

# Ellie & Pete's Atomic Adventure



Created by Chemistry Students from McKinney ISD





# Ellie and Pete's Atomic Adventure



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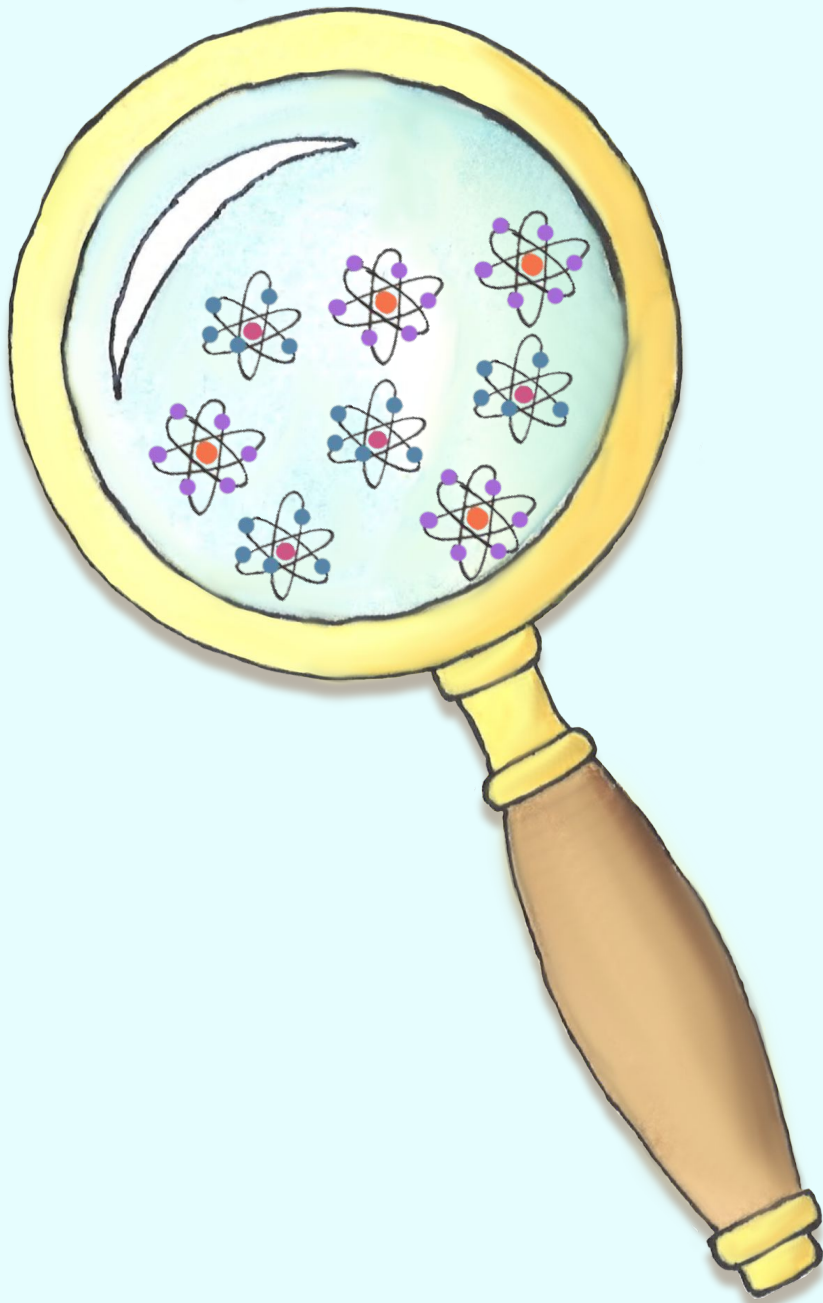
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Once upon a time, in a teeny tiny world, one even smaller than the smallest spot on the littlest baby ladybug, there was a particle called an **atom**.

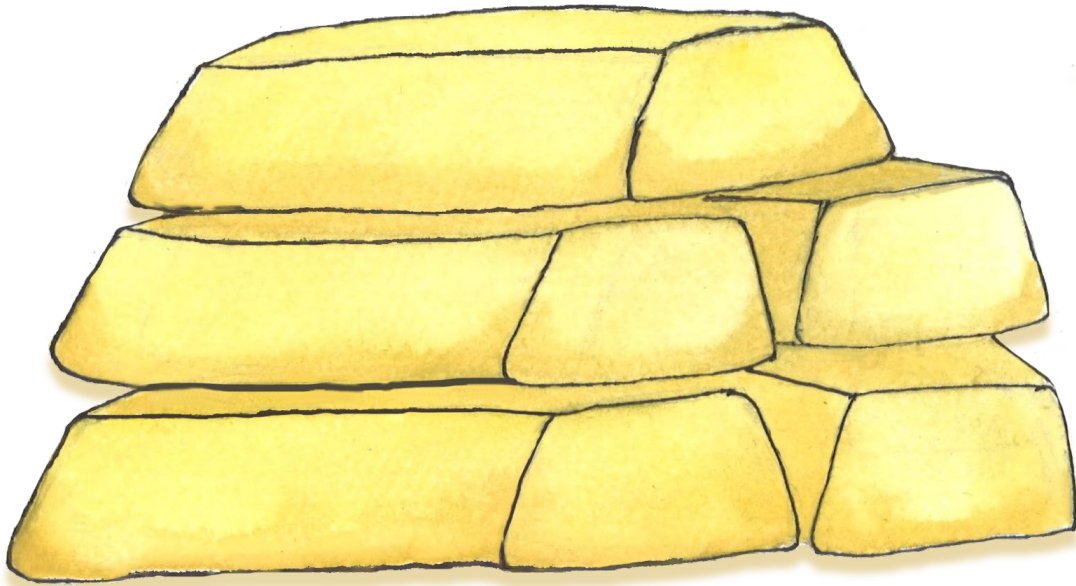




### **Fun Fact:**

An **atom** is so small that it cannot even be seen with 10 magnifying glasses stacked on top of each other!

There are over 100 different kinds of atoms, each with a different name. Each kind of atom is called an **element**.



**Fun Fact:**

The **particles** in a gold bar are in the **solid** form, which means they are very close together.



There are some elements that are so rare that they have only been found in science **laboratories** and only exist for seconds at a time!

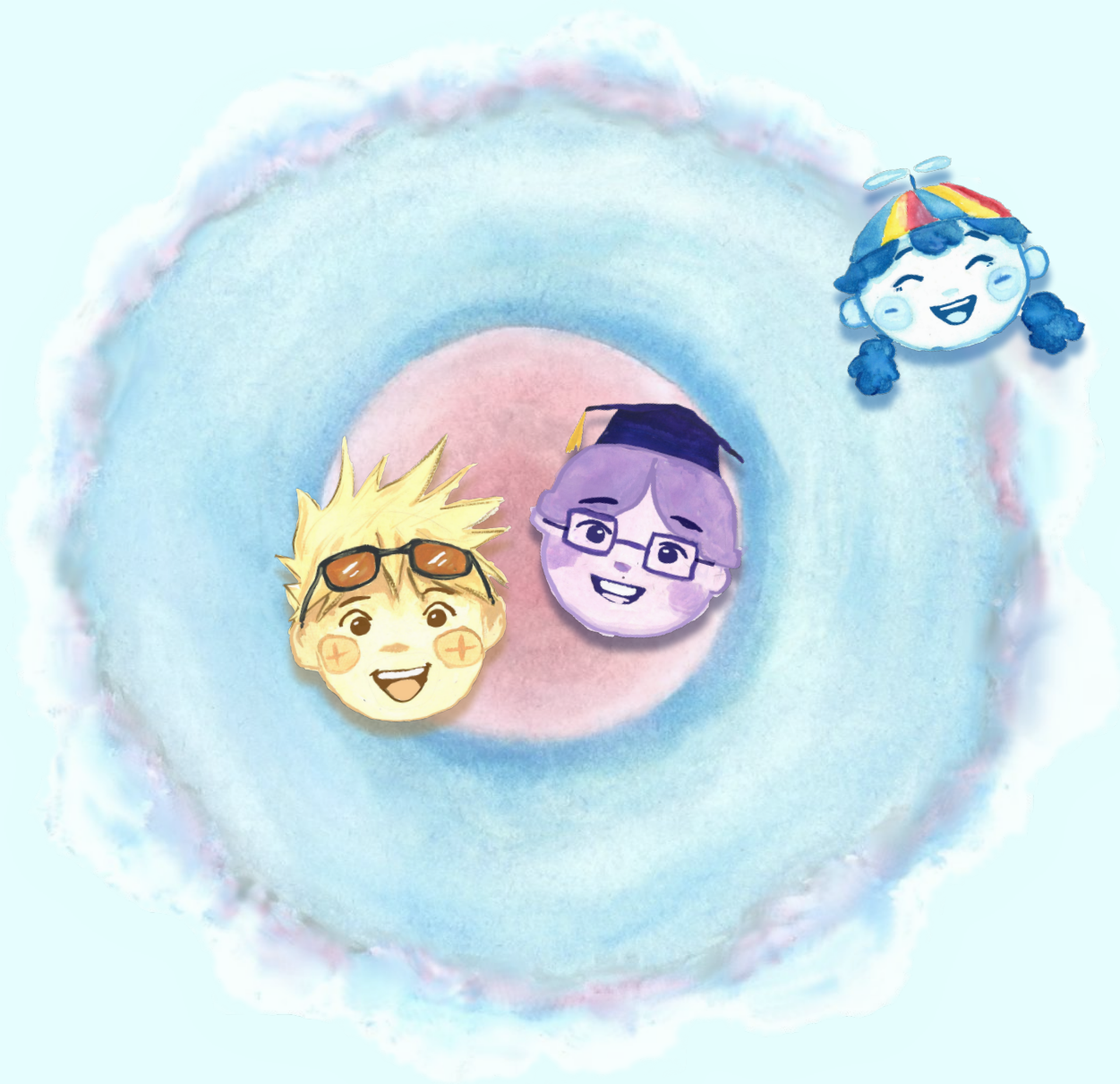


**Fun Fact:**

Helium particles in a balloon are in the **gas** form, which means they are very far apart from each other! They fill up the space of any container they are in!



This story takes place on a single hydrogen atom. On this atom lived Ellie the **Electron**, Pete the **Proton**, and Nate the **Neutron**.



Ellie the electron was an inquisitive little particle that loved to ask questions. Pete was a cheerful particle that loved going on adventures. Nate was a very thoughtful and wise particle.



### **Ellie the Electron:**

- Negatively charged
- **Orbits** around the atom
- Always curious!

### **Pete the Proton:**

- Positively charged
- In the center of the atom
- Loves adventures!

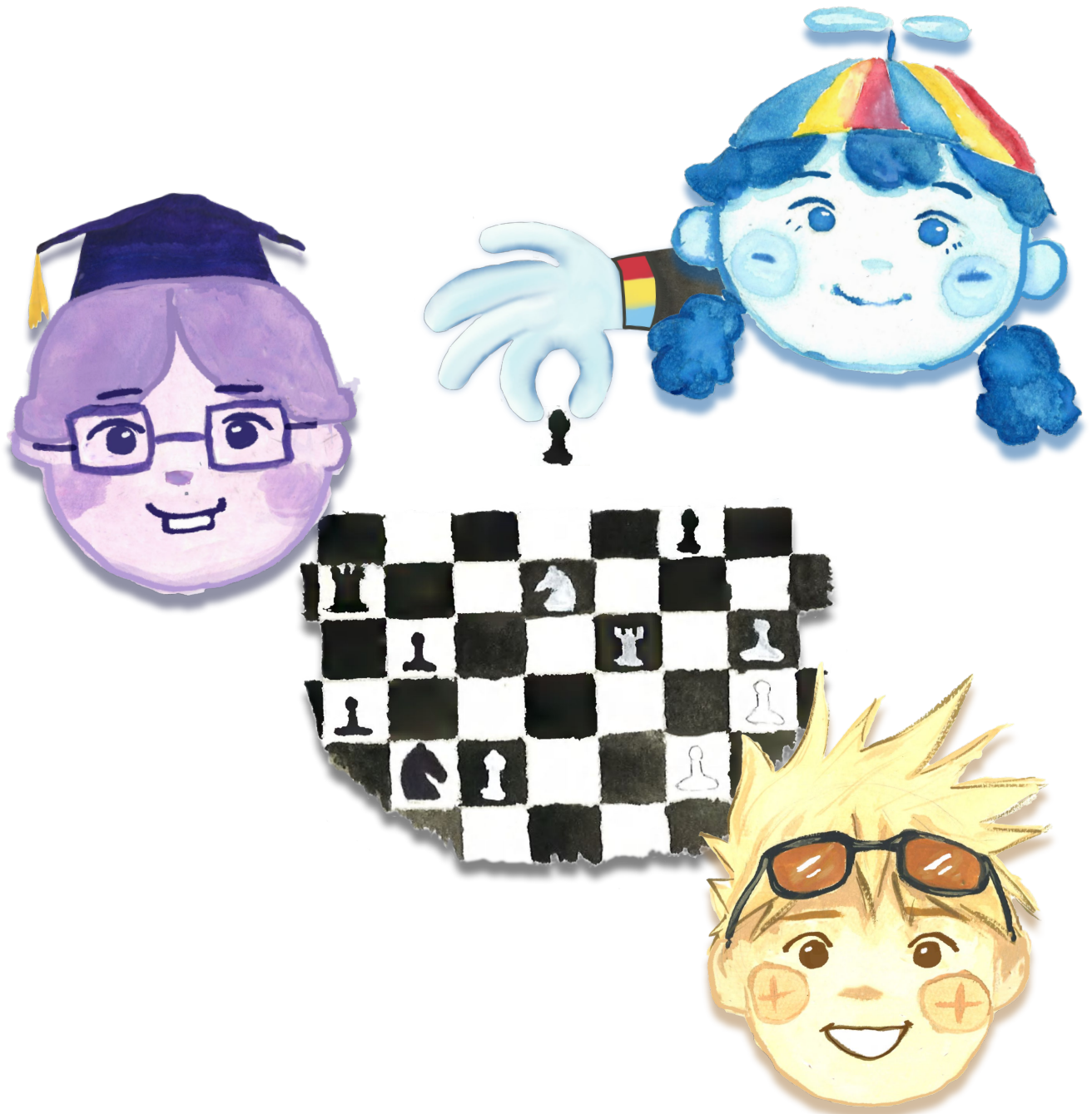
### **Nate the Neutron:**

- Neutral
- In the center of the atom
- Loves studying!



When Ellie and Pete were playing, Nate could usually be found programming on his computer, snuggled up reading, or in the laboratory doing chemistry experiments.





Even though Nate didn't like running and playing outside, he was still best friends with Ellie and Pete. They played inside games together.



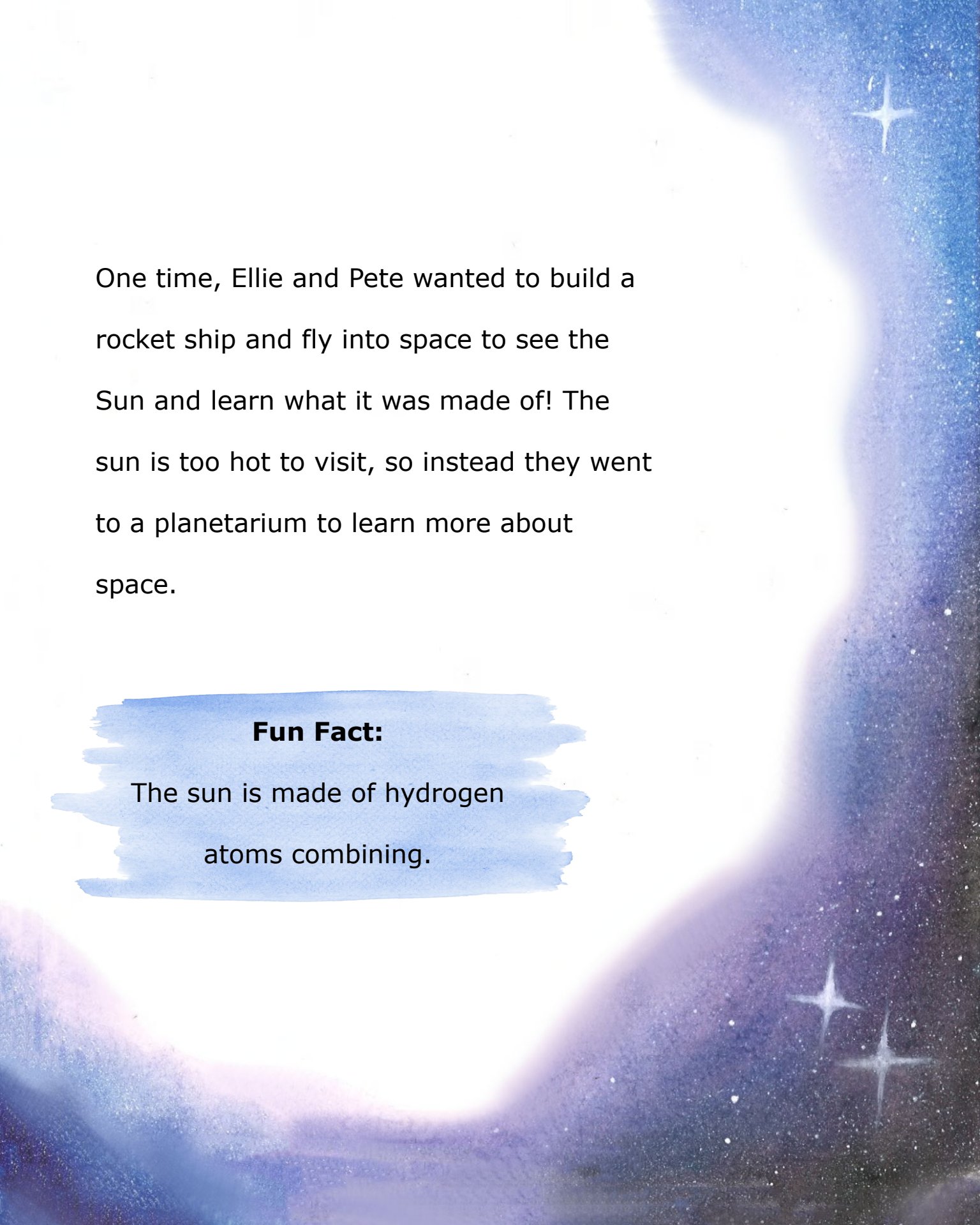




On days when Nate  
wanted to stay inside  
and read, Ellie and Pete  
went and had their own  
adventures together!







One time, Ellie and Pete wanted to build a rocket ship and fly into space to see the Sun and learn what it was made of! The sun is too hot to visit, so instead they went to a planetarium to learn more about space.

**Fun Fact:**

The sun is made of hydrogen atoms combining.







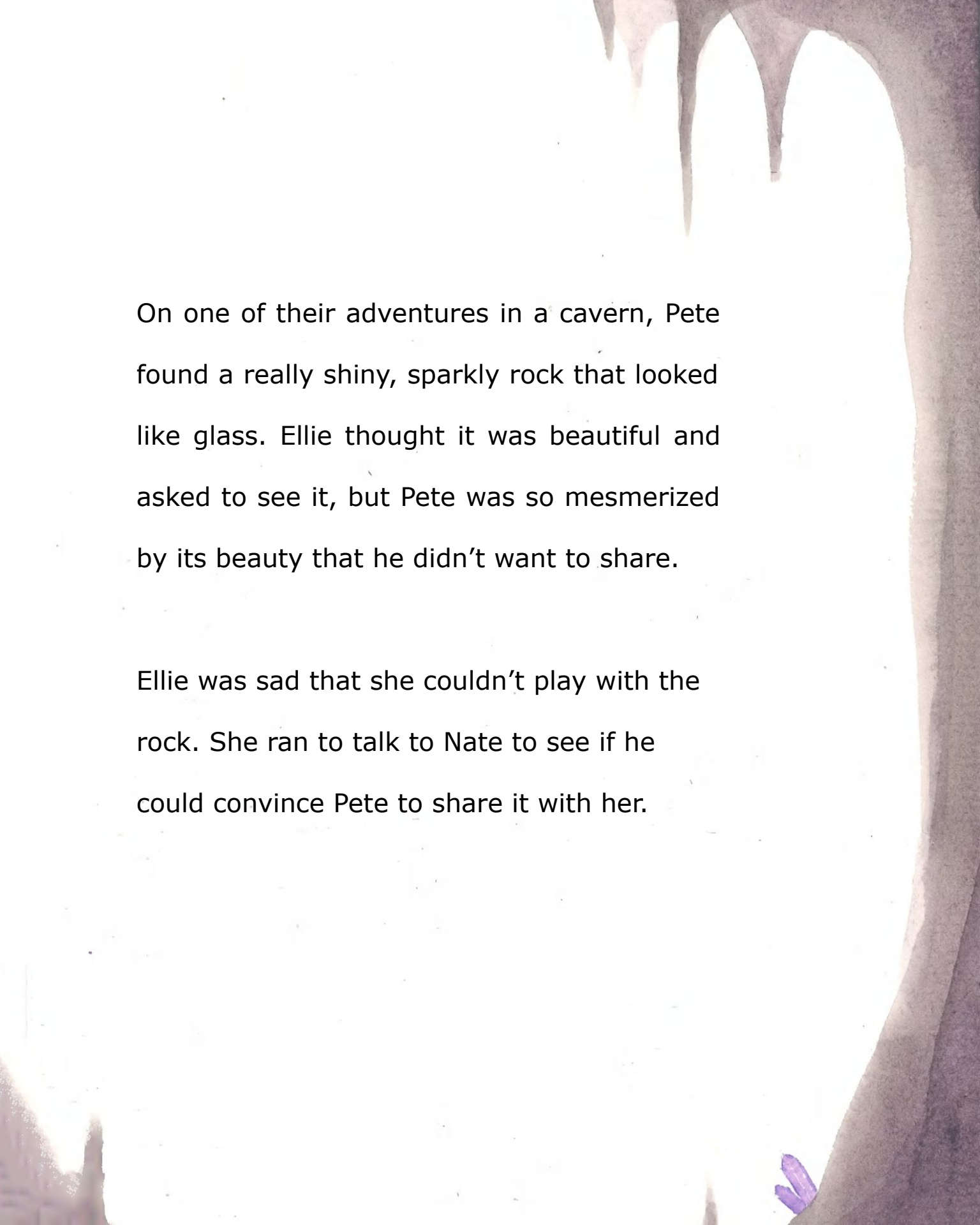




During another adventure, they wanted to grow so that they could talk to crickets and learn what made them so noisy. Since they couldn't find a way to talk to crickets, they checked out a book at the library to figure out the reason.

**Fun Fact:**

Crickets make noise by rubbing their legs together.



On one of their adventures in a cavern, Pete found a really shiny, sparkly rock that looked like glass. Ellie thought it was beautiful and asked to see it, but Pete was so mesmerized by its beauty that he didn't want to share.

Ellie was sad that she couldn't play with the rock. She ran to talk to Nate to see if he could convince Pete to share it with her.



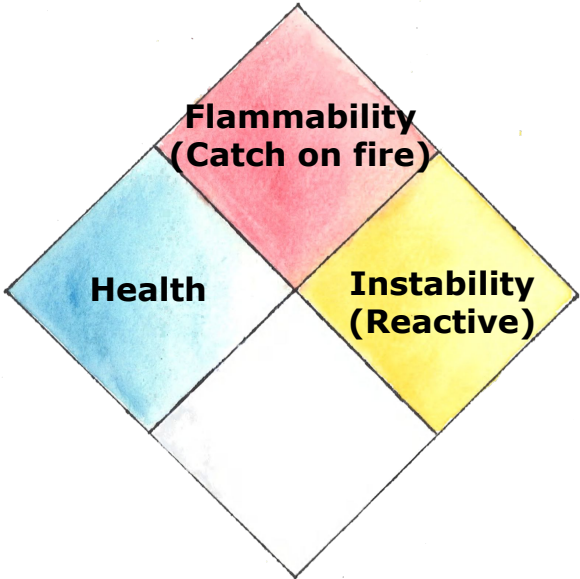




Nate immediately talked to Pete because it is unsafe to touch substances if you don't know what they are. He was concerned for Pete's safety. Nate took their discovery back to the laboratory to make sure it was safe for Ellie and Pete to play with.

| Rating | Danger Information |
|--------|--------------------|
| 0      | No risk            |
| 1      | Slight risk        |
| 2      | Moderate risk      |
| 3      | Serious risk       |
| 4      | Extreme risk       |

**NFPA Safety Label**  
(Fire Diamond)



**Not So Fun Fact:**

Some elements are extremely toxic and can hurt you. All substances should be considered unsafe until you know what they are.

If ever in doubt, you can find out about an element by researching its fire diamond. The number in blue, yellow, and red portions of the fire diamond will tell you how dangerous the element is.

Ellie and Pete were waiting patiently outside the laboratory to find out if their rock was dangerous. Pete was worried because he had played with it, and Ellie was really worried for her friend. Nate came out with a smile and told them not to worry, for their rock was actually a beautiful diamond!



### Fun Fact:

Diamonds are valued for their beauty. Jewelers determine how valuable they are using the 4 Cs - cut, color, clarity, and carat!

- **Cut** - sparkles increase the value of a diamond
- **Color** - cloudiness decreases the value of a diamond
- **Clarity** - chips and cracks decrease the value of a diamond
- **Carat** (weight) - the heavier the diamond, the more expensive



Nate decided to take the diamond to a science museum so its beauty could be shared with the world. As they were all leaving, Ellie and Pete asked if they could stay and explore the laboratory. It looked like a really exciting place full of adventures!

**Fun Fact:**

A laboratory is a place with special equipment that can be used to perform chemistry and other science **experiments.**



Nate told them a laboratory wasn't a safe place for a young particle unless supervised by an expert chemist. He told them that he would give them a tour some other time, and that he might even let them help him with an experiment if they promised to wear their safety goggles.



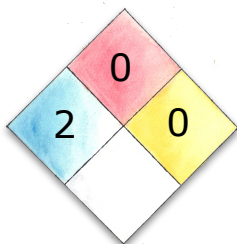
## Do all experiments require safety goggles?

The next page shows an actual chemistry laboratory! Students are conducting an experiment on April 8, 2024, at McKinney High School in McKinney, TX. This particular lab did not involve hazardous chemicals (see NFPA fire diamonds below).

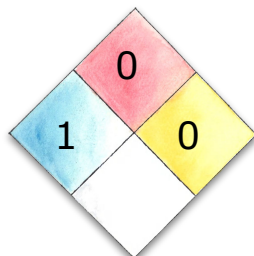
The students were closely supervised by their instructor, who has advanced science degrees and peer-reviewed publications from laboratory research. Because there was no heat, glassware, or hazardous chemicals used in this experiment, and because the experienced instructor was always in the room, students were not required to wear goggles for this experiment.

For labs involving heat, glassware, or hazardous chemicals, students should ALWAYS wear safety goggles.

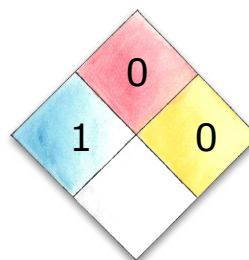
Fire Diamond  
Copper (II) Sulfate



Fire Diamond  
Potassium Nitrate



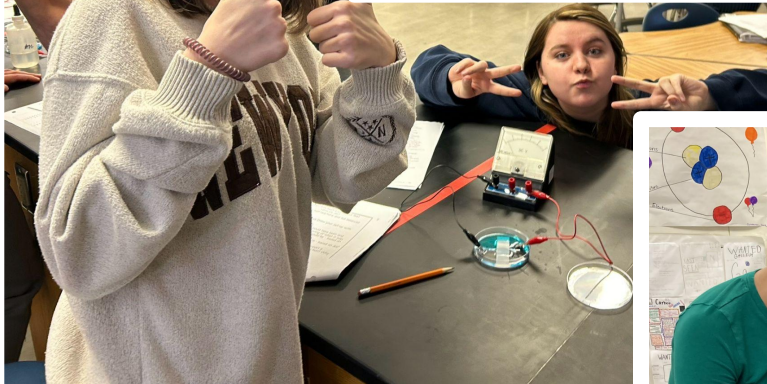
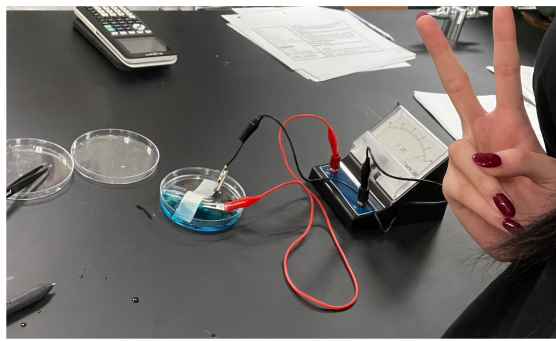
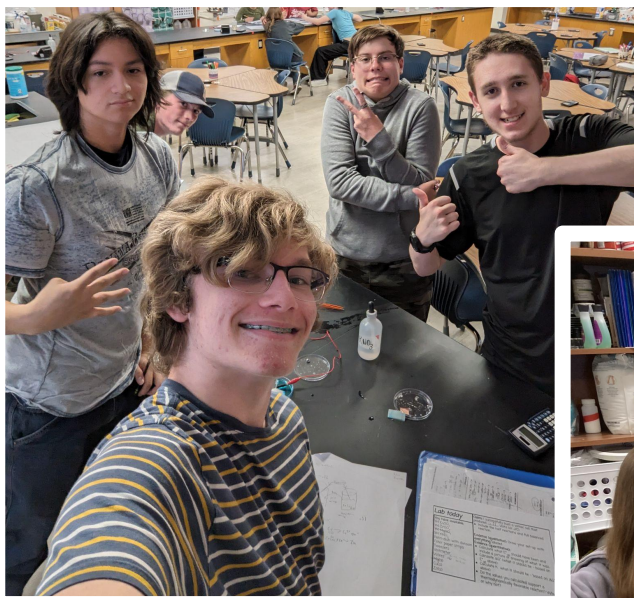
Fire Diamond  
Zinc Sulfate



Santa Clara University Chemical NFPA Information:

<https://university-operations.scu.edu/media/offices/university-operations/ehs/laboratory-safety/Hazard-Summary---Common-Lab-Chemicals.pdf>



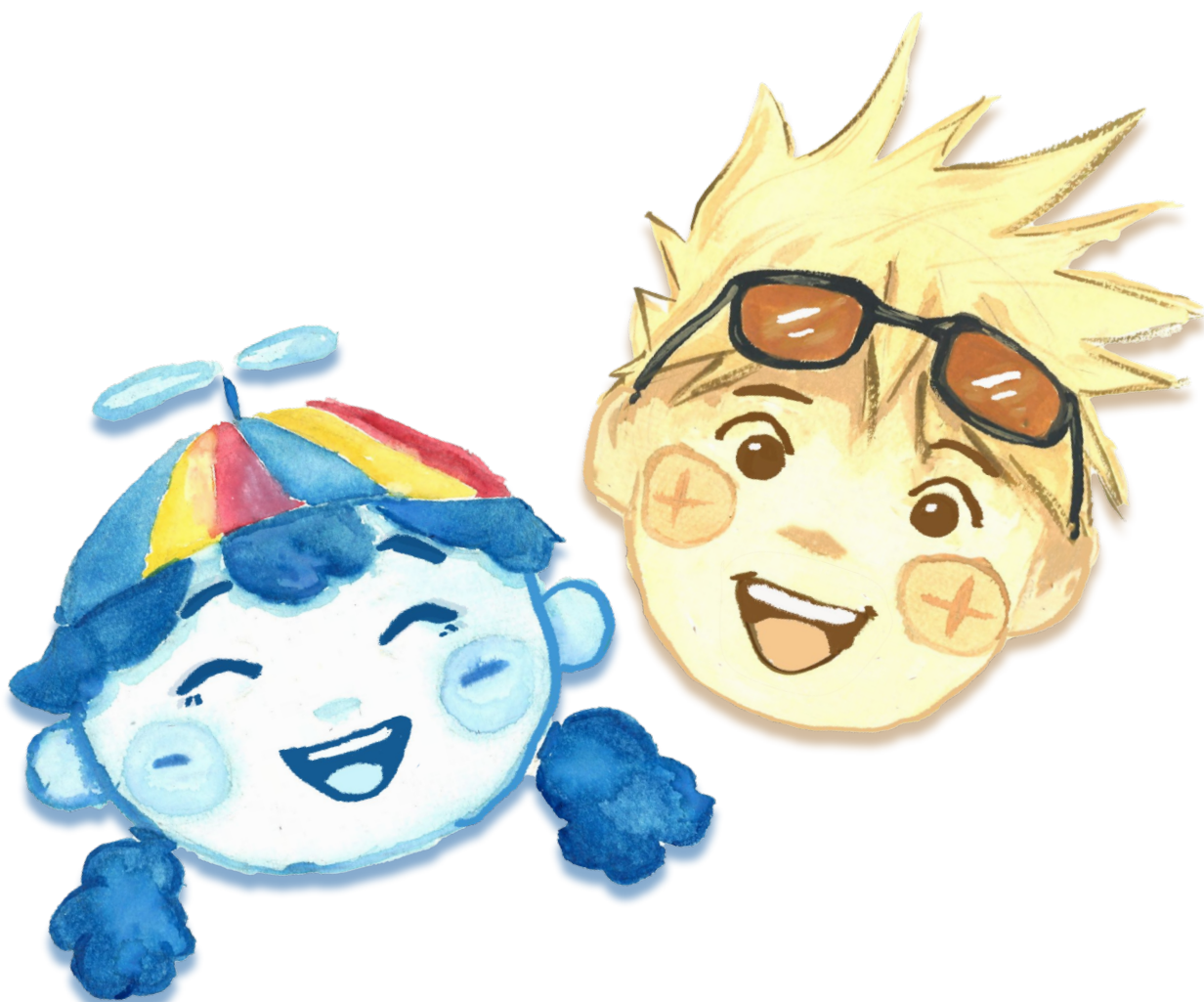




Nate, usually so neutral and calm, was so happy that Ellie and Pete were interested in chemistry, and he couldn't wait to tell them more!



Ellie and Pete were so happy to learn about chemistry, and they couldn't wait for their next adventure (hopefully in the laboratory with Nate!



## Ready to do your own experiment?

The next few pages will tell you how to do an experiment in your very own kitchen, no laboratory needed!

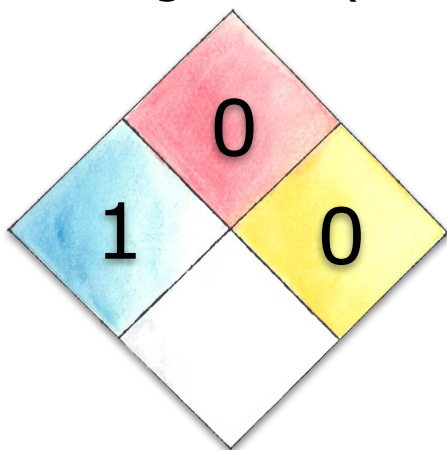
Materials you will need:

- An adult to help you - NEVER do chemistry experiments by yourself!
- Empty plastic water bottle or soda bottle
- One party balloon
- Measuring spoons
- Measuring cup
- **Reactant 1** - The chemical baking soda (see the fire diamond on the next page for safety information)
- **Reactant 2** - The chemical vinegar (see the fire diamond on the next page for safety information)



## Fire Diamonds for Reactants

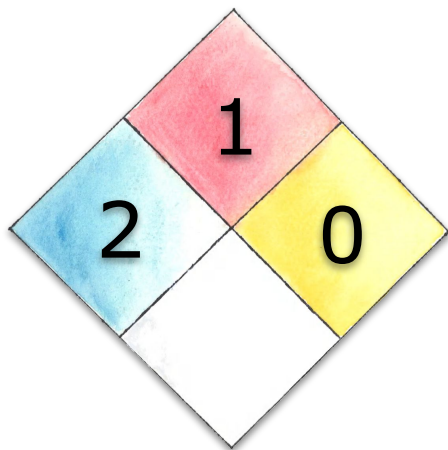
Baking Soda (solid)



### **Safety information:**

Slight health hazard. Do not eat.

Vinegar (liquid)



### **Safety information:**

Moderate health hazard.

Do not drink.

Slight fire hazard, do not use around fire.

# Balloon Adventure

## Procedure (steps):

- 1) Get a parent to help you. NEVER do an experiment without your parents' permission.
- 2) Empty and clean out a plastic water or soda bottle, and then add 1/2 cup of vinegar.
- 3) Add 1 teaspoon of baking soda to the inside of a balloon.
- 4) Put the balloon around the plastic bottle opening, but do not let the baking soda mix with the vinegar.
- 5) Once you are ready to see your chemical reaction, hold the balloon up so that the baking soda will fall into the bottle and mix with the vinegar to produce the gas carbon dioxide!

## Clean up:

- 1) Take off the balloon and throw it in the trash.
- 2) Add tablespoons of baking soda one at a time to the vinegar in the bottle until there are no more bubbles forming.
- 3) Rinse the contents of the plastic bottle down the sink and recycle the plastic bottle.
- 4) Clean up and put the other materials away.
- 5) Always wash hands after any lab.



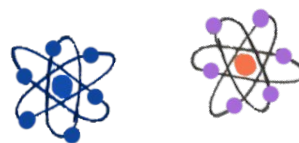


**Fun fact:**

The product of this experiment, carbon dioxide, is a gas that you cannot see or smell, but you breathe it out every single time you exhale! Also, plants use carbon dioxide to grow, there would be no plants without this essential gas particle!



## Glossary



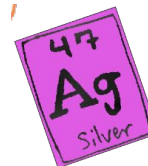
**Atom** - The basic unit of an element. It consists of a central nucleus that has protons and neutrons, and electrons that orbit, or circle, around the nucleus.



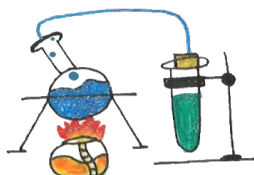
**Electron** - A negatively charged particle of the atom that is orbiting around the central nucleus.



**Element** - One type of atom. Over 100 different elements exist, and the number of protons is the same for each type of element.



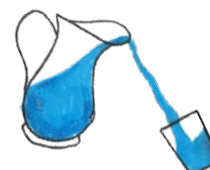
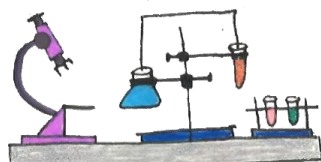
**Experiment** - Chemistry experiments start with reactants and end with products.



**Gas** - A substance that has atoms very far apart. Helium in balloons is a gas. The oxygen that you breathe is a gas.



**Laboratory** (lab) - A room that has equipment to study science and chemistry.



**Liquid** - a substance that has atoms close together, but separated enough that they can slide past each other. Water and milk are liquids.



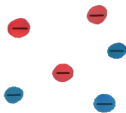


**Neutron** - A neutral particle of the atom that is in the nucleus. Even in the same type of element, there can be a different number of neutrons.

**Nucleus** - Center of the atom that contains protons and neutrons.



**Orbit** - Circling around something, like planets orbit around the sun. Electrons orbit around the nucleus.



**Particle** - Something so small it can not be seen with your eyes or even a magnifying glass. Special laboratory equipment called microscopes must be used to see particles.



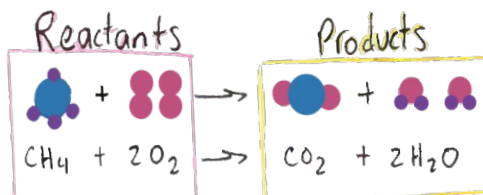
**Proton** - A positively charged particle of the atom that is in the nucleus. The number of protons is different in each element.



**Solid** - A substance that has atoms very close together. Tables, rocks, and toys are solids.



**Reactants** - What is used in a chemical reaction. What you add at the beginning of an experiment.



**Products** - What is created in a chemical reaction. What you see at the end of an experiment.

### **About this book (local service project)**

This book is a product of the McKinney Independent School District in McKinney, TX. It began with the Digital Leadership Academy offered in June 2023 at Dowell Middle School. A simple story spit out by ChatGPT to a chemistry teacher provided the skeleton for a children's book (see page 49 for original inspiration).

At the painting parties in the spring of 2024 with Mrs. Daescu and the illustrators, students at McKinney High School, it evolved into a tale about friendship and chemical awareness. The editors helped tremendously in the story development and production of the book.

Finally, it was produced to be a part of a service project to promote an interest in chemistry in our youth. The local part of the service project was to donate a copy of this book to each elementary school in the district, and to host a "chemistry summer kick-off" event for incoming kindergarten, first, and second graders where MHS students developed chemistry stations for students and parents to explore.



### **About the Experiment Passport (global service project)**

For the global piece of the service project, chemistry students recorded themselves doing “kitchen chemistry” experiments with a focus on chemical safety. The video clips were compiled into an experiment passport that parents could print out to guide them in doing safe chemistry with their children during the summer break!

**More experiments!**



## McKinney High School Chemistry Participant Biographies

**Advisor:** Kelly Daescu is a chemistry teacher at McKinney High School. She loves all things science and all things education. Her husband Ovidiu and son Lucas are her biggest supporters, as are Victor, Sabrina, the original six Janskys, and she wants to thank them all! She also thanks her chemistry family at MISD and MHS, led by Dr. Kendra Henke, Mr. Jesse Abel, and Mrs. Heather Matkoff. Finally, this book would have never happened without the Digital Leadership Academy and the seeds planted by Holly Clark, Amanda Gavin, and Lynda Swanner, as well as the fellow digital leader participant Johanna Brubaker and her amazing STEMist daughter Maddie.



**Isabella Adeogun** (STEAM campus outreach)

Isabella is a junior in AP® Chemistry. She has a passion for video production and editing and also enjoys creating things in her free time using her amazing crocheting skills. She is a co-founder and vice president of McKinney High's Crochet Club! Her favorite thing to learn in AP® Chemistry was rice tables because she found it easier to organize her work which helped with her overall speed solving equilibrium problems.

**Zalana Aguillard** (book illustrator, experiment passport)

Zalana is a sophomore at MHS. She is an aspiring artist with a passion for all things creative and is so excited to have contributed to the making of this book! She is a violist in the MHS Varsity Chamber Orchestra and enjoys playing music outside of school. In her free time she draws, paints, crochets, sews, and bakes. Her favorite chemistry topic is galvanic cells (batteries!) because she likes to see the real-world applications of the concepts she studies.



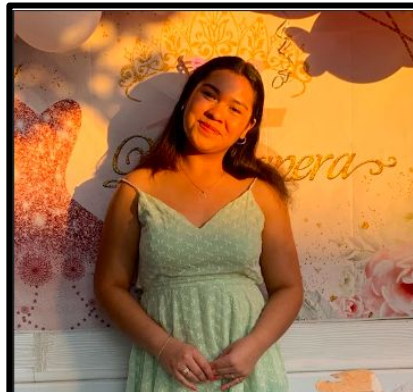
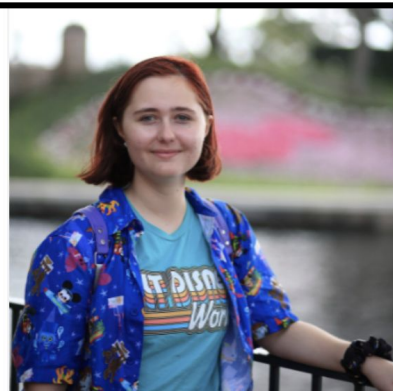


**Bailey Albuquerque** (experiment passport, event hospitality)

Bailey is a sophomore and Varsity Cheerleader at MHS. Watching and cheering for sports, especially football, is one of her favorite hobbies. She loves science and doing science competitions! Her favorite chemistry topic is energy because whether it is potential, kinetic, or free energy, it is used to make and break molecules which are super interesting to learn about.

**Lindsey Arterburn** (experiment passport)

Lindsey is a sophomore and member and member of the Royal Pride Band and JROTC at MHS. Outside of school she loves going camping and horseback riding with her boy scout troop. Her favorite subject in chemistry is stoichiometry because she thinks it's cool how everything can be connected through conversions.



**Diana Asencio Samayoa** (experiment passport)

Diana is a sophomore at McKinney High and is involved in multiple clubs. Her favorite hobbies include reading and volunteering at Halos T-Ball with Special ED. She loves hanging out with her family and friends, learning new things, and having fun! Diana's favorite chemistry topic is application of thermodynamics because she loved being able to see it in real life.

**Brooke Barragan** (Principal editor & logistics, experiment passport)

Brooke is a sophomore at McKinney High. When she isn't busy studying for her classes, she enjoys playing the viola in the MHS Varsity orchestra, playing volleyball, and reading new books in her free time. She loves learning about all things science — especially neuroscience — and wants to one day have a career in the healthcare field. Her favorite chemistry topic is kinetics because she enjoys closely examining chemical reactions to understand how they work.





**Kami Bloxham** (experiment passport)

Kami is a student in AP® chemistry and a sophomore at McKinney High School. She is in the MHS varsity choir and loves to sing and be a part of music. Her favorite chemistry topic is the safety unit because it teaches the stemists how to be safe and how to act in the lab.



**Madeleine Brubaker** (Book project leader, lead book illustrator, )

Maddie is passionate about art, interior design, and architecture. She has been involved and excelled in many art competitions. She also has an instagram page (@mebpaintings) dedicated to her art. She has always loved science, and her favorite chemistry topic is thermodynamics because the the complex relationships between heat, disorder, and favorability determine whether reactions will occur.

**Angeline Bryner** (book illustrator, experiment passport)

Angeline is an art student at MHS in addition to being part of the broadcasting team. Along with video production and photography, she enjoys painting or drawing in her free time, and loved helping bring this book to life. Her favorite chemistry topic is periodic trends because it helps explain how and why the periodic table is arranged.



**Caylin Butler** (experiment passport)

Caylin is a sophomore at MHS. While being a dedicated athlete, she is also pursuing a healthcare career by enrolling in various health science classes, clinical programs, and even taking up an officer position for the national HOSA organization. Traveling around the world is her favorite hobby! She loves learning about IMFs because it's fun to know how the bonds impact the chemical compounds.

**Cadence Cain** (experiment passport)

Cadence is a sophomore at MHS. She is an ambitious musician and stemist who loves to read, spend time with family, and practice cardmaking from time to time outside of school. Her favorite chemistry topic is equilibrium because she enjoys learning about the extensive material like the equilibrium constant, reaction mechanisms, and Le Châtelier's principle.



**Brea Christensen** (experiment passport)

Brea is a sophomore at MHS. She likes to bake, create/listen to music, go thrifting, and go shopping for records! One of her absolute favorite chemistry topics is stoichiometry as she found it to be like solving a puzzle which is very fun for her.



**Chloe Cole** (experiment passport)

Chloe is a sophomore at MHS and is apart of HOSA and Choir. In her free time she likes to read, paint, spend time with friends and is an avid believer in retail therapy. Her favorite chemistry topic was acids and bases because it had the most interesting labs and was by far the best unit!



**Dyson Dorsey** (STEAM outreach)

Dyson is a Senior at MHS. He's an aspiring orthodontist with a passion for knowledge and all things science. He is a Bass II in his varsity vocal jazz ensemble and concert choir at MHS, a black belt martial artist in Taekwondo, and loves spending time with friends and family. In chemistry, his favorite subject was Thermodynamics. He loved it because the unit as a whole taught him the relationship between Enthalpy (heat energy) relates to changes in states and chemical reactions.





**Kendall Ellison**(experiment passport)

Kendall is a sophomore at McKinney High. She is a team member of MHS1, the school news, where she enjoys showcasing the athletic achievements of her peers. Kendall is a self-titled "NBA historian" who loves going to Mavs games in order to cheer on her favorite player: Luka Doncic. She also enjoys reading and traveling. Her favorite chemistry topic is intermolecular forces (IMFs) because they explain why molecules have certain physical properties.

**Amarisa Espino**(experiment passport)

Amarisa is a sophomore and basketball player at McKinney High School. Outside of school she enjoys spending time with friends and family and staying active outdoors. She loves STEM and enjoys attending UIL science meets with her fellow club members. Her favorite chemistry topic is IMFs because she finds it fascinating how atoms come together to form everything around you in your daily life.



**Valentine Falanga** (experiment passport)

Valentina is currently a sophomore at MHS. She has been doing competitive gymnastics for over 10 years, and whenever she's not in the gym, she enjoys painting, making jewelry, and going on long walks! Her favorite chemistry topic is kinetics because she loves learning about chemical reactions and how they appear in real life!

**Keira Gallegos** (experiment passport)

Keira is a sophomore and an AP® Chemistry student. Along with being a stemist, she enjoys playing varsity volleyball for MHS and sand volleyball outside of school. In her free time she enjoys hanging out with her friends, baking, and listening to music! Keira's favorite chemistry topic was pH because of the fun experiments and interesting concepts.





**Elliott Garms** (experiment passport)

Elliott is an AP® Chemistry student. Along with being a stemist, she also plays volleyball and has been an actress and technician in theatre since she was 7. Her favorite chemistry topic is titrations because she loves seeing the colors different indicators make!



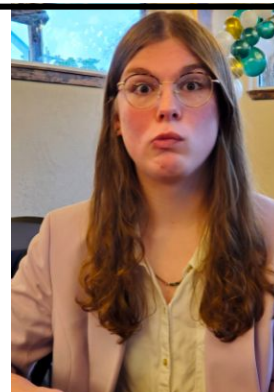
**Ethan Gregson** (experiment passport)

Ethan Gregson is a sophomore at MHS and is taking AP® chemistry. Ethan plays bassoon and saxophone in the Royal Pride Band, as well as attends boy scouts for troop 909. In his freetime, he loves practicing his band music and exploring the wilderness. In school, he loves math and science. His favorite chemistry topic is atomic structures because it's like piecing together a puzzle.



**Quinn Haney** (Principal editor & logistics, experiment passport)

Quinn Haney is a sophomore at McKinney High School. She loves reading, singing and learning about the world. She is a member of the MHS Theatre program and a part of the Choir department. Additionally, she is a part of the Academic UIL team, and she enjoys having fun with her friends any chance she can get!



**Allie Heuvel** (experiment passport)

Allie is a sophomore at McKinney High School. As well as being a stemist, she spends time dancing and is a Varsity Marquette. Her favorite chemistry topic was thermodynamics as it was fun to identify what reactions were favorable.



**Adalyn Houx** (experiment passport)

Adalyn is a sophomore at McKinney High School. She enjoys reading and going on walks in her free time, she has also been a competitive cheerleader for 11 years and is currently on a Worlds team at Cheer Athletics. Her favorite chemistry topic is acids and bases because she likes learning about what happens when you make different solutions!



**Taro Higuchi** (experiment passport)

Taro is a sophomore at MHS. He is a cellist for the MHS Orchestra and has been doing music since 8 years old. He is also part of the MHS UIL Math team competing against other schools from different school districts every month. He loves STEAM subjects and loves to compete in them. His favorite chemistry subject topic is entropy (random chaos!) because it provides an explanation for the unknown and provides a theory for the chaos.



**Danielle Howard** (experiment passport)

Danielle is a sophomore at McKinney High School. She is also very involved in school, she is a varsity cheerleader, student council vice president, a PAL, and a part of various clubs. Danielle's hobbies include watching movies and hanging out with friends. Her favorite chemistry topic is atomic structure and electron configurations because everything in the world is made of atoms.



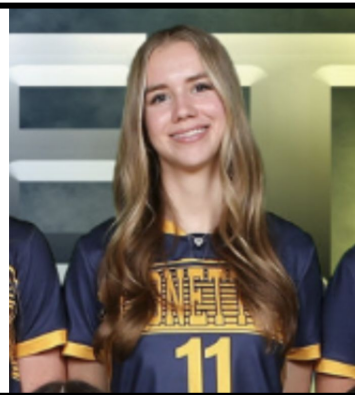
**Kammie Kristufek** (experiment passport)

Kammie Kristufek is a soccer player at McKinney High school, part of engineering club, and a member of girls in STEM!! She also enjoys hanging out with friends especially when she goes on sonic runs!! She also loves chemistry, her favorite topic to learn about was Acids and Bases because the lab was so cool!!



**Bella Larsen** (experiment passport)

Bella is a sophomore at McKinney High School. She enjoys playing soccer for school and for club. Her favorite chemistry topic is thermodynamics because she likes to see the relationship between heat, work, temperature, and energy.



**Jonathan Lebel** (experiment passport)

Jonathan Lebel is an AP® Chemistry student who enjoys a wide variety of activities. He is a member of BSA Troop 303 of McKinney, an avid cyclist, and extreme nature enthusiast. His favorite chemistry subject is electron geometry.



**Christopher Lewis** (experiment passport)

Chris is a sophomore at MHS. He loves soccer, reading, watching the NFL or NBA and anything sports. His favorite subject in school is math and is currently in Pre-Calc as a Sophomore. His favorite unit was Intermolecular Forces and how their bonds shape and break everything in our universe.



**Emily Littrell** (experiment passport)

Emily Littrell is an AP® Chemistry student at McKinney High school. Her favorite activities are playing soccer, running track, and hanging out with her friends. Her favorite unit was acid and bases because she enjoyed the lab where you would add more base and it would change the colors of the acid. Emily loves doing labs with her AP® Chemistry friends Mady, Kammie, and Keira because they always make it fun.







**Ian McCarter** (experiment passport)

Ian is a sophomore at MHS in 4 AP® classes! He enjoys building rockets, playing video games, and is a member of the Muslim Youth Association. His favorite topic in chemistry is equilibrium because it was the first time that he learned chemical reactions are reversible.

**Kinsey Molina** (experiment passport)

Kinsey is a hopeful chemist who has also been playing volleyball for the past 6 years and plays for both her school and for a club team. She especially enjoys reading, hanging with her friends, and studying for her AP® classes. Her favorite topic was thermodynamics because it involves a lot of math and Kinsey loves math.



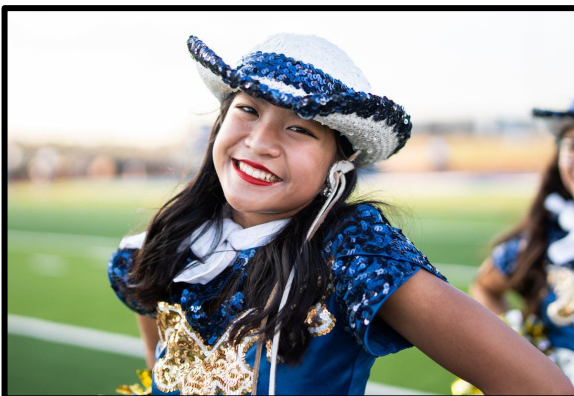
**Samantha Moses** (book illustrator, experiment passport)

Samantha is an active member of McKinney FFA. She shows pigs and judges meat along with keeping up with a rigorous academic schedule including several AP® classes. She enjoys the outdoors, is an avid hunter and loves spending time with her family and attending church. Her favorite chemistry topic is Electrochemistry because she's always been super interested in how energy in the universe works.

**Zachary Neverdousky** (experiment passport)

Zach is a sophomore at MHS. Alongside chemistry, he enjoys studying Science UIL and Math UIL. Outside of school, he enjoys working with computers and playing sand volleyball with his friends. His favorite chemistry topic is the reduction and oxidation reaction because of their application with batteries.





**Madeline Ngo** (experiment passport)

Madeline is a sophomore at McKinney High. She participates in the drill team, and loves to dance. She also loves to hang out with her friends and take trips to Sonic. She loves taking chemistry at MHS. Her favorite chemistry topic is kinetics because she loved learning about why reactions occur at different speeds.

**Daniel Nwaekwe** (experiment passport)

Daniel is a sophomore at MHS. He is a member of the track and field team, as well as being part of the Black Student Union. In his free time, he likes to hang with friends, make music, and take naps. His favorite chemistry topic is spectrophotometry, because he loves seeing the way light factors into the absorbance of solutions!



**Kevin Olvera** (experiment passport)

Kevin is a sophomore at McKinney high school. He is in many extra curriculars, but the ones he likes the most is band and being a stemist in AP® chemistry. He always looks forward to competitions and the next opportunity. His favorite chemistry topic was the acids and bases reactions, especially the experiments where he got to see the plating of the cathode.

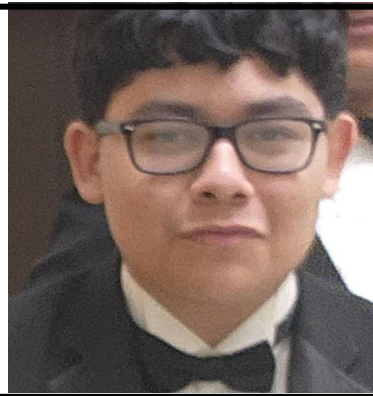
**Jose Perez** (experiment passport)

Jose is a sophomore at MHS. He is also a trombonist in the Royal Pride Band and plays music outside of school. His favorite topic in chemistry is thermodynamics because he likes to know how heat and temperature affects reactions and makes them exothermic or endothermic.



**Kevin Ramierz-Vargas** (experiment passport)

Kevin is a sophomore at MHS and a member of the band. Outside of school Kevin likes to play his trombone and occasionally also plays baseball with his friends. His favorite chemistry topic is equilibrium because he enjoys being able to make sure things are equal.



**Xander Shegog** (experiment passport)

Xander is a very dedicated and ecstatic stemist and student in his sophomore year. In his time outside of school he enjoys to ride his bike, skateboard, and swim. His favorite chemistry topic is spectrophotometry because he thinks that the way light reflects is cool!



**Samantha Sneller** (event coordinator, experiment passport)

Samantha is a 10th grade stemist in AP® Chemistry. Her favorite unit is Applications of Thermodynamics, more specifically entropy and the universe's natural state of disorder! She enjoys hanging out with her friends, listening to music, and reading.



**Caleb Starnes** (experiment passport)

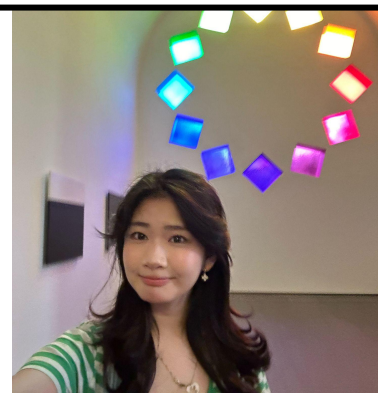
Caleb is a sophomore at McKinney High. He enjoys running, lifting, and spending time with his friends. Additionally he likes to relax at home, listen to music, and watch Friends. His favorite chemistry topic is Le Chatelier's Principle, which has to do with how a chemical reaction balances based on a change in one side of the reaction.





**Annam Tran** (book illustrator and illustration editor)

As an artist and an aspiring girl in STEM, Annam is very passionate about the incorporation of art in education. As a visual learner, Annam finds joy in the world of drawing. She is active as president and founder of her school's Asian student union, and finds pride in connecting with the Asian American community. Annam's favorite AP® chemistry topic is intermolecular forces and properties because it is enjoyable to visualize.



**Audrey Tremble** (experiment passport)

Audrey is a sophomore and a Varsity Soccer player at MHS. She likes to play soccer and sing in the Varsity choir at MHS. In her free time she also loves reading and hanging out with her friends! Her favorite chemistry topic is thermodynamics because it's interesting to see how different energies relate to each other!

**Leo Ziman** (experiment passport)

Leo is a sophomore and future clarinet section leader at MHS. Outside of school Leo attends band practices, practices his clarinet, and is an avid video game player. Leo strives to have a good understanding of every subject at school. He maintains a high degree of academic excellence and is looking forward to leading the clarinet section next school year. He loves chemistry and his favorite topic is entropy because it shows how special life is in the increasingly disorderly world.



## Original story from AI at Digital Leadership Academy

Once upon an atom, in the year 2023, there lived a curious little electron named Ellie. She loved zooming around her atom's nucleus, always seeking new adventures. Ellie's best friend and supporting character was a cheerful proton named Pete.

One day, as Ellie and Pete were buzzing around, they stumbled upon a dilemma. They wondered which of them was more important in their atom. Ellie, being the electron, claimed that she was the star of the show because she whizzed around the nucleus and created chemical reactions. Pete, being the proton, argued that he was the heart of the atom because he held the nucleus together with his positive charge.

Unable to come to a conclusion, Ellie and Pete sought the wise advice of their atom teacher, Mr. Neutron. Mr. Neutron explained that both Ellie and Pete were essential to their atom's existence. He taught them about the concept of atomic radius, which was the distance from the nucleus to the outermost electron shell. Mr. Neutron emphasized that atomic radius was crucial because it determined how an atom interacted with other atoms and formed bonds. He explained that the balance between Ellie's orbit and Pete's positive charge determined the size of their atom and its reactivity.

With newfound understanding, Ellie and Pete realized that their importance couldn't be measured individually. They were like two pieces of a puzzle, working together to create a harmonious atom. Their problem dissolved, and they celebrated their partnership with a happy dance around the nucleus.

From that day forward, Ellie and Pete cherished their unique roles in their atom. They understood that teamwork and cooperation were the keys to a successful atom and a thriving world of chemistry.





**Peek inside for  
safe chemistry  
adventures**

