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# EDITOR'S LETTER

## WE ARE STEM

We are back and excited to have a whole lot of fun with our STEM community!

It has been a great year to reconnect and feel the energy of this amazing home we call Utah. There has never been a better time to reflect on how to look to the future and collaborate to solve the problems that we face together.

The theme of our annual STEM Fest has always been, "I Am STEM." This year, I would like to take that to the next level and commit to, "We Are STEM." There are so many ways we can use our collective passion to build a better future.

As I look at the wonderful articles that fill the pages of this magazine, I

know STEM is a good place to start. These articles show connections between STEM and space, psychology, nursing, medicine and healthcare, forensics, art, engineering, and history. Oh, and rollercoasters! I challenge you to find even more connections as you read these articles, or as you think about STEM.

Connect with us by visiting [stem.utah.gov](http://stem.utah.gov). We'd love to know your thoughts and ideas about how we can best serve you, your children and youth, and your community—because We Are STEM. ✨

Sincerely,

Dr. Tami Goetz

Executive Director  
Utah STEM Action Center



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# IT TAKES MORE THAN EDUCATION TO GET GIRLS INTO STEM

Mentors are the missing piece that turn an interest into a career.

**BY CYNDI TETRO**

**PRESIDENT | WOMEN TECH COUNCIL**



**THREE YEARS AGO**, former Utah Governor Gary R. Herbert said we needed to have computer science classes in every Utah school by 2022.

A lot has changed since then. Kids learn to program in 7th grade, and current Governor Spencer Cox allocated \$7.5 million more to expand access to computer science for all students, especially those without access to STEM resources. The Utah State Board of Education also made digital studies a requirement for high school graduation.

This is a huge and incredible accom-

plishment that once seemed like a pipedream. Students now have more access and exposure to STEM coursework in school than ever before. The problem is students still aren't picking STEM careers—especially girls. We've filled the classrooms, but we haven't filled the talent pipeline.

That's because when it comes to choosing a career, it's not just what you know; it's what you see. And when nearly 90 percent of high school girls say they don't know a woman in STEM, it's extremely hard to picture themselves in those roles. They may have aced their program-



like to work in STEM fields by providing role models and mentors. When students start the program, 90 percent say they don't know a woman in STEM and that they don't think STEM is for them. After meeting role models and trying these careers firsthand, 93 percent say they are interested in pursuing STEM in college. Most of them already know basic coding and computer science when they arrive, but what changes their mind is a mentor—a real person who shows them what it's really like and all they can become. This interaction reverses their thinking and changes the trajectory of their futures.

ming and computer science classes, but when it comes time to choose a career, they struggle to translate that into a vision of what they can become. They need mentors to inspire them and open their eyes to the opportunities they don't know even exist for women in science, technology, engineering, and math.

To become women in STEM, students need to see women in STEM. And when they do, it transforms their path.

That's why the Women Tech Council of Utah created SheTech. The program gives girls a vision of what it's



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Every year, hundreds of girls say SheTech has transformed their lives and goals, like Angela Layton. Angela learned the basics of computers early and even signed up for computer science classes. But she was one of very few girls, and the classes were extremely difficult. After getting a 3 out of 50 on her first test, she decided she was done. But that year, she joined SheTech. There she met role models in STEM fields and talked to mentors who assured her she could do anything she put her mind to. They talked to her about her interests, their jobs, and the potential she had to change the world. They inspired her to keep going and not give up. At the same time, she connected with hundreds of other girls who were interested in the same things she was. With this new support structure and cheering squad, Angela decided to keep going.

A few years later, Angela became the state Sterling Scholar in computer technology. She created an app that won the Congressional App Challenge. Now she's a sophomore at the University of Utah studying computer science. She still faces challenges, and her courses are as demanding as ever, but the mentor and role model connections she



made in SheTech still motivate and support her to keep going.

Congratulations to all the educators and policymakers who have made computer science a more integral part of the classroom than ever before. This is giving students skills and information unknown in previous years. But to help students—especially girls—choose STEM pathways, they have to see what they can be beyond their school setting. Give students this vision and help them discover their futures in STEM. You'll change the trajectory of their lives in a way they (and you) could never have imagined. ✂

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# IT TAKES STEM TO ENGINEER A ROLLER COASTER

Here's how.

**BY DUSTIN ALLEN, P.E.**

**DIRECTOR OF ENGINEERING | LAGOON AMUSEMENT PARK**



**ON JULY 2, 2015**, Lagoon Park in Farmington, Utah, opened the gates to the park's newest attraction: "Cannibal." It's a unique roller coaster like nothing else in the world, and the ride quite literally changed the landscape of the park. The tallest structure in the area, with an enclosed lift tower reaching over 208 feet, and highlighted by a bright red track with a more than vertical drop, sweeping loops, an underground tunnel, and a 60-foot tall artificial waterfall, the ride was breathtaking (figuratively, and literally on that first drop!) when completed.

At a cost of over \$26 million, "Cannibal" was the biggest investment the park had made to date. The park hoped that the many years of design, engineering, construction, and testing would pave the way for an outstanding ride, and today, seven years and more than 8 million riders later, those who had a hand in the development of the ride can safely say that it has been a huge success!

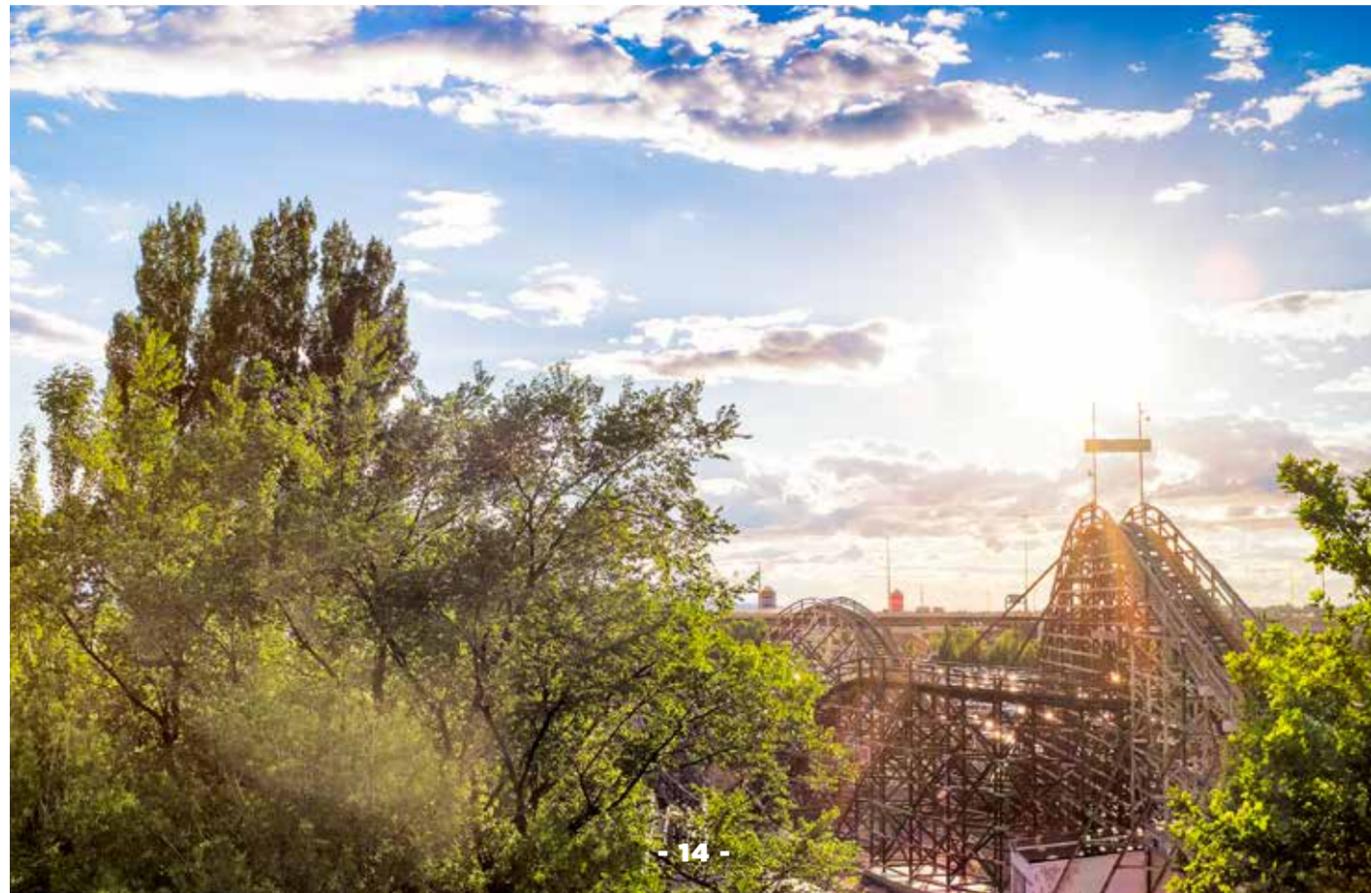
Though a must-ride attraction like "Cannibal" involves numerous people (many within STEM careers) and an incredible amount of work, the building blocks of roller coaster

design are STEM principles. Every roller coaster starts with an initial design concept. The concept lays out the geometry of the track in very broad strokes and is normally based around a few key elements: the lift, the brake, and the maneuvers.

The lift is the portion of the ride at the beginning that gets the vehicle to the elevated state, after which the vehicle is allowed to run down a fixed track. There are many ways to get a vehicle to a high point. Lagoon has many examples of different types of lifts on the rides. "Roller Coaster," built in 1921, uses chain and sprocket technology.

"Bombora" uses an electric motor pinch wheel system. "Wicked" uses a magnetic launch system. "Cannibal" uses a cable-driven lift system. Each system is designed and engineered based on basic physics and mathematics principles.

The brake element is the portion of the ride at the end that brings the vehicle to a slow or stop in order for riders to unload the vehicle. Some of the same physics and mathematics principles used in lifts are used in the brakes. For example, magnets and motor pinch wheels are very typical brake systems.



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Though the lift and brake portions are essential bookends to a ride (and as is the case with “Cannibal” or “Wicked,” these elements can be a feature of their own), the real fun and the real focus of the ride are in the maneuvers. What happens after the vehicle leaves the top of the lift is what makes a roller coaster a truly unique experience.

Acceleration (the rate of change of the speed of an object) and force (push or pull on an object) are the foundation of roller coaster design. The relationship between these two is as simple as Isaac Newton’s law, which states that Force = Mass x

Acceleration. The effect of mass and acceleration is force. In coasters, since the mass does not change in the course of the ride cycle, roller coaster tracks are designed to change the accelerations, which results in forces upon the rider.

The layout and shape of the track between the lift and brake help dictate the relationship between acceleration and force. In coaster jargon, anything that changes the force on a rider is called an element. One example in the ride track is a valley element. This shape, a smiley face, combines the acceleration of gravity and centripetal acceleration to

cause a force on the rider. The rider will feel this as being pushed into their seat—sometimes as much as four times the weight of the rider (i.e., 4 Gs) or more.

Another example is a hill. In this shape, a frowny face, centripetal acceleration can cancel out the acceleration of gravity and result in no force on the rider. This is also called weightlessness (i.e., 0 Gs). Taking this a step further is the element of a vertical loop. In this case, there is no resulting force (centripetal and gravity accelerations cancel), and the rider experiences being upside down in weightlessness.

There are many other ways to change the geometry of the track in order to generate different forces on the rider. Stringing many of these different elements together gives a ride its characteristics. All of these elements are based on physics. The different elements laid out together provide the initial design concept and lead to what can ultimately become a must-ride attraction.

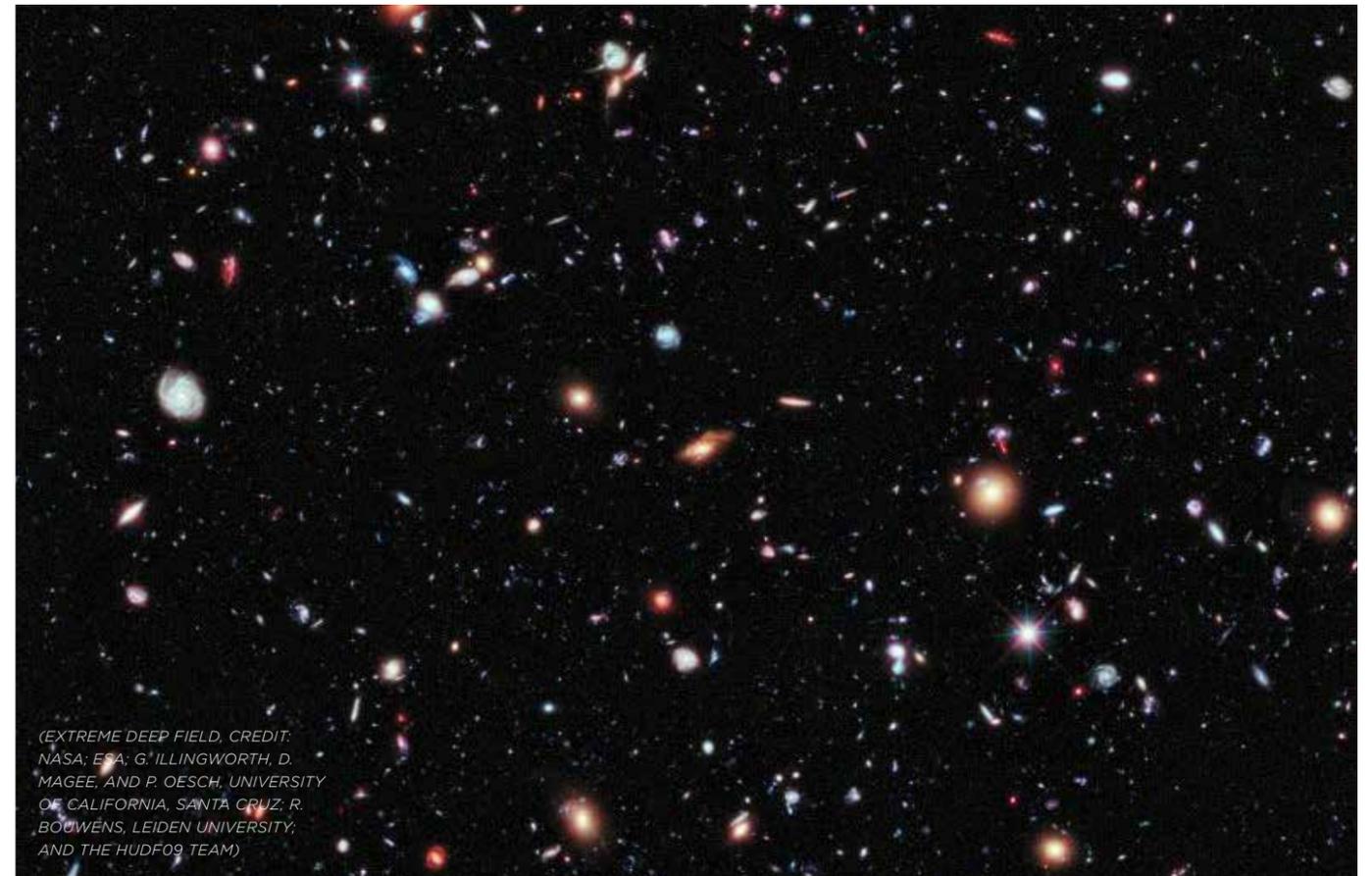
With STEM knowledge, including basic physics, one can do truly amazing things. One can create one-of-a-kind experiences and never-before-seen elements. One can, in fact, design a roller coaster. ✨



# USU ENGINEERS HELPED BUILD NASA'S NEWEST "TIME MACHINE"

And use applied STEM skills to overcome obstacles.

BY EMILY LEHNARDT, MS  
NASA SOLAR SYSTEM AMBASSADOR



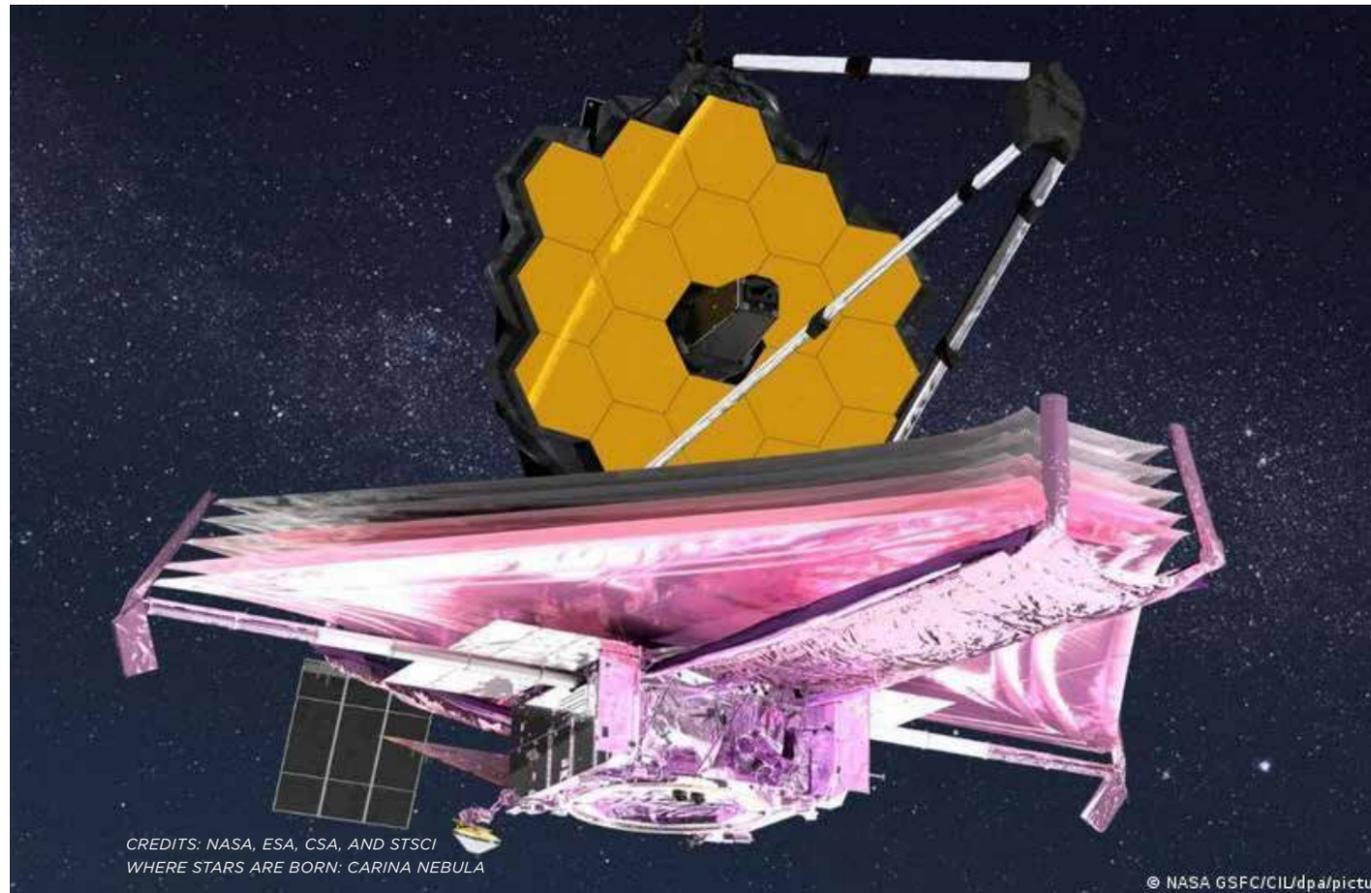
(EXTREME DEEP FIELD, CREDIT: NASA; ESA; G. ILLINGWORTH, D. MAGEE, AND P. OESCH, UNIVERSITY OF CALIFORNIA, SANTA CRUZ; R. BOUWENS, LEIDEN UNIVERSITY; AND THE HUDF09 TEAM)

**THIRTY YEARS AGO**, NASA astronauts were on a mission to repair a very extraordinary mirror in space. This mirror was aboard the Hubble Space Telescope (Hubble) orbiting Earth 340 miles above us. Hubble was sent to observe planets, galaxies, and beyond. However, shortly after the first images arrived from Hubble, scientists around the world noticed the images looked blurry.

It was soon discovered the shape of the primary mirror was engineered incorrectly. The engineering mistake was no bigger than the width of a human hair, but the consequences were profound. Fortunately, NASA

used problem-solving and creativity to aid astronauts in repairing the Hubble. Shortly after the repair, Hubble's images were crisp and perfect. Eventually, Hubble captured one of its most famous images, Ultra Deep Field View. This image displayed the most distant galaxies ever observed!

Scientists like Dr. Eric Smith said on "Countdown to James Webb Space Telescope" that the Ultra Deep Field View image inspired NASA, and its global partners, to deepen their resolve to engineer Hubble's complementary companion, the James Webb Space Telescope (Webb).



Determined to collaborate with others, an important STEM skill, NASA contacted Utah State University's Space Dynamics Laboratory in Logan, Utah. Chief engineer Glen Hansen and his team answered the call to engineer a thermal control system. He also called upon USU students to engage in real-life STEM opportunities to design, analyze, and develop solutions in collaboration with NASA's Goddard Space Flight Center.

Together, the scientists and engineers built a successful thermal control system enabling Webb to collect 13-billion-year-old primor-

dial light. Hansen contributes their success to STEM skills and patience. "Successful STEM practices also require patience," Hansen states.

NASA is no stranger to patience. STEM skills such as improving and revising designs require patience. In fact, Webb was scheduled to launch in 2007, but it was delayed many times because engineers had to improve and revise designs. For example, 70 screws on the Webb became loose during a "shake test." Scientists and engineers revised their engineering designs many times to fix problems like this one. Finally, on December 25, 2021,



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CREDITS: NASA, ESA, CSA, AND STSCI  
WHERE STARS ARE BORN: CARINA NEBULA

Webb was launched into space and now orbits 1 million miles (1.6 million kilometers) away from Earth.

On July 12, 2021, Webb's first images were unveiled to the world. From Webb's image of a star nursery in the Carina Nebula to capturing distinct signatures of water on the exoplanet WASP -96b, scientists and engineers were overjoyed with the results.

Despite delays and revisions, NASA and its partners patiently applied STEM skills to overcome their obstacles. Scientists and engineers used collaboration, problem-solving, and

creativity to construct Webb, an engineering marvel.

Now, astronomers like Professor Zheng Zheng at the University of Utah will study these images to answer questions such as "How do galaxies form?" and "Are we alone in the Universe?" The Webb images will not only assist astronomers in uncovering the secrets of the universe but also inspire and teach the next generation in STEM.

Come along with Webb as it explores the universe and inspires the next generation of scientists: YOU! ✨



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Energy jobs in Utah pay, on average, three times what jobs in other industries pay. This is possible because Utah is a national leader in energy research, innovation, and workforce development. OED has partnered with the Utah Science Teachers Association (UtSTA) to provide more than 35 energy lesson plans that meet state SEEd standards. This curriculum is available for free at [energy.utah.gov/curriculum](http://energy.utah.gov/curriculum).

OED also sponsors teacher training events that walk through the energy curriculum. These professional development opportunities include lunch, lesson supply kits, substitute costs, and re-licensure credits. In 2019, OED created the Energy Educator Award to recognize teachers for excellence in science and energy education. Four teachers have since been honored with a \$500 award.

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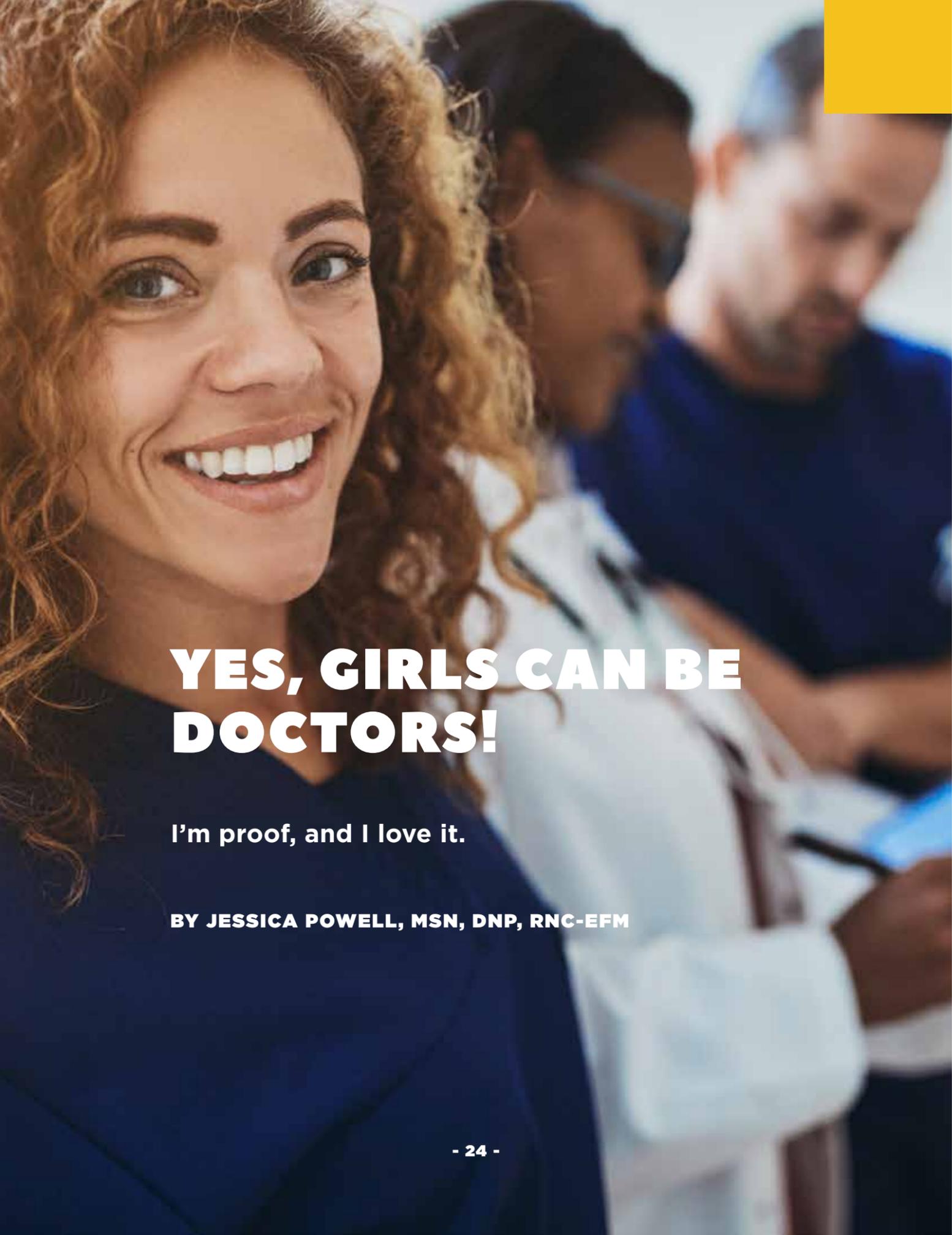
In partnership with Chevron, OED has provided over \$135,000 in scholarships to students pursuing STEM education at Utah institutions of higher learning since 2016. This includes colleges, tech/trade schools, and universities. If you are a high school senior or first-year college student interested in applying, please visit [energy.utah.gov/scholarships](http://energy.utah.gov/scholarships)



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# YES, GIRLS CAN BE DOCTORS!

I'm proof, and I love it.

BY JESSICA POWELL, MSN, DNP, RNC-EFM



**I HAVE BEEN A NURSE** for 21 years, during which time I have practiced as a labor and delivery nurse and a unit educator. I now teach at a university.

When I was five years old, I was asked what I wanted to be when I grew up. I answered that I wanted to work in medicine as a doctor. A little boy in my class looked at me like I was crazy and said, "Girls can't be doctors." That moment in my young life cemented my desire to be a doctor and prove everyone wrong, especially that little boy.

Florence Nightingale is considered

the founder of modern nursing. She understood and applied science, math, and statistics techniques to improve the quality of patient care in the mid-1800s. Her ideas and discoveries eventually became the foundation of nursing today. Inspired by Florence, I wanted to prove that girls could be anything they wanted to be. I had a direction but didn't know my exact destination.

In high school, I participated in a healthcare career internship program where I observed various healthcare roles. My favorite placement was on a local labor and delivery unit. I observed physicians,



now I knew. I wanted to make a difference in patients' lives by helping them through some of their worst and best days.

I attended Brigham Young University for my undergraduate degree. Nursing school requires a lot of dedication and many science courses. I was and am still a nerd for a new textbook; I love the anticipation of learning something new within its pages. Nursing prerequisite courses include chemistry, biology, anatomy, microbiology, math, psychology, and pathophysiology. It's important for a nurse to understand how the human body works and what hap-

nurses, and anesthesiologists as they cared for women giving birth. I went into the internship very sure I wanted to be a physician but left having completely changed my mind. I saw the differing roles physicians and nurses played in the care of patients. Both were valuable members of the healthcare team, but I became fascinated by the intimate role nurses played in the experiences of their patients. The passion each nurse had for their patients and practices was palpable. Until that internship, I hadn't been able to put into words exactly why I wanted to work in healthcare, but



pens when the body is not working well. My favorite classes were anatomy and pathophysiology because I enjoy understanding how our bodies work.

I began my first nursing position in labor and delivery. It is a fast-paced, high-risk environment where nurses have a lot of autonomy and work very closely with the healthcare team. I wanted to learn everything I could about my role. I took fetal monitoring interpretation classes and fetal resuscitation courses, and observed my experienced peers to enhance my skills. My love of learning prompted me to become the unit educator for the same unit I had been working on. In this role, I was responsible for educating nurses and ancillary personnel (staff working under a licensed practitioner). This included training new employees and keeping current employees updated on new research and practice changes. Nursing as a profession conducts quantitative (numerical data) and qualitative (data explaining the numbers) research to find the best ways to care for our patients. As a nurse educator, I helped bridge the gap between published research and application at the bedside.



I enjoyed educating so much that I decided to obtain my master's degree in nursing education and my Doctor of Nursing Practice degree. I can guess what you are thinking: "That is way too much schooling." It was a lot, but because I was learning concepts that I could directly apply to my educator role and bedside practice, it made it very rewarding.

The world is changing and adapting all the time, and so is healthcare. COVID demonstrated the importance of being flexible and innovative in response to medical needs. Nurses play an essential role in meeting the healthcare demands of our diverse populations, and the profession is a fantastic way to make a positive change in the world. ✨

# FORENSIC SCIENCE HELPS US FIGHT CRIME

Biology, math, statistics, and computer coding combine to make our world safer.

BY CHI-TAI TANG, PHD

UTAH DEPARTMENT OF PUBLIC SAFETY | BUREAU OF FORENSIC SERVICES



**I STROLL INTO THE** building on a Sunday afternoon. It's quiet in the office, and there are none of the distractions that occupy a normal workday. This week I will have a Zoom meeting with a prosecutor for a case I worked on. I need to prepare for the meeting and review my notes, as the case is three years old. The trial starts at the end of the month, and the prosecutor has questions about the scientific report I wrote for the court. I will testify in front of the jury to represent my findings.

But instead, I sit in my chair and log into the FBI workstation. This is my favorite part of my job as a manager

of the forensic biology lab for the Utah Bureau of Forensic Services (UBFS). I am excited to see new messages from CODIS, the Combined DNA Index System. These updates can produce critical clues for detectives looking for an unknown suspect of a committed crime.

Obtaining the identity of the unknown suspect requires a seamless process involving several teams at the forensic biology lab. It starts with forensic serologists who attempt to locate and identify any body fluids—e.g., blood—left at a crime scene. Body fluids can confirm the commission of the crime. Body



form local and national law enforcement agencies of any hits to the known offenders in CODIS.

In addition to forensic biology, UBFS offers services in chemistry, latent prints, and firearms. Therefore, a career in forensics may require the type of multidisciplinary approach that STEM is best suited to provide. A forensic biologist possesses an education with a strong emphasis on the natural sciences, but forensic biology relies upon a multitude of disciplines in practice. For example, serological tests are simple chemical reactions that produce changes in color in the presence of body

fluids also contain a high amount of DNA, the genetic material of life, and an individualizing biological signature. Any sample with a body fluid will be transferred to the DNA lab team, who, with the help of robots, processes the DNA into a readable format. That data is interpreted by a group of DNA analysts. The DNA profile of the evidence is often represented by more than one person, so the DNA interpreter will attempt to tease apart the mixture into individual profiles. The probative DNA profile will be handled by the CODIS team, who will search a database of known convicted offenders. We in-



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fluids. Moreover, the modern era of forensics will demand a more versatile education. Huge advances in forensic technologies like fluorescent dye chemistry, advanced statistical models, and complex computing algorithms necessitate students who are well-rounded in math, statistics, and computer coding.

My own path to forensic biology veered from the conventional route. I majored in biology as an undergraduate at the University of Pennsylvania. I initially pursued academic research and earned a PhD in plant molecular biology at Rutgers University. I then headed

off to Dallas as a postdoctoral candidate at UT-Southwestern Medical Center to study circadian rhythms, or the day-night cycles our bodies experience. After that, my career pivoted as I began learning forensic serology at the Florida Department of Law Enforcement. I joined UBFS three years later for training as a forensic DNA analyst.

I think the arc of my career highlights two main points: the first being that a strong knowledge of basic science makes accessible a wide variety of possible careers in science. If my foundation for science was not strong, I could not transition and

be successful in multiple fields of biology. The second point is most forensic labs will invest heavily in resources to train new forensic scientists. This affords an opportunity to introduce forensic science to the candidate, bolster their knowledge base, and properly demonstrate how the forensic lab performs its duties. I certainly benefited from the training programs as I learned the process of forensic testing and other aspects that were foreign to academia.

Forensic science is an exciting and dynamic field in which impact is driven by new scientific and technical advances. Training continues



throughout a forensic career, and forensic scientists continue to develop new skills. The biology section at UBFS has addressed these dramatic changes by creating a team with the sole purpose of introducing these new technologies in the lab. By doing so, we hasten the implementation of the most up-to-date tools for fighting crime and demonstrate the power of science in creating a safer world. ✿



# ARE YOU RIGHT-BRAINED OR LEFT-BRAINED? WRONG!

STEM and the arts are not opposites.

BY CHRIS PETERSON  
PRINCIPAL | CHRIS PETERSON STUDIO



**ARE YOU MORE OF** an “artsy” person or a “science-y” person? Does your answer to this question influence your class and college choices and the career path you are charting?

On paper, it’s pretty easy to separate science, tech, engineering, and math from the arts and humanities. In fact, when you ask most people, they’ll tell you STEM has nothing to do with the arts. Artists and scientists operate on opposite ends of the spectrum—abstract vs. practical, emotional vs. analytical, left-brained vs. right-brained, right?

I’m here to tell you that’s some old-fashioned thinking. It’s also a logical fallacy to set the two “disciplines” apart as opposites when their relationship is not so simple or separate.

First off, the left-brained vs. right-brained myth—upon which most of our mistaken logic rests—has been debunked by brain scientists. Brain activity in one cerebral hemisphere or the other is correlated much more to the activity being performed than to the genes you’re born with.

So if you’ve ever asked yourself, “Am I a right- or a left-brained per-



son?” The answer is that you are both. You need both sides for all the many amazing things you do. Your brain has the capacity for complex analytics and beautiful poetry alike. Simply put, we all have the potential for both incredible creativity and complex calculations.

I believe we all are born with this great potential for creativity, but “normal” social processes somehow stifle it for many of us. When I taught elementary art many years ago, I observed something fascinating. The artwork by K-2 students was consistently better than the artwork by 3-6 graders. Not better

*craftsmanship* than the sixth graders, but better, more creative art in general. I saw more unique thinking and lots more ideas out in the stars. Imagination unleashed, so to speak.

Something shifted for those 2-3 graders as they developed peer groups. Those students without exceptional drawing ability—which was the majority of them—basically copied each other, and the result was a cookie-cutter approach. Many assignments were well executed, but much fewer breakthrough ideas emerged over the year.

I tell you this story for two reasons. First, I believe it reinforces my earlier assertion of an essential creative instinct that all humans possess. Every one of those kindergartners was tapping into some pure creativity.

Second, it illustrates that many of us somehow lose this along the way. We decide that we either are or aren’t artistic. Some of us decide we are artistic and pursue it; others don’t. That’s where the right brain vs. left brain myth comes in. It was conventional knowledge for decades, and created this artificial division between types of human activities and led many of us to choose career paths based on a key faulty assumption. I can recognize in

hindsight that this myth has subconsciously affected my education and career path.

Today, I’m an artist: a mixed-media painter of murals and wildlife paintings. I use all kinds of media including acrylic, oil, collage, aerosol, epoxy resin, and more to make art. Each material requires some specific knowledge, tools, and practice, but the combination of each media creates new possibilities not achievable with just one medium.

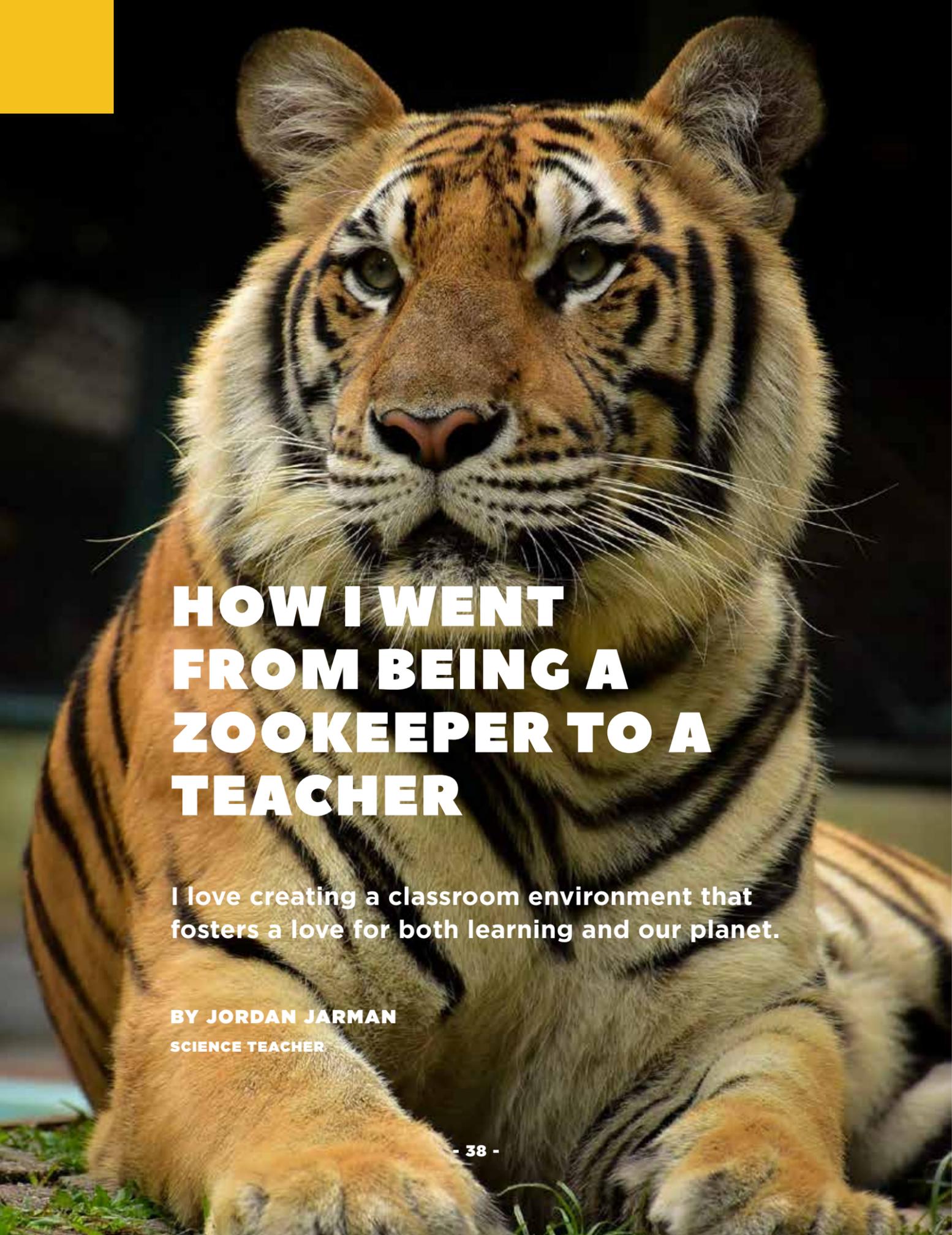
In elementary school, I confess that I was not one of those students with outstanding “natural talent.” I’ve never been very good at drawing realism. I didn’t find my real love of art until my 20s and the ability to make a living doing it until my early 40s.

My competitive advantage as an artist is my use of technology and multi-disciplinary knowledge at various places in my process. I employ graphic design software on my Mac and iPad to design and visualize concepts for clients. I use various other tools like LCD projectors and grids for transferring rendering concepts onto large walls and canvases for installation. Math is used in material calculations, and engineering is used in heavy equipment on big walls. A deep knowledge of envi-

ronmental and life sciences is at the philosophical root of my creative work. I will also say that maintaining a creative practice has the added mental health benefit of therapeutic stress relief for me.

In conclusion, I don’t think of STEM and the arts as opposites. They are related. Think instead about a multi- or cross-disciplinary approach to your education and career. This is uncharted territory for breakthroughs and innovation. You have the brain capacity to excel in both STEM subjects and the arts, and the cross-fertilization of ideas between sectors will spur tomorrow’s breakthroughs. ✨





# HOW I WENT FROM BEING A ZOOKEEPER TO A TEACHER

I love creating a classroom environment that fosters a love for both learning and our planet.

BY JORDAN JARMAN  
SCIENCE TEACHER



**MY JOURNEY INTO** teaching science was a bit different than most. I received my Bachelor of Science in integrated studies through Utah Valley University with an emphasis in biology and psychology. Before becoming an educator, I worked at multiple zoos and aquariums for about eight years.

During my time in college, I regularly volunteered for anything that related to animals. Animal conservation has been my passion since childhood. I will never forget watching “The Crocodile Hunter” as a kid and thinking, “I want to do that.” Now I’ve worked with a wide variety of animals, from freshwater

fish to tigers, fulfilling a dream that couldn’t have come true without the help of multiple departments and organizations that strive to protect our natural world.

While working at multiple zoos and aquariums throughout the United States, I had the opportunity to work in the education and husbandry (caring for animals) departments. The zookeeping world is a small one, and I still stay in contact with friends that have moved all over the US—and even some outside the country—giving me access to a community of knowledgeable friends and professionals.



Support Team. This team is constantly working with all the pumps, making salt water, analyzing water chemistry, creating animal habitats, and moving millions of gallons of water around the building. Without the Aquatic Life-Support Team, there is no aquarium! It's incredible the things that they can make and do. These are just a few of the essential teams that keep an aquarium healthy.

If you think the zoo or aquarium world might be for you, there are lots of opportunities to check it out and get involved. Volunteering at any local animal nonprofit will help you to gain skills and experience and meet people in the field. Creating connections in a close-knit field can help you figure out if this is what you want to do and help you find opportunities. Some local organizations that offer great opportunities are the Loveland Living Planet Aquarium, Hogle Zoo, HawkWatch International, or even your local animal shelter. Utah is a great place to get involved because we have many conservation groups based here.

People always ask me if I miss working at a zoo or aquarium. My honest answer is yes, but at the same time, dreams change, and that's ok. I'm

While in animal husbandry, I constantly studied fish anatomy and behaviors while determining if an animal was in good health. One of my favorite aspects of working with animals was how every day was different. There was never a true routine.

Besides husbandry, there are so many other jobs that are needed to keep an aquarium running that also require STEM skills—like those who work in fabrication. The fabrication team helps build all the displays and create interactive exhibits throughout the building. Another key component in keeping an aquarium up and running is the Aquatic Life-

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lucky enough to be a mom to two crazy girls and the zoo world didn't fit my lifestyle. Getting into teaching is a path I have always considered and have greatly enjoyed. Not only do I get the chance to talk about how incredible biology and zoology are, but I also get the chance to share that knowledge with the next generation and get them excited about it.

Creating a classroom environment that fosters a love for learning and a love for our planet is something I am always working toward. My fellow science teacher and I run our school's Science Club. Within this club, we've had the opportunity to help students raise money for local nonprofits, help in citizen science projects around the Salt Lake Valley—like FrogWatch USA, Utah Lake Water Quality Study, SLC Neighborhood Naturalists—and get students involved and connected to STEM resources that they can access on their own or use as a resource after high school.

Science doesn't have an age limit. Anyone can get involved. Working in both the zoo and teaching worlds has given me a great sense of purpose and fulfillment. Every day as a science educator is different than

the last. I am constantly grateful for the opportunity to talk about a subject I have an immense passion for and share this passion with my students. While I might not be as hands-on with animals anymore, I'm still helping protect animals and the natural world and inspiring others to do the same.

"If we can teach people about wildlife, they will be touched. Share my wildlife with me. Because humans want to save things that they love."  
-Steve Irwin 🦘



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