

S T E M

Savvy

VOLUME V

5414

SPRING 2024

INTERVIEW

Learn about a Chemical Engineer

COMIC

Safety First!

DIY ACTIVITY

Learn how to make a lip balm at home

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Gearbox Girls &
FRC Team 5414 - Pearadox

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GIRLS IN STEM

Science Technology Engineering and Math

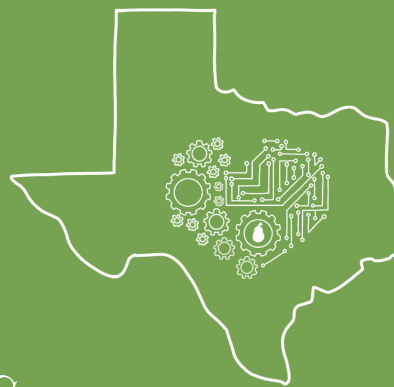
VOLUME 5

CHEMICAL ENGINEERING ISSUE

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ABOUT US



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This magazine seeks to fill a niche role being neglected by most magazines. We want to give adolescent girls access to a magazine that helps their interest in STEM.

Cheers,
Gearbox Girls
& Pearadox FRC 5414



Amelia Theroff, a senior, has held numerous leadership roles on the team. Currently, she is co-captain and the drivetrain subsystem lead. She plans to study mechanical engineering at Texas A&M University.

Student Interview: Amelia Theroff

By: Aliderly Sanchez, Pearadox Student

Q: Do you have any advice to give girls?

A: I would tell girls to find what they are passionate about because when you find something you love you find yourself going out of your comfort zone and putting in the extra effort and time just because you love it so much. You'll grow so much and accomplish things you never thought you could do because you're willing to go the extra mile for things you are passionate about. I have honestly surprised myself multiple times by how much I pushed myself to do things I would normally never do while on the team.

Q: Why did you choose to be in robotics?

A: I chose to be in robotics because I've been fascinated by STEM and robots ever since I was young. I still remember that moment I decided I wanted to go into STEM and robotics. When I was probably 8 or 9 years old, my family went to visit Space Center Houston, and they were having a small robotics competition there with Sphero robots, nothing like FIRST at all, but when I saw it I was immediately fascinated by it, I actually made my mom sit with me and watch it while my dad took my other two sisters around the space center because I didn't want to leave. As we were watching, my mom pointed out to me that there was a girl competing. I hadn't noticed it before, but out of the whole competition there was only one girl. Immediately when I saw her it was like something lit up in my brain. I decided right there and then that this is what I wanted to do for the rest of my life, that one day I was going to be just like that girl. I still have that same determination today and have developed a strong passion for STEM. That's why it's important to me to inspire other young girls like I was inspired.

Q: What impact has robotics made in your life?

A: Robotics has completely changed me; I hardly recognize myself anymore. I used to be so quiet and nervous around others and now I am so much more confident. I have met so many amazing people and have made some real friends that are interested in the same things I am. I've learned what it's like collaborating, communicating, and working with others as a team. It's a lot more difficult than I thought it was, but the skills I've gained on the team I will use for the rest of my life. Because of robotics, I can now say I have done many things that I'm proud of and my passion for STEM has only grown.

Dr. Kimi Bourland

By: Aliderly Sanchez, Pearadox Student



Dr. Bourland earned her Ph.D. from the University of Texas and currently works at Sparx Engineering. She is also an alumna of FRC team 1619, Up a Creek Robotics.

Q: What is your job and what do you do in it?

A: I work for Sparx Engineering, a small consulting firm, as a chemical engineer. Which means I actually work in a laboratory system in our building. Actually we have two locations, in Houston and Dallas, and we have industries come to us for help with various problems. They might not have the infrastructure or the people to do what they need, and so we provide consulting support.

Q: What does a chemical engineer do?

A: A chemical engineer examines the process of taking a chemical or procedure and determining how to either increase its scale or optimize it for economic viability within a corporation. The goal is to maximize profits and ensure that consumers receive the most value for their money.

The concept is that a chemist may develop a novel chemical or polymer, and then we examine how to transition from our raw materials to the final production stage. Additionally, we explore how to adapt chemicals, processes, or materials to address real-world problems.

Q: What are some significant challenges you've encountered in your current role?

A: A significant challenge I faced during my studies was that I became dissatisfied with my current university, so I decided to transfer back home where I had a stronger support network. There, I founded a sorority for women in engineering because I realized the importance of having a group of female peers to uplift and empower me. It was crucial to have a safe space where I could address issues with colleagues or fellow students and seek support when needed. In my PhD program, I found that my lab setting wasn't conducive to my goals and ideas, so I switched to another group. Despite this transition, I was able to graduate on time and felt empowered and supported by both my institution and my new lab mates.

Q: Speaking of women in stem how is it like being a woman in stem?

A: Being a woman in STEM has be-

come easier over time. My grandmother was one of the first female chemists at Stafford Chemical, and my grandma often shared the story of her first day at work, where she noticed nudist posters in the locker room. She took immediate action, and the posters were gone the next day. I believe my life has been somewhat easier because of her pioneering efforts. I've discovered that having mentors or supportive friends is essential. They don't necessarily need to be female, although it certainly helps. Having mentors who can offer guidance during challenging times or simply reassure you that you're doing great is invaluable when you're breaking the mold in STEM.

Q: What is some advice you would give to girls, or woman in general, who plan or want to work in stem?

A: One piece of advice I would offer to girls or women interested in pursuing careers in STEM is to prioritize building a strong support network. Without the support of my family and friends, I wouldn't have achieved what I have today. I still keep in touch with many of my sorority sisters and college friends, some of whom were even bridesmaids at my wedding. Their encouragement and support empower me to face each workday with confidence. Whether it's someone you work with, a close friend, or your partner, having a support system you can rely on is crucial. It's essential to have at least one person you can turn to after

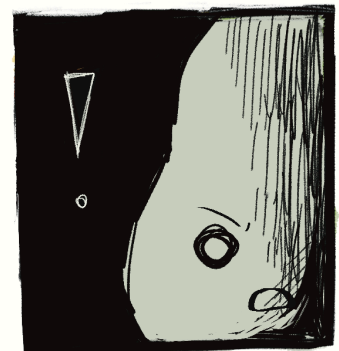
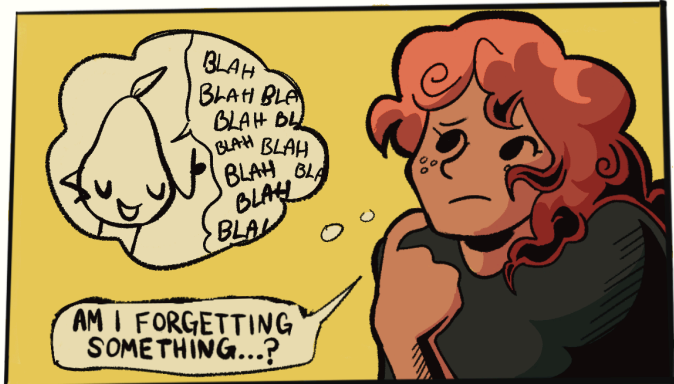
a rough day, as having a good support wedding an stuff, and without them I wouldn't feel empowered or emboldened to go back to work every day, so, having a group, it doesn't have to be who you work with, but it always helps to have at least one friend there, but even just someone you can call if you've had a rough day, it can be your partner, whoever it is just having a good support group is absolutely essential to doing anything.

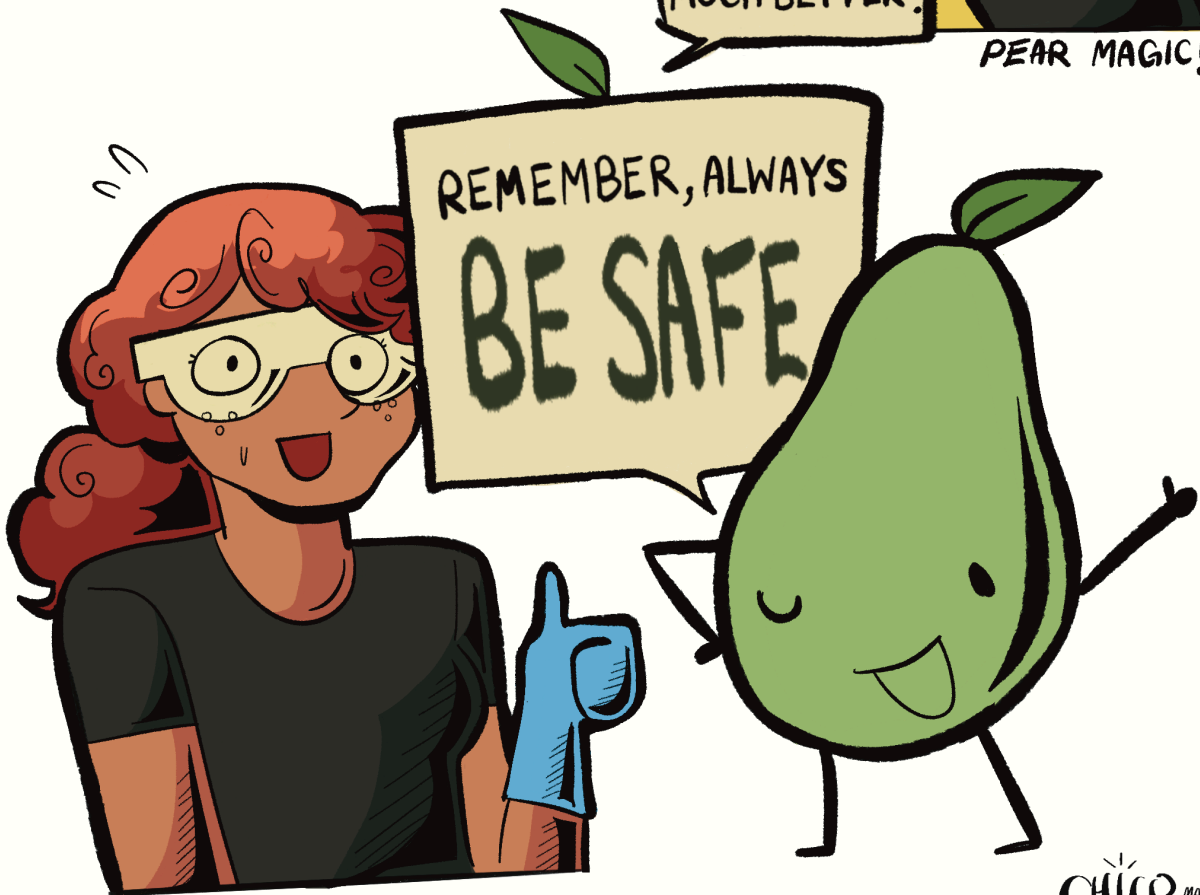
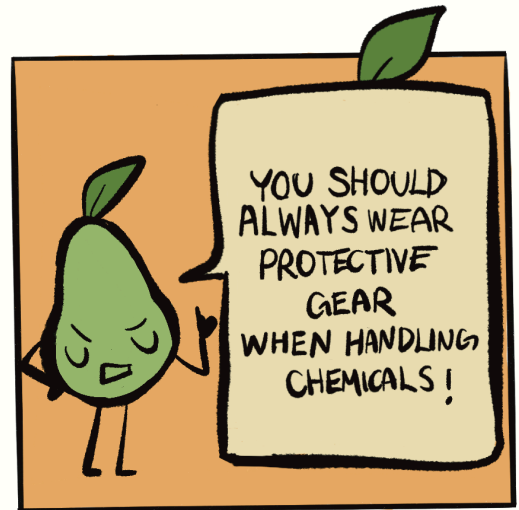
Q: What inspired you to work in chemical engineering?

A: My journey into chemical engineering was inspired by various experiences. It all started with my childhood fascination with building and creating, particularly with playing Legos. My mom encouraged my interest in STEM fields, noticing my aptitude for math, which naturally led to an inclination towards engineering. Joining an FRC robotics team, specifically Team 1619, during high school further solidified my passion for engineering. However, it wasn't until college when I took my first chemistry class that I truly fell in love with the subject. Discovering the field of chemical engineering merged my interests in engineering and chemistry seamlessly, providing me with the perfect blend of both worlds. Since then, I've been fully committed to this path and haven't looked back.

PEARYS LAB SAFETY ADVENTURE

By: Gabriella Chico, Pearadox Student



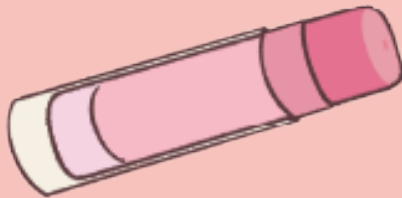


HOW TO MAKE...

STRAWBERRY LIP-BALM



By: Keira Curow, Pearadox Student



WEAR SAFETY GOGGLES!

STEP 1

Put beeswax and shea butter in a microwavable container in the microwave



STEP 2

Once melted add coconut oil and 2-3 drops of strawberry essential oil



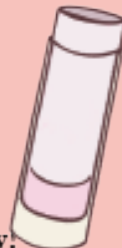
STEP 3

Add desired color in the mixture while it's still liquid (OPTIONAL)



STEP 4

Mix well and transfer the mixture into a Chapstick tube or small container



STEP 5

Let cool for 30 minutes then enjoy!



HOW TO MAKE...



THE MICRO-WAVE EDITION!

Pearadox

- 2-3 drops of strawberry essential oil
- 1 tablespoon of shea butter
- 1 tablespoon of beeswax
- 2 tablespoons of coconut oil
- Chapstick or small container
- Safety goggles/glasses
- Gloves (Latex)
- Red/Pink food color (optional)

Total 5414

MATERIALS

pearadox

▪ Same Materials!



HOW TO MAKE...

THE STOVETOP EDITION!



STEP 1

Put a bit of water in a small pan on a double boiler and place it on the stove on low-to-medium heat



STEP 2

Put beeswax and shea butter in the cup to melt

BEESWAX

STEP 3

Add coconut oil and mix well



STEP 4

Take liquid off heat once melted and place in a little strawberry essential oil



STEP 5

Add desire color in the mixture while it's still liquid (OPTIONAL)



STEP 6

Mix and transfer mixture into a Chapstick or small container

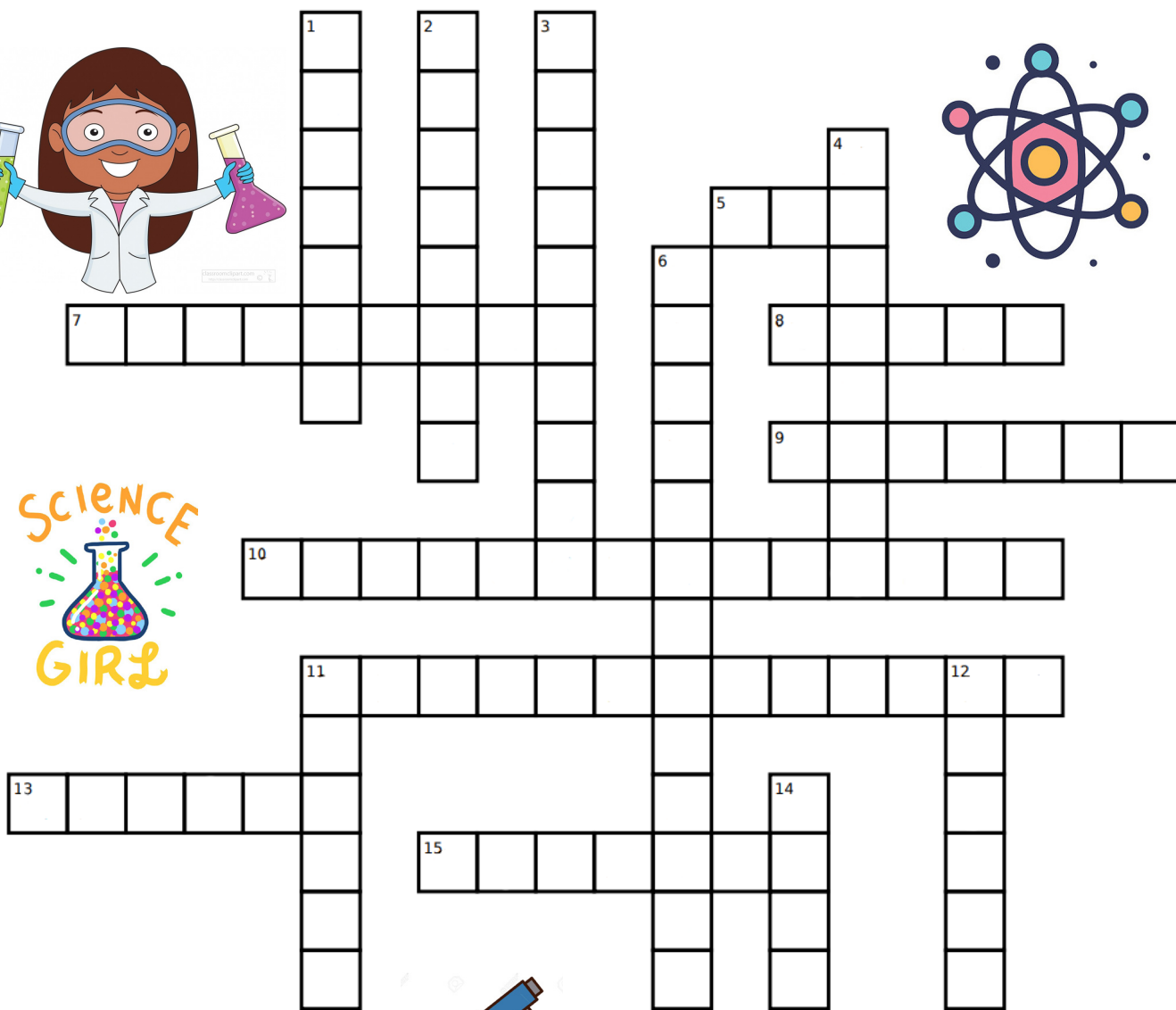
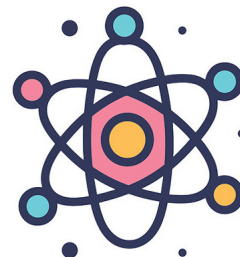


STEP 7

Let cool for 30 minutes then enjoy!



CHEMISTRY CROSSWORD PUZZLE!



Across:

5. Frozen form of water
7. Stored energy in an object
8. H₂O
9. Energy of an object in motion
10. The way plants make food
13. Anything that has mass and takes up space
11. Arranges elements into rows and columns
15. A person who works in chemistry

Down:

1. Cannot be broken down into a simpler substance
2. Vertical columns on the periodic table
3. Has properties of metals and non-metals
4. The charge of the atoms in the electron cloud
6. CO₂
11. Horizontal row on the Periodic Table
12. Solid, _____, and gas
14. The basic building block of chemistry

Princesses with Power Tools

By: Sofia Vera, Pearadox Student

Princesses with Power Tools (PWPT) is an event held by Pearadox that encourages young girls to pursue STEM as a hobby or future career. On November 10, 2023, Pearadox held their 3rd Annual PWPT event with 23 girls in attendance, ranging from ages 8-10. A group of Pearadox members who are dedicated to erasing the stigma that discourages women from pursuing STEM careers were the ones who planned and held the event. In addition, we had 6 professional female engineers volunteering at the event. One of these volunteers is an alumni who now works at NASA as an engineer, plus she was the inspiration for the first event!



The girls were shown how to use drills and other power tools, even though the girls were intimidated by the responsibility that came with using large power tools, they all upheld the safety requirements and enjoyed being able to learn about these daunting tools.



"I always thought that princesses couldn't do anything cool, so I didn't like them, but these girls are dressed like princess and they're awesome!," said one of the attendants after the event was over. Overall, the event ended up being a huge success with many girls leaving the event with a new mindset when it comes to women in STEM.

CROSSWORD ANSWERS!

- Across:**
- 5. Ice
 - 7. Potential
 - 8. Water
 - 9. Kinetic
 - 10. Photosynthesis
 - 13. Matter
 - 11. Periodic Table
 - 15. Chemist

- Down:**
- 1. Element
 - 2. Families
 - 3. Metalloids
 - 4. Negative
 - 6. Carbon Dioxide
 - 11. Period
 - 12. Liquid
 - 14. Atom





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