crayons, and paper towels.

This month, we're challenging you to be a Chemical Engineer and make a small batch of plastic from milk and vinegar, and then design something from it.



Plastics are polymers made of long chains of molecules. Milk contains many molecules of a protein called casein, and when you heat milk and add acid (like vinegar), the casein molecules unfold into a long polymer chain. This chain can be scooped up and molded, which is why it is a plastic.

[Check out this site](#) if you want to learn more about plastics and polymers before starting your experiment.

You'll need the following materials for your small-scale plastic production:

- 1 cup of milk
- 1 tablespoon of vinegar
- 1 small pan

- A spoon
- A strainer or cloth
- Paper towels
- Food coloring (optional)
- Glitter, markers, paint, or other decorating supplies

MAKE SURE YOU GET HELP FROM AN ADULT WHEN YOU HEAT THE MILK!

To make the plastic, follow these steps:

1. Put one cup of milk in a pan and heat it until it's warm. You don't need to boil the milk, just heat it. **GET HELP FROM AN ADULT FOR THIS STEP!**
2. Optional: If you're adding food coloring, do so now.
3. Stir in 1 tablespoon of vinegar into the warm milk. Watch the vinegar separate the milk into curds and whey as you stir.
4. Pour the separated mixture of curds and whey/vinegar into a strainer so you can recover the moldable curds.
5. Mold your plastic into any shape you want to make a bead, an ornament, or whatever you can think of!
6. Add any glitter or other decorations you want to stick to your creation while it's still wet.
7. Let your creation dry for 12 to 48 hours. Then, use markers, paint, or any other materials to decorate your creation further after it dries.

If you're feeling adventurous, you can try making another batch with different amounts of milk and vinegar to see how it affects the texture of the case in plastic [as directed here.](#)

Be proud of your new creation and share it with SWENext! 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 and a great picture. **Please email your entry to swenext@swe.org by March 30.**



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