

# The 28 Percent

Women make up only 28% of the STEM workforce. This newsletter aims to change that.

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Art By Hudson Zortman

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## INTERNATIONAL WOMENS DAY

March 8, 2023

International Women's Day (March 8) is a global day celebrating the social, economic, cultural, and political achievements of women.

The UN theme for this year's International Women's Day is "DigitALL: Innovation and technology for gender equality".

### 5 Facts About International Women's Day

1. In 1909, 15,000 women protested in New York City for the first National Women's Day. They were fighting for labor and voting rights.
2. In 1910, attendees at the International Conference of Working Women voted unanimously to approve an International Women's Day.
3. International Women's Day was honored for the first time in March 1911. The date was fixed on March 8 two years later.
4. The United Nations celebrated International Women's Day for the first time in 1975.
5. In 2011, International Women's day celebrated its 100-year centenary. Celebrations took place in Austria, Denmark, Germany, and Switzerland; the same countries that held the first event 100 years earlier.



Celebrate International Women's Day this year by learning more about notable women in technology, donating to women's activist groups fighting to protect women's rights, and spending time celebrating the cool women in your life!

# The Learning Curve: A Student Anthology Amplifying PUSD Student Voices

By: Morgan Gaskell

Created by the PUSD Student Think Tank, the Learning Curve, affectionately known as TLC, is one of the group's most important projects to date. First created over the pandemic during the think tank's first year by three students including PHS's very own Mya Hernandez (class of 23'), the Learning Curve began as an initiative to bring students to the center of the conversation around our own education, to educate teachers and staff on the daily lives and experiences of the students they interact with each and every day. Open to all Pasadena Unified School District high schoolers, the think tank collected 60 stories that ranged in topics from online learning during the COVID-19 pandemic, to crossing the U.S.-Mexico border, to both positive and negative student-teacher experiences, and more. Volume 1 of The Learning Curve went on to be used in student-led professional development workshops for teachers, in a think tank presentation to the PUSD Board of Education, and was also presented at many of the PUSD high school campuses during their biweekly Monday meetings.

The important work continued in the spring of 2022 for its second volume and the number of student stories that were collected rose to over 150!



This volume was once again used in multiple professional development workshops led by students, where think tank members read their own stories in the anthology to many teachers across the district. Many teachers explained how they were surprised by the stories students submitted, that they had no idea what students experienced on a day to day basis at home or in the classroom.

This spring, the think tank has begun work on Volume three of The Learning Curve and is aiming to make the anthology more accessible and inclusive this year. Because many of the teachers attending professional development workshops with the think tank were teaching at middle schools, the Spring 2023 edition of The Learning Curve is now reaching out to each of the PUSD middle schools so that they can submit stories too! We also plan to feature stories from the anthology on our social media accounts.

This is a move to get more people interested in student narratives and perspectives, the work of the think tank, as well as to connect with a larger audience, particularly the PUSD student body.

What is written in the Learning Curve by students really does go on to have a huge impact. It puts students at the center of our own education, informs PUSD administration, teachers, and staff on how to better provide for the needs of students. The Learning Curve is a wake-up call to teachers and principals, urging them to look at student as unique individuals with rich stories rather than just a person to give assignments and tests to. The anthology brings awareness and understanding, action and change. Please consider being part of this movement to emphasize student voices in the school district by submitting a story through the submission form here: [tinyurl.com/nhdw77bv](https://tinyurl.com/nhdw77bv) the prompt is very open ended: "What is something you would want teachers, PUSD administration, and/or students to know." You can write about anything, good or bad, traumatic or happy. The Learning Curve is your space to share your voice!

This is a move to get more people interested in student narratives and perspectives, the work of the think tank, as well as to connect with a larger audience, particularly the PUSD student body.



You can read Volume 1 and Volume 2 of The Learning Curve at our website: [pusd.us/thinktank](https://pusd.us/thinktank). Please also consider following our Instagram @PUSDthinktank.



# Rachel Trabert: Advice from a STEM

By: Paulina McConnell

How would it feel to be the last line of inspection on a cutting-edge space mission? To oversee the final tests and simulations before astronauts step into your spacecraft, launch into the sky, and make history? For Rachel Trabert, integration and test engineer at Jet Propulsion Laboratory, it's a dream come true for a "moth to the STEM flame" like her.

"I'm part of the team that accepts all of the hardware, integrates it together into the final piece - the spacecraft - and then gets it through its series of environmental tests. We put it through a whole rigorous campaign to ensure that it's space-worthy," Trabert explains. "I write a lot of procedures, and I spend a lot of time operating the spacecraft." Since receiving her bachelor's in aerospace engineering in 2011, and then her master's in space science in 2012 from the University of Michigan ("Space science, you can think of like: the physics of the sun, how our magnetosphere works - things that deal with the earth and the sun's interactions"), Trabert has worked on a number of studies, flight projects, and even international building endeavors with JPL.

Her current project is an exciting one: Europa Clipper. Planned to launch in 2024, Clipper will investigate Jupiter's moon, Europa, to determine if it has conditions suitable for life. "Clipper is an incredible mission.

It's the most ambitious mission we've ever tried to fly, especially out of JPL," Trabert says animatedly. "Just to give you a scale of this mission: it's so big that we had to reinforce the floors at JPL!" "It's really gonna hopefully open our eyes to a lot of things. It's an honor to be a part of a mission like this... that we got something like this, and that we're able to build it and fly it."

How does one reach this point of working on the space exploration of the decade? During my conversation with Trabert, she highlighted the stepping stones that brought her to this exciting place. Here's what she said:

## 1. Extracurriculars

Initially attending UoM on a full-ride military ROTC scholarship, Trabert soon discovered that this path wasn't for her. Fortunately, her new school offered a handful of extracurricular activities and programs that she immediately dug her hands into.



Trabert joined the Space Systems Fabrication Laboratory, which at the time had a project called Nanophet that flew on the microgravity plane at NASA Johnson.

"I just kinda ended up going down the rabbit hole of space," Trabert recalled fondly. At the end of the year, someone from JPL visited the group and presented rovers. "I was just like, wow, space sounds so much fun! It sounds really stressful, but it's like a high-stress high-reward kind of environment."

Trabert's new direction - aerospace - wasn't as prominent a program at UofM in terms of classes. She emphasizes, "A lot of my education had to come from the extracurricular programs that I did."

## 2. Community College classes

Growing up in small-town Idaho, Trabert's options for higher STEM study were slim. "We had three honors classes, and maybe like two AP classes when I was in high school... I don't think any of them were math related."

She found sanctuary at the local community college, where free courses taken could contribute to her high school diploma. Trabert sunk her teeth into this opportunity, taking as many math, chemistry, and physics courses as she could. "By the time I graduated high school, I already had calculus 3 under my belt," she says. "I ended up transferring 33 credits over to UofM, and started [college] being close to being a sophomore."

The advantage extends beyond credits - for Trabert, taking these core STEM classes at an advanced level in high school enabled her to master them with ease at a large university.

## 3. Art

A common concern among those pursuing STEM is how to lighten the mental load of information. To onlookers, a life of numbers and analysis may be dull and strenuous. Trabert's advice to this is simple: "Always do something fun!"

According to Trabert, the A in STEAM is perhaps the most important of any of the letters. "Essentially, what art does is it continues to make you curious. You're gonna want downtime when you work in something that's science heavy," she explains. "You need to be able to take a break, let your brain work on the problem in the back of your head, and do something that uses the other parts of your brain."

For Trabert, this "break" was supplied by a high school ceramics class. She cites, "When I got to UofM, I did not do that - and I found that it was a lot harder."

## 4. To young girls: stick with it!

One of ten girls in her graduating class of aerospace engineering, Trabert outlines her personal struggle (independent of JPL, to be clear) with being a woman in the field.

"Typically there's a lot of "oh, you're too fragile" kind of nature. You're constantly having to fight to prove yourself; show that you're capable of performing," she says. Moreover, Trabert has always been one of the youngest in the room. "When you're really young, there's a lot of stuff that's gonna get thrown at you, that won't get thrown at the same guys of your age. If you can stick it out, it'll be worth it."

# The Science of Archeology

By: Emma Hungerford



Archaeology is a field that often uses science and technology to understand the past. Remains of past human societies are studied and examined--ranging from excavating ancient ruins to analyzing ancient DNA.

Archaeology is often thought of as a history field, when it actually incorporates a good bit of science as well. Experts in geology, biology, and chemistry are essential to many studies, and the technology and methods used to gather information are heavily science-based. Some examples might be: using X-ray fluorescence to determine the elemental composition of an artifact, 3D scanning to store replicas of rare and priceless artifacts, or carbon dating to estimate the age of certain objects. Techniques and technology are ever changing in the field as well. DNA analysis has become a significantly helpful tool in helping to understand the genetics and migration patterns of ancient populations. LiDAR (Light Detection and Ranging) can now aid in identifying sites that could be hidden underneath all kinds of obstacles.

One really cool subfield of archaeology is marine archaeology. When dealing with artifacts and remains that have been in water, it is essential to understand the chemical and biological processes that could cause degradation in order to prevent that. Saltwater is very corrosive and can cause metals to degrade quickly,

which can lead to artifacts becoming brittle or even disintegrating. Organisms underwater (bacteria, fungi, and mollusks) can also attach to artifacts, which too would cause degradation. When dealing with wooden structures under water, organisms such as teredo worms or shipworms can bore into wood and cause great damage. Of course, there are also factors like natural disasters and human activity that can interfere with marine archaeology. Hurricanes, earthquakes, and tsunamis are highly destructive, and activities such as boating, diving, and illegal excavation can cause damage to underwater structures and artifacts.

Archaeology is a constantly expanding field that incorporates so many different subjects in order to better understand our past. Preservation is a major and critical part of archaeology, and if done, can make it so that future generations can learn from and appreciate the wonders of the past.

At a width of 4.5 inches, the bog turtle is reportedly the smallest in North America! These tiny reptiles thrive in wetlands and bogs with dense vegetation, thick moss, wet soil, and deep layers of mud. Bogs are extremely beneficial to not only the wildlife it inhabits, but to humans as well! They act as environmental sponges and absorb pollutants, while also preventing flooding in the area. For these turtles, bogs protect them from predators and offer the perfect places to burrow so they can cool off in the summer. The turtles utilize uncovered vegetation for incubating their eggs and basking in the sun. In perfect conditions, they can survive over 60 years! But, this unfortunately means that without the right density and humidity, these turtles have to find a new home. In the Northeast and Southeast states of America, bogs are becoming increasingly fragile and difficult to maintain. Over time, development has chewed away at these valuable environments, creating a 250-mile gap between bog turtle populations.

The IUCN Red List and U.S. Fish and Wildlife Services have declared this species federally threatened, with an estimated 2,500-10,000 turtles remaining in the wild. With industrial development and the erasure of bogs on the rise, the turtles have nowhere to run when conditions aren't suitable. Bog turtles often fall victim to roadway mortality, fragmentation, diminished water quality, growing predator populations, and especially the illegal pet trade.

Turtles are in high demand as pets, food, medication, commercial breeding, and colorful shells.



## Endangered Species Spotlight: The Bog Turtle

By: Kaley Simkins

This leads poachers to more commonly target freshwater turtles and tortoises. When bog turtles are ripped out of their habitats, their lives become extremely fragile. Additionally, freshwater turtles are known for having very cumbersome hatching cycles; even the small amount of eggs that survive hatching will not live long enough to have babies of their own.

There are many organizations in place to protect these tiny turtles, including the Nature Conservancy! TNC has stations in Pennsylvania near South Mountain with the perfect conditions for bog turtles: low-lying vegetation and muddy, wet meadows. They first acquired this land in 1989 and have been working ever since to document the locations, travel patterns, and hibernation schedules of the inhabitants. TNC also has similar projects in western Massachusetts where they study a small congregation of turtles found in hidden wetlands. Another organization, the Defenders of Wildlife, collaborates with the USDA and works directly with landowners to come up with the best plans to protect and restore their bogs.

This all may seem very out of our hands, but there is still work to be done! Limiting pesticide use and planting trees can help control erosion and keep the water clean. Being mindful of conservation in the development of land is crucial to wildlife and the environments they contribute to.

# Credits & Contacts

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Check out our website:

<https://msorret.wixsite.com/onlineclassroom/women-in-stem-newsletter>

HAVE QUESTIONS? WANT TO GET INVOLVED?  
WANT TO BE FEATURED IN A FUTURE NEWSLETTER?

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