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Road To Regionals: A S.T.E.A.M. Team Novel

Erin DiStefano
erindistefano@gmail.com

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ROAD TO REGIONALS: A S.T.E.A.M. TEAM NOVEL

by

Erin E. DiStefano

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Director of Thesis: [Signature]
(Professor Homzie)

Second Reader: [Signature]
(Dr. Lisa Rowe Fraustino)
To my family.
Acknowledgements:

To everyone who has helped me over the past ten years. I couldn't have gotten here without you...now I feel like I'm writing an acceptance speech for the Oscars or something...anyways, seriously thanks!

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To Sam. There aren’t words to let you know how much your love and encouragement have meant. Kisses.

I'll go cry now.
Chapter 1: Sarah

The only good thing about having braces is getting out of my seventh-grade history class, Sarah thought as she followed her mom into the waiting room.

Sarah had endured eighteen long months of braces and the torture that went along with them. Today was the day. The day she was getting them removed. Most of her friends could afford to get the clear braces you couldn’t see from a mile away, unlike Sarah who had to settle for the giant silver monstrosity.

She ran her tongue over the bumpy metal brackets. Emily and Tammy, her two best friends, had lovingly named them “The Iron Giant,” after one of their favorite animated movies from when they were younger. Sarah would never say anything, but she still loved watching that movie. She was the baby of the group and didn’t want to remind everyone of it because she still liked to watch cartoons.

Just yesterday at lunch Em had leaned over to her and whispered, “The Iron Giant has some broccoli stuck in him.” Sarah took a swig of water and swished it around quickly.

“Better?” She gave Em a huge toothy grin.

“Yes, all clear,” Em said. “Excited to get those off tomorrow?”

“Of course.” Sarah gave a half-hearted smile. She was excited to get the braces removed, but she absolutely hated going to the orthodontist. Especially her orthodontist.

It was in an old building and smelled like dust. There was a creepy mural of clowns juggling painted over the dark wood paneling on one wall, a box of sad, beat-up looking toys in the corner, and a hideous burnt-orange colored shag carpet on the floor.
To brighten the place up each chair had been painted a different neon color. Just looking at them made her eyes water. That’s why she tried to keep her nose buried in homework or a book when she was there.

Today she had left her book bag at school, too excited about getting her braces off to think straight, and was forced to read an old copy of Highlights. Her phone was in her pocket, but her mother always thought it was rude to have your nose buried in your phone. It was either this or Field and Stream, with a neon orange-clad man looking up from the front cover. In his hand was the largest turkey Sarah had ever seen. Largest dead turkey she should say.

The bell over the door jingled as someone came into the office. Sarah peeked up from her magazine.

“Mother, I don’t see why you can’t just talk to the school and get me a second interview,” a nasally voice escaped from the small pale boy who had just walked in.

Sarah recognized him at once. She sank down into her chair as far as she could go. Hiding behind the magazine and trying to make herself disappear. She peeked over the magazine top again.

Simon Fisher hadn’t changed much in the almost two years since she had last seen him. His jet-black hair was slicked back, forming a dome on the top of his head. His clothes were still impeccably tailored and still made him look like a middle-aged businessman.

He seemed to have grown into his nose and ears, which didn’t protrude as much as they had before, and he had traded his coke-bottle glasses for some more sleek and stylish ones. They made his green eyes match the color of the South American tree frog.

The only thing new was a small silver cell phone hanging in a large black case from his belt buckle.
Sarah snorted. She couldn’t believe that he looked even dorkier than she remembered. She tried to stifle the snort, but failed and ended up in a coughing fit, doubled over in her chair. She was sure her cover was blown.

“Sarah,” her mom said, “are you ok? Here, have some water.”

“Sarah Spade,” the nasally voice traveled over to her. Sarah took a sip of water and looked up. Simon had made his way over and now stood directly in front of her.

“Simon,” she said curtly.

“Well, well, we meet again.” He sat down in the seat next to her and smiled.

“You’re not an evil villain in some dorky sci-fi movie, and I’m not your arch-enemy.” Sarah rolled her eyes.

Sarah wasn’t sure now what she hated more; going to the orthodontist or running into Simon Fisher. Both smelled funky and needed a full renovation, but at least the orthodontist got her out of school.

Sarah and Simon had been rivals through elementary school, always coming in first or second for every award. When Sarah won the third-grade spelling bee, Simon came in second. When Simon won the fourth-grade science fair, Sarah came in second. She had not been looking forward to three more years of competition with Simon when she started middle school, but when she got to school, Simon wasn’t there.

She always tried to be a gracious winner, and loser if the need arose, but Simon was the opposite. He had a meltdown when Sarah beat him at the weekly math puzzle in Mrs. Ireland’s class. His mother had to come to the school and pick him up. Sarah still swore she had seen him kicking and heard him screaming all the way to the car, his mom dragging him like a sack of potatoes behind her.
When he won, it was almost worse. He lauded it over her and taunted her ceaselessly for days or until he got bored.

When she hadn’t seen Simon in any of her classes the first day of middle school, she’d been relieved. She hadn’t known, or really cared, where he had gone. He was out of her life, and with all the new perils that awaited her in middle school, he was quickly forgotten. That had been over a year ago. One blissful, Simon-free year.

But now here he was, sitting next to her. Sarah decided the best course of action was to just ignore him. She stuck her nose back into the Highlights magazine and pulled out her cell phone.

Simon is here! She typed it quickly and hit the send button. Sarah thought about the text being sent out to her friends. It always amazed her that she could type something in one place and almost immediately it showed up in another.

She had asked Tammy once how it all worked. Tammy had rambled on about how a text is actually a SMS or short message service. The cell phone talks to cell towers over control channels so it can send and receive messages. Sarah had been able to understand that much, but when Tammy started talking about computer code and varying wavelengths, Sarah had been lost.

“So,” Simon drawled out the ‘o’ in his nasally voice, “what brings you here?”

“I’m getting my braces off today.”

Simon who? Tammy replied.

Simon Fisher! He went to elementary school with us. Sarah stole a glance at him over the magazine. He was still sitting next to her, reading Hunting Monthly through his new glasses. She nonchalantly sneaked her phone over the magazine and snapped a photo of him, then dropped the photo into the group text and sent it.
“I’m not going to be getting those big giant metal things. The doctor says I have genetic-delayed tooth eruption.”

Still looks as dorky as ever, Em texted back.

You should hear what he is talking about, Sarah typed.

Tammy must have plugged the photo into another app, because she sent it back with giant green cartoon bug eyes and antennae. Sarah snorted and almost dropped the phone.

“Sarah, how is school?” Simon’s mom sat down across from her in a lime-green chair.

“It’s ok.” Sarah put the magazine down in her lap, hiding her phone in the middle of the pages.

“Ma’am,” Sarah’s mom corrected her. Sarah sat up a little straighter.

“Ma’am,” she echoed. She hated it when her mom corrected her.

“Well, Simon is just doing amazingly at St. George. Aren’t you, Simon?” She didn’t pause for him to answer. “He is the captain of the Mathletes, the Chess Club and the Science-nauts. Aren’t you Simon?”

“Um-hm,” Sarah wasn’t sure what to say.

Mrs. Fisher seemed to sense her lack of enthusiasm. “Anyway…” Simon’s mom turned away from Sarah to face her mother.

Sarah relaxed, knowing that she was off the hook. She didn’t really care what Simon was up to. She had her own friends at her own school to worry about.

Super Nerd!!! Em texted, adding a couple of her signature emojis.

“Sorry about my mom,” Simon whispered. “She is kind of a helicopter mom.”

“No problem.” Sarah couldn’t relate, though. Her mom was always busy working ever since her dad passed away. Sarah turned to face Simon.
“So, what have you been doing the past two years?”

“Just school, mostly.”

“Are you still into science?”

“Yep.” Sarah wished he would just go on and ignore her.

“My school has a STEM team and we will be competing in regionals this year. I started the team last year.”

She perked up when he said this. She and Em were starting their own STEAM team at the school this year with help from their favorite teacher, Ms. Neil.

“Really?” she asked, now interested in the conversation.

“Yeah,” he answered. “It’s a lot of fun. We had some good competitions, maybe…”

Sarah adjusted her legs and her phone, which still showed the picture of Simon with bug eyes and antennae, flew off her lap. It landed on the floor face up, the picture glaring at her from the screen.

Sarah tried to move her foot on top of her phone, but Simon’s hand grabbed it first.

Sarah saw his face go from white to beet red.

“I…I’m…”

“Don’t worry about it.” He shoved the phone at her and stood up.

“Simon,” she said feebly. He didn’t say anything, but moved to the other side of the room facing away from her so she couldn’t see his face. She couldn’t believe she had kept the picture up on her phone. And he had seen where she and her friends all called him a super nerd.

The doctor called Sarah back a minute later. The nurse held open the door, and Sarah and her mother went back to the room.

She wasn’t really paying attention to anything the orthodontist was saying. Simon and
she had been rivals, but she felt bad. Maybe she should apologize to him. He couldn’t help it that he had to wear glasses and his mother bought him those old-man clothes.

When Sarah was done, she could now smoothly run her tongue over her teeth. She had a huge smile on her face. No more worrying about getting popcorn, or any other food for that matter, getting stuck in her braces. No more brushing and flossing her teeth forever each night. She felt lighter.

She knew that feeling would be even greater if she could apologize to Simon. It had been funny to see him with those bug eyes and antennae, but she also knew it would be seriously awful if someone had done that to her.

When she walked out through the waiting room, Simon wasn’t in there. She looked around for a minute while her mother checked out, but couldn’t find him anywhere.

Chapter 2: Tammy

Tammy threw the tennis ball into the air and let it fall. It bounced a couple of times before she caught it and repeated the process. She needed to get this toss down before their first match next week. The sweat dripped down her dark brown forehead and she wiped it away with the back of her arm. It didn’t help much since her arm was wet with sweat as well.

Maybe she should invent some kind of weather machine that would keep the tennis courts cool. They were always at least ten degrees hotter than the already scorching North Carolina heat.

The next time she threw up the ball, she swung her racket back and arched it up above her head. One fluid motion. That was what she was trying to achieve. If they were going to have
any chance to win their next match, the Polka Dots were going to have step up their game. And that meant she was going to have to perfect her serve.

Again and again the ball went up and she let it fall.

Then on instinct, she hit it. The ball flew over the net and landed right where she was aiming. It was the first one all day.

“Nice one, Tammy,” Mags yelled from the next court. Mags was the new girl on the Polk County Middle School tennis team. Tammy had never had much competition until Mags showed up at their first summer practice and blew them all away. Tammy’s number-one spot wasn’t guaranteed anymore. One week Mags would beat Tammy, then the next week they would reverse spots, and this was the last week of practice until their first match.

A good rivalry usually made Tammy amped up, ready to go out and show that she was the best, but this week she just couldn’t get into the zone. Her mind kept wandering to her brothers not being at her first match and the piling mountain of schoolwork she had waiting for her at home. She reached into the pocket of her pale blue skirt and pulled out another fuzzy green ball. This serve went squarely into the net.

“Hold your head up more,” the team’s assistant coach, McKenna suggested. “And make sure your toes are pointing to where you want the ball to go.”

“Thanks, Mack.” McKenna wasn’t much older than Tammy. She was a player on the high school tennis team and liked to lend a hand at practice a few days a week. Tammy’s next serve at least made it over the net.

“That’s better,” McKenna said encouragingly. “Ok, everyone, that’s enough for today. Let’s bring it in.”

All nine of the girls jogged over.
“So, we have our first match of the season coming up next week. You are all looking pretty good out there. Coach Alexander is sorting out uniforms for you guys to pick up in a few minutes.”

Tammy noticed Mags looking confident next to her. She was wearing all white, which looked great with her golden complexion and dark hair. Why can’t I be that confident? That focused? Tammy wondered.

Competitiveness ran in her family. Her brothers, Tommy and Timmy, were on full football scholarships at West Virginia University, one of the best football teams in the country. Tammy had never been interested in football herself, but played just about every other sport. Tennis in the fall. Basketball in the winter. Track in the spring.

But it wasn’t just her missing brothers and mounting schoolwork bothering her. She had shot up four inches over the summer and was still getting used to being so tall. Everything she did felt awkward and forced. Things that had come easy to her last season, like her serve, were proving to be very difficult, and she didn’t like it.

“Ready?” Mags pulled her out of her thoughts.

“Yeah.” Tammy bent down and picked up her racket. “Be there in a sec.”

“Okay.” Mags ran off the court to her mom.

Tammy watched her go. Mags was one of those people who looked exactly like her mother. They both had long sleek black hair and small petite frames. The both also had tiny noses and dark brown eyes. Willowy was the word that came to Tammy’s mind when she thought about them. She was the complete opposite. Thick and strong. The Serena Williams to Mag’s Li Na, two of the most famous tennis players on the professional circuit.

Unlike Mags, Tammy looked like her father, not her mother. They both had large thighs
and long torsos. It helped her to generate power when playing sports. For tennis, it gave her a powerful serve, when it was working. In basketball she could box out anyone. In track she always took off from the block faster than everyone else, which gave her an advantage in the hurdles, her specialty.

Tammy jogged off the court to her bag. She threw her tennis racket in and zipped it up. It always amazed her the kind of technology that went into making a plain old tennis racket. Her grandparents had old rackets up on their walls as decorations and they were old wooden frames with some kind of horse gut string.

Her new rackets were made of titanium alloy and had nylon strings. The power she could get with her new rackets was considerably more than what you could get with the old wooden ones. It had amazed her when her mother had talked to her about how the new rackets had changed the game of tennis so much.

She made a mental note to do some more research on tennis rackets and see if she could find enough information to do her science fair project on it this year. She had a lot to live up to after getting first place last year. It had actually been the first time that Sarah hadn’t won the science fair in what felt like forever.

“Girls, huddle up,” Coach Alexander yelled from across the court. “I’ve got your uniforms for you all here. Just line up to get them and then you can go. Make sure to remember that we are going to have the carwash fundraiser this weekend.”

Tammy got in line and picked up her uniforms. They were printed with the school name Polk County Middle School and the team mascot on the back the Polka Dots. She grabbed her bag and walked over to the Mu family’s minivan.

“Thanks for the ride, Mrs. Mu,” she said and got into the back seat. Mags was already
sitting in the front.

“No problem,” she answered.

Tammy slid the van door closed.

“How was practice, girls?” Mrs. Mu asked as she pulled out of the school parking lot.

“Great,” Mags said.

“Ok,” Tammy said.

“Good.” Mrs. Mu turned on the radio to NPR and turned up the volume. Tammy looked over at Mags, who was rolling her eyes.

Mags’s mom and Tammy’s mom had met at the first summer practice and already had a car pool schedule worked out. As competitive as she was, Tammy had to admit that Mags slid into the team easily, and her competitiveness made Tammy a better player. It wasn’t just tennis that Mags was competitive in. She was competitive in school, showing up in all of Tammy’s advanced classes. Math and science were turning into off-court matches of their own.

Tammy pulled her phone out of her bag, was greeted by three missed calls and a couple texts, and they were all from her parents.

Come home right after practice. We need to talk.

Missed Call 3:45 Dad.

Missed Call 4:03 Dad.

Missed Call 4:12 Mom.

It was unusual for them to be texting and calling her, especially when they knew she was at tennis practice. Something was up.

When they pulled up to her house, she knew something was really wrong. Both of her parents’ cars were in the driveway.
“Thanks for the ride, Mrs. Mu. Bye Mags.”

“You’re welcome,” she said as Tammy slid the door closed.

Tammy hesitated when she got to the door. She couldn’t think of anything she had done—anything they knew about anyway. She hoped nothing was seriously wrong. She braced herself for the worst.

“Tammy, is that you?” her father’s booming voice called from the other room.

“Yes.” She followed the voice into the kitchen. Both her parents were sitting at the kitchen table, looking guarded and not happy.

“Hey, honey, come sit down,” said her mother. Tammy’s stomach dropped.

“Is everyone ok?” Tammy moved toward the table, but didn’t sit down.

“Everyone is fine,” her father said.

“We had a talk with George, I mean Mr. Gregson, your principal,” her mom started. Then her father took over.

“It seems that someone broke into the school’s computers a couple weeks before school started.”

“Ok.” Tammy tried to keep her face blank. She sat down.

“Do you know anything about this?” He leaned forward in the chair and his eyes narrowed. Tammy was glad she had never been in trouble at school, principals could be intimidating, especially if they were your dad.

“No.” She shook her head.

“It looks like the person who did it, did it from one of the student computers.”

“Ok.”

“Are you sure there is nothing you want to tell us?”
“No, Sir.”

“Because Tammy, if we find out you had something to do with this, you are going to be in a lot of trouble. Breaking into school property is a felony. It could follow you around for the rest of your life.”

Tammy looked down at her hands. She didn’t know what to say. She couldn’t tell them what happened without getting her friends in trouble too. She wasn’t the only one she would implicate.

“Mr. Gregson isn’t accusing anyone, yet,” her mom said. “They are still working on pinning down the exact computer in came from and once they do that, it’s pretty easy for them to figure out who did it.”

Tammy couldn’t look them in the eye. She didn’t have anything to say. She was pretty sure she had covered her tracks well enough, but not positive. Would they be able to figure out it was her? Would she get her friends in trouble?

“Can I go to my room now, please?” she asked. “I have a lot of homework to do.”

“Go.” Her dad sounded angry.

Her mom grabbed her hand before she could run out of the room.

“Tammy, if you ever want to tell us anything,” her mom said, holding her gaze.

“Just…know we’re here.”

Tammy didn’t answer. She ran up the stairs feeling like she left her stomach downstairs still sitting on that chair. Were her parents accusing her of something because they knew she was so good with computers, or were they really concerned for her? She felt like she needed her brothers more than ever. They would know what to do.
Emily had been so excited all day. She and Sarah had talked to Ms. Neil at the beginning of the school year and convinced her to be the advisor for the new STEAM club, and today was going to be their first meeting. Em had talked Sarah into doing it because Sarah was the smartest person Em knew when it came to all things science.

Ms. Neil told Em that she had recruited three other students from her science classes who were willing to join. Em didn’t know who was coming but she sincerely hoped it wasn’t anyone from Tiffany’s group of friends—her stomach did a flip just thinking about it. Tiffany and her minions, as Sarah liked to call them, were always trying to make their lives miserable. Harper and Abby followed Tiffany around like she was a positive magnet and they were negative ones.

Em sat down at one of the tables and looked up at the clock. She tapped her fingers on the desk. It was five after three. She looked at the door waiting for everyone to walk in. A minute later Sarah came in.

“Yay!” Em jumped up. “I’m so excited.”

Sarah smiled. Em could hear the other students in the hallway, talking and banging lockers.

Ms. Neil was sitting behind her desk, grading papers with a bright red pen.

“Hey,” Sarah said. They both sat back down at the table. “Who else is coming?”

“I have no idea,” Em said. “Ms. Neil wouldn’t tell me.”

Em looked up as a girl she didn’t recognize walked into the room. She paused at the door.

“Is this the science club meeting?”

“Uh, yeah.” Em stood up. “I’m Emily, everyone calls me Em.”
She held out her hand.

“I’m Mags.” The girl shook.

“Hey, Margaret.” Ms. Neil stood up from her desk. “I’m glad you could make it.”

“Of course,” Mags said.

“You’re Mags?” Sarah said.

“Yeah.” The girl looked wary.

“Oh, Tammy told us all about you,” Sarah said quickly.

Mags smiled. “We’re on the tennis team together.”

“I’m here.” Everyone turned and saw Abby walk into the room.

“Ok. How about we all sit down.” Ms. Neil followed the girls the table Em had been sitting at. “We’re just waiting on one more…”

“I’m…here…” Tammy huffed into the room. “Sorry…I’m…late…”

“No problem, we were just getting started.”

Em saw Tammy, but couldn’t keep her eyes off Abby. She had never really seen Abby as her own person, just as part of Jessica’s group. And Em couldn’t forget what that group had done to her last year in sixth grade. She still flushed as red as Abby’s hair thinking about it.

“So, this is the first official meeting of the Polk County Middle School S.T.E.A.M. Team.” Ms. Neil smiled.

“Yay!” Em cheered.

Sarah clapped.

No one else moved. Em elbowed Tammy and she clapped halfheartedly.

Abby rolled her eyes.

Em was wondering why she was even here.

Em nodded. Abby was looking down at her nails, not paying any attention. Tammy shook her head no and so did Mags.

“Each letter in the word S.T.E.A.M. stands for one of the topics that our team needs to be know.”

“Is it like S.T.E.M.?” Tammy asked.

“Duh,” Abby said.


“I don’t know anything about art,” Sarah said.

“That’s ok,” Ms. Neil said. “I’ve picked you five specifically for your strengths and your weaknesses.”

Em couldn’t think of anything she was weak at. She loved to learn, no matter what the subject.

“First order of business is we need a team name.”

Em had been talking about this with Sarah all summer. They had come up with a list of five different names. Em pulled out her phone and brought up her list.

“Sarah and I came up with a list of awesome names. The Golden Comets, The Bio-Bosses--”

“I think we should use this as an opportunity to work together and come up with a name as a team,” Ms. Neil interrupted Em.

She looked around the group. Mags looked excited, Tammy kept checking her phone,
Abby still looked bored and Sarah looked embarrassed. Em just felt upset. This club had been her idea, and now Ms. Neil was taking it away from her. It wasn’t fair.

“Abby, would you go up to the Smart Board and write down all the ideas we have?”

Em saw Abby roll her eyes and turn to the front of the room. Mags raised her hand.

“Mags,” Ms. Neil said. “You don’t have to raise your hand, we can just talk like a group in here, as long as we keep it civil.”

“Oh.” Mags pulled her hand down. “Okay.”

“What did you want to contribute?”

“What about The Mad Scientists?”

“Okay, Abby write that one on the board,” Ms. Neil said. “Anyone else?”

Em watched Sarah raise her hand tentatively.

“The Solution Squad.”

Abby wrote it on the board. A few minutes later they had a list of ten team names. Em hadn’t said a word.

“How about you each pick your favorite and then we will have a vote. Abby you circle your favorite.”

Abby took a step back from the board. Em noticed her bright red hair bounced when she moved and her green eyes narrowed in concentration. She put a large circle around STEAM Team, one of Tammy’s suggestions. Em circled The Goldberg Machines, her favorite out of the ones she and Sarah had made up that summer.

Rube Goldberg was a cartoonist who would draw super complicated machines performing simple tasks, like turn on a TV or butter toast. Em’s dad had shown her the old cartoons and then showed her a video online where a team of college students created a Rube
Goldberg machine that took up a whole room. She was hooked and started turning her own room into a Rube Goldberg machine—helping her to turn off the lights, open her closet door and (in her latest attempt) open the blinds on her window.

“Ok, it looks like these are the top three. The Goldberg Machines.”


“It’s a complicated machine that performs a simple task,” Em said, trying to keep her voice even. “We are the complicated machines that will perform the task of winning.”

“I don’t think we need to have a name that we have to explain to everyone we meet.”

Abby rolled her eyes again and sat down.

“Not everyone is as--”

“Ok, girls, let’s just vote for our favorite,” Ms. Neil said, holding out her arms to keep the peace between them. “Who votes for The Mad Scientists?”

No one raised their hands, even Mags who had picked it as her favorite.

“Who votes for The Goldberg Machines?”

Em was the only one who raised her hand. She gave a sideways glance at Sarah. Sarah was avoiding looking at her. Em huffed, pulled her hand down, and crossed her arms. She felt betrayed. Sarah had loved the name when they were coming up with ideas.

“And who votes for the STEAM Team?”

Everyone else raised their hands, smiling.

“Now that we have our name, I have a very exciting announcement. I managed to get us into our first competition,” she paused. “This weekend.”

Sarah squeaked. Em was surprised, her disappointment forgotten for a second. She thought they would have time to practice. Time to become more of a team, because obviously
they weren’t a very good one right now.

“I know it’s fast, but I made these packets for you guys,” Ms. Neil handed out stacks of papers to each girl. “It tells you all the rules and the format for the competitions. Also, there is information about the types of questions they ask and specific things you each need to study. I know you all have your own strengths and weaknesses, so I’m hoping that where one of us isn’t as strong the others can shine. In order for you guys to do well, you are going to have to work as a team.”

Em flipped through the pages. She skipped over all the rules and regulations, focusing on what Ms. Neil saw as her strength, Engineering. She smiled because Ms. Neil was right, Em loved Engineering.

“Since we don’t have another meeting scheduled before the competition, I want you guys—"

“Girls.” Abby interrupted.

“Yes,” Ms. Neil said smiling. “I want you girls, to come in here on Friday for lunch during school and we can run through some practice questions,” Ms. Neil smiled. “Anything else we need to talk about before you go?”

Em looked around. Everyone seemed absorbed in their packet. She knew that Sarah’s strength was science and that Tammy had technology, but she wondered what Ms. Neil could have seen in Abby to invite her to join the team.

Chapter 4: Tammy

“I don’t think Emily likes me very much.” Abby sat in the chair next to Tammy. They had
been put into the same small group in their history class today.

“Em?” Tammy was preoccupied with what her parents had talked to her about the other day. She was debating whether she should call Timmy and Tommy for help, but knew they would probably be too busy with college stuff.

“Yeah. She didn’t seem happy at the meeting yesterday.” Tammy really didn’t want to talk about her best friends, especially with Abby Andrews.

“Hey guys,” Mags slid into the other chair at their table.

“Girls,” Abby snipped. Tammy was beginning to think that it was just the way Abby talked. Maybe she wasn’t trying to be mean, it just came across that way.

“What?”

“We’re girls, not guys.”

“Oh. Ok,” Mags blushed and pulled out her notebook.

“We’re supposed to be talking about our history projects,” Tammy tried to change the subject. “Have you guys picked out what you are going to write about?”

Tammy saw Abby roll her eyes and smiled.

“I’m doing my project on Miriam Mirzakhani.”

“Who’s that?” Tammy asked.

“She was an Iranian mathematician. I watched a BBC special about her,” Mags said. “She solved all these mathematics puzzles that were thought to be unsolvable and she was a professor at Stanford.”

“Cool,” Tammy said. “I still haven’t picked anything.”

“Are you a big math Nerd?” Abby asked Mags.

“What are you interested in?” Mags asked, ignoring Abby.
“Oh. Tammy is the school’s tech guru,” Abby didn’t look up from doodling on her paper.

“She can do anything with computers.”

Tammy didn’t like the way Abby said that, did she know something she shouldn’t?

“Really?” Mags seemed interested. “I’m hopeless around technology. My sister says she is surprised sometimes that I can even make a phone call. It seems like anything I touch just breaks.”

“It’s not that hard.” Tammy’s Mom said she had been born with a phone in her hand. If she didn’t have a phone, she was on her computer, programming or taking apart and fixing anything electronic in their house. Timmy and Tommy had come home from school one day when Tammy had just turned five to find their game console in pieces spread out across the dining room table. They had been complaining that all the games were glitching, so Tammy decided to fix it herself. When she was done, the games worked even better than new. “I just like to play around with all different types of electronics and stuff.”

“That’s so cool. Maybe you could teach me something.”

“I’m sure she could teach you a lot about hack--”

“What is your problem Abby?” Tammy interrupted, she didn’t want Abby to finish that sentence.

“Nothing.” Abby held up her hands, smiling. “So are you a big math nerd Margaret?”

Tammy looked over at Mags, she looked like she was about to cry.

“Excuse me.” Mags jumped up from the table and walked to the front of the room. After talking to the teacher she walked out holding the bathroom pass, a giant glittery pink key.

“Why did you have to do that?” Tammy asked Abby.

“What?” Abby tried to look innocent.
“You know what you did. Are you really this mean, or is it just an act for you and your snobby friends?” Tammy followed Mags out of the room not looking back at Abby’s surprised face.

“Tammy you need a pass…”

She ignored Ms. Forward and kept going to find Mags. It didn’t take her long to find her locked in one of the bathroom stalls of the closest girl’s room crying.

“Mags?” She tapped lightly on the grey metal door. The crying turned to sniffles.

“What do you want?”

“I just wanted to see if you are ok?”

Tammy took a step back as the door swung open. Mags’s usually clear eyes were rimmed with red and her perfectly slicked-back bun was fraying at the edges. She looked a mess, well at least messier than Tammy had ever seen her. Tammy suddenly felt bad that she hadn’t been the nicest person to Mags.

“Look at me,” Mags cried. “I know I’m a walking, talking cliché. I’m good at math, I play the piano, I listen to my parents and get straight A’s!”

“Mags…” Tammy tried to interrupt.

“I’m A.B.C,” she kept going, “I know that’s why no one likes me. I like school, I get good grades, and I’m the new girl on top of it all!”

“But, Mags—”

“You don’t have to like me, we don’t have to be friends, but we do have to work together…in STEAM club and in tennis.”

“MAGS!” Tammy shouted.

Mags clamped her mouth shut.
“I’m sorry if I wasn’t very nice to you before, but I would like to be your friend.” Tammy waved her hand in front of the paper towel dispenser and it made a whirring sound. She ripped off the paper towel and handed it to Mags. “And don’t listen to Abby, she’s just a mean girl.”

“Thanks.” Mags dabbed her eyes with the paper towel and blew her nose.

“It is nice to know that you’re not perfect though,” Tammy said.

“Don’t tell anyone.” Mags gave her a small smile. Tammy laughed.

“And what is A.B.C. Anyway?”

“American born Chinese,” Mags sniffled again.

“Oh,” Tammy said. “I don’t know anything about being the new kid, since I’ve lived here my whole life, but I do know about being different.” Tammy looked into the mirror on the wall above the sink and caught Mag’s eyes. As different as they looked from each other, at that moment Tammy knew, they were exactly the same in so many other ways.

“Friends?” Tammy asked.

“Friends.” Mags agreed. “Now, do we have to go back to class?”

“That would probably be a good idea.”

Ms. Forward looked at Mags when they both walked in and didn’t say anything about Tammy running out of the room. Being a good student had its perks.

Tammy glared at Abby as they sat down, daring her to say anything else about Mags. Abby’s eyes darted to Mags and Tammy thought she saw a hint of regret in them, but it was gone as soon as she noticed it.

“So, I’m going to do my presentation on Joan Beauchamp Proctor,” Abby said, as Ms. Forward walked past their group. “She was a zoologist who used her art to create better habitats—”
Tammy was saved from trying to keep the conversation going by the bell for class to end. Abby jumped out of her chair and was out the door before Tammy had even put her notebook and pens back into her dark green backpack. Her backpack seemed to get heavier and heavier every day—filling up with the never-ending homework and books.

“Maybe you could come over and study with me sometime after tennis,” Mags said hopefully.

“Of course.” Tammy smiled and hefted the bag onto her back. “That would be fun.”

Chapter 5: Emily

Em steered her bicycle into the driveway. Her house was only a couple of blocks from school, so most of the time she rode her bike. Her mother had only let her start doing that in seventh grade. Before, her mom had always walked her to school with her little brother and sisters in tow.

George was eight and Paige was six. They were both in elementary school, which was just a little further down the road, but still walkable. Julia was only one, so she rode in the stroller or Em’s mom wore her strapped to her back.

Emily unbuckled her helmet and pushed her bicycle the rest of the way into the garage, past her mom’s parked van. The car didn’t get used much since the grocery store was only a five-minute walk away. Em’s mom stayed at home with the baby and her dad was out of the country with the military.

Em thought back to the first S.T.E.A.M. meeting a couple days ago. She pulled out her
phone as she opened the door to the house and sent Sarah a quick text. She hadn’t been able to talk to Sarah since the meeting and was really upset that Sarah hadn’t backed her up.

Em’s brother and sister were busy watching some baby cartoon on the television when she got inside.

“EMMY!” Her sister, Paige, jumped up off the couch and bounded over to her. “Guess what we did today?”

This is how all her afternoons went, unless she had S.T.E.A.M. club to go to. Her mom didn’t have time to drive her around to all kinds of after school activities because she was taking George to therapy almost every day. And Em couldn’t think of one she would really want to go to, even if she could. She would get home, her mom would be starting dinner, her brother and sister would smother her and not stop talking until they had food in their mouths.

“What?” Em said in an annoyed tone. She didn’t mind them most of the time, but today she wanted to be alone.

“At school Josie and Lila were swinging on the icky swings, you know, the two swings at the end of the line where the giant mud puddles are. Anyways, they really wanted to swing.” Paige rolled her eyes at this like swinging was the stupidest thing in the world to do, but what was she going to do about it when her two best friends refused to listen. “So, they were swinging and Blake came over and started telling us how he had eaten two worms because Adam had bet him he couldn’t.”

“Uh-huh.” Em was half listening as she slipped off her shoes and hung her backpack up on her hook. Once Paige started talking it was hard to make her stop, it was better just to let her run out of steam herself. Em thought of her like a giant balloon filled with air, she had to let air out of it once and a while or it would just explode.
“Then he asked if we wanted to smell his worm breath. We all screamed and Lila and Josie jumped off the swings and we ran away as fast as we could. You know what he did?” she didn’t give Em time to answer. “He took Lila’s swing and his gross best friend Adam came and took Josie’s!”

“Yeah.” Paige didn’t even notice that Em was barely listening.

“So we made up a song about him. Want to hear it?”

“Sure,” Em went into the kitchen, her sister following closely behind.

“Blake and Adam ate a worm, ate a worm, ate a worm. Blake and Adam ate a worm and now they both have germs! Blah! Blake and Adam ate a worm, ate—”

“Paige, I asked you to stop singing that song.” Em’s mom looked up from the cutting board and pointed at Paige. “Please.”


She bounded out of the room and it was silent.

“That girl never stops talking, it’s a wonder she doesn’t get notes sent home from the teacher every day.”

“Maybe she just saves it up all day and explodes when she gets home.” Pop, like the balloon.

“Maybe.” Her mom seemed preoccupied.

“Did Dad call today?”

“Not yet. I got an email from him. He said he might be able to Skype with us later, that would be nice, wouldn’t it?”

“I’d rather just see him here,” Em took an apple from the fruit bowl on the counter and took a huge bite.
“I know honey, but this will hopefully be the last time he’s going to have to be out on deployment this long. We all miss him.”

“He’s been gone almost six months.” Em knew she was whining now, but she couldn’t help it. It wasn’t fair. She just wanted her dad to be able to come home.

“Well, he only has four weeks left and he should be getting his new assignment any day, so then we’ll know what to plan for.” Her mom came over, kissed her on the head and went back to chopping veggies.

Em took her snack with her to her room. It was the first room at the top of the stairs. She loved it because the window looked out the front of the house. Past the street was city park. It was always filled with life—people walking their dogs, birds and squirrels flittering about, and kids running every which way. The window was a bay window and popped out creating kind of a nook where she could sit.

Where her friends always had their laptops up on their desks, Em had a jumble of what looked like old junk and tools. All of her walls were covered with posters of the space station and How Things Work, instead of boy bands and kittens, like most of the girls in her grade.

She sat down on the window bench and looked outside. Then her phone buzzed in her pocket.

I’m fine. U? Sarah texted back.

Ok, just need 2 talk. Em answered.

Sarah didn’t answer for a couple of minutes. Em pulled her sketchbook off her desk and opened it to the page she had been working on the week before. She always kept quick notes of the ideas for inventions she had during the day, on her phone. When she thought an idea had promise, she would sketch and doodle and write pages and pages about it. Some of her
inventions were only theoretical, she knew they would never be made, like her mind reading gum. But that didn’t stop her from writing and drawing all about them.

Meet me at the diner tonight around 7.

K. She quickly typed back. The diner was where Sarah’s mom worked as a waitress and was only a couple of blocks away from Em’s house. She was sure her mom would let her go when they were done with dinner.

Em went back to her notebook. She kept having problems when she was designing lately. She was trying to build something to help her mom get the groceries from the garage to the fridge. She had sketched out a conveyer belt, but didn’t think it would be practical to have conveyer belts all over the house. Although it would be nice to have one to bring the laundry up from the basement.

Another idea pepped into her head. She had been thinking of her sister like a balloon that could pop at any minute. What if she used balloons to make things zip along strings through the house. She could see a giant balloon zooming into her room to announce that dinner was ready.

“Dinner,” her mom called from downstairs, as if reading Em’s mind. Em looked down at her watch. She couldn’t believe it was already six. She hadn’t even started her homework.

The dinner table was pretty quiet. Paige and George were busy stuffing their faces with the roasted broccoli, their favorite food, for reasons Em couldn’t understand. She just pushed hers around the plate, not really hungry, her mind still in the clouds.

“Done!” Yelled George. He threw his hands up into the air. He had eaten everything on his plate.

“Second,” Paige said while crunching on the last piece of broccoli. It was always a race for them to see who could finish dinner first. Julia babbled and threw broccoli at them all. Em
knew the feeling. At least Julia understood her.

Em speared a piece of chicken and popped it into her mouth.

“Can we be excused?” George said, not waiting for an answer. He picked up his plate and silverware and took them to the kitchen. Paige followed him, and Em could hear them bashing their plates around trying to get them into the dishwasher first.

“Make sure you get everything into the dishwasher,” her mom yelled into the kitchen and then slumped down in her seat. Em could see how tired she looked, see the lines on her face, even more pronounced than they seemed to be this morning.

George and Paige ran back into the dining room.

“Can we go outside?” They were both bouncing up and down on their toes. Em could see why a lot of people mistook them for twins. Even though George was a year and a half older than Paige, they were about the same size.

Em remembered when George was born and how he had spent the first couple of months in the hospital. Now, because he had been premature, he spent half the day at school in the Special Education room and the other half in the first grade classroom.

“Go ahead. Just stay in the back yard.”

“Thanks, Mom,” they both yelled and ran out of the house.

“So, how was your day?” Em’s mom asked her. Julia tried a piece of her broccoli instead of throwing it, she made a very odd face.

“Ok.” Em kept pushing around her food.

“Just ok?” Her mom raised her eyebrows. Em was about to answer when the family computer in the living room started ringing.

“It’s your dad, he’s calling a bit early.” She looked at her watch.
“I’ll get it!” She jumped up and ran to the living room. Em always missed her dad. He was the one person, besides her friends, she felt understood her. Her mother was great and everything but it wasn’t the same. She was always busy taking care of Paige, George, and Julia but Dad made time just for Em whenever he was home.

“Hey Dad!” She pushed the answer button.

Her picture showed up in the bottom right hand corner of the screen. Her father’s face filled the rest. He looked a little thinner than he had a couple of weeks before, the last time she had gotten to Skype with him. His chocolate brown hair was speckled with grey, like a robin’s egg was with black. His face was the same oval shape as Emily’s and his eyes were the same light grey-blue color. The connection was staticking in and out.

“Hey, Munchkin.” She could see her own lopsided smile mirrored back to her on his face. Emily instantly felt better than she had in days. “How’s it going?”

“Not bad.” She tried to think of things she had been wanting to talk to him about, but it had all flown out of her head when she saw his face.

“Well, I have some good news, is your mom around?”

“I’m here.” Her mom came up behind her and leaned over so her head was visible in the small video box. She was carrying Julia on one hip and the smile she was wearing erased all the lines Em had noticed earlier.

“I’m going to be transferred back home early.”

“Really honey? That’s great!”

“Yeah. I’m not in Afghanistan or anything, but I miss home a lot.”

“Really?” Em was excited. “When?”

“Well, Munchkin, that’s the best part.” He smiled again, “eight days!”
“So you’re going to be home soon?” Emily could barely stay in the seat. “You’re going to be home in time for my birthday. And you’re going to be able to come and see my S.T.E.A.M. Competition!”

“That’s the plan.” He gave her a big smile.

“Yay! I have so many inventions waiting for you when you get home. I have to go work on them right now! I’ll see you soon, Daddy.” Em didn’t wait for his reply. She jumped out of her chair and ran up to her room. She felt light as air, like she was a balloon zipping along strings that weren’t yet there, zipping straight to her room.

“Oh, that’s so great, honey.” Em heard her mom say in the background.

“Dadada,” Julie babbled.

Chapter 6: Sarah

Sarah’s legs stuck to the rust-orange vinyl booth in the diner. No matter what the temperature, hot or cold, it always happened. She had her school laptop out in front of her and was trying to concentrate on getting some of her history project done. She saw her mother across the room carrying five hot plates balanced precariously up her arm. Sarah knew it must be hard, but her mom made it look effortless.

Her mom made everything look effortless. Sarah, who had inherited almost everything from her father, couldn’t imagine looking like that. So at ease, so relaxed. She felt like all arms and legs that didn’t want to coordinate with each other. Not only did she have to live up to her mom, but she had to live up to her friends as well.
She picked up her fork and took a bite of the deep purple pie on her plate. It was sweet and silky smooth, like a pumpkin pie. The crust was spicy and nutty, the perfect compliment.

From Sarah’s booth she could see everything in the diner. To her left was the kitchen. Brian, the head chef and owner, was always there. He had bought the restaurant about five years before and turned it from a greasy spoon that no one ate at, to a greasy spoon that everyone loved.

“Hey, Mom.” Her mom deftly slid past the booth and toward the kitchen to pick up the next order.

“Hey, sweetie.” Her mom gave her a nod, “I’ll be back in just a minute.”

“Just tell Brian this purple sweet potato pie is a keeper.” She pointed to the pie with her fork.

“Will do.” She smiled.

The main thing people flocked to the restaurant for was the pie. Brian’s pies were famous and he was always coming up with new ones. Sarah was his favorite test subject.

It wasn’t always the best job. Spicy pickle cheesecake and the green grape pies were in the top five worst things she had ever tasted. The vinegar pie and the cheddar pear pie were surprisingly good and both pretty popular on the menu. Her two all-time favorites were the simple pumpkin pie and the lemon blueberry cheesecake.

When she asked, and the diner was slow, Brian would even teach her to bake. She loved how it was similar to Chemistry class. Measure simple ingredients, mix them together, add heat, and voila.

She pulled out the packet of information that Ms. Neil had given her at the S.T.E.A.M. meeting. She hadn’t had a chance to look at it and wondered what she needed to start studying.

“Whoo,” Sarah’s mom sat across from her in the booth. “My dogs are barkin’.”

Sarah didn’t say anything, her mom said that every night after a long shift, and Sarah was
still thinking about the S.T.E.A.M. club.

“Earth to Sarah.” Her mom waved her hand in front of Sarah’s face to get her attention.

“What, sorry?” Sarah shook her head.

“Nothing. How’s your homework coming along?”

“Not bad.” Sarah looked at the blank page, the text cursor blinking at her. She was supposed to be writing a three-page paper for her Social Studies class. She had checked a book out of the library called Women in Science: 50 Fearless Pioneers Who Changed the World, written by Rachel Ignotofsky. Sarah was flipping through the pages, looking at the awesome illustrations and one page caught her eye.

Marjory Stoneman Douglas was a famous writer and conservationist. When Sarah researched she found that Douglas had started the “Friends of the Everglades” and saved the Florida wetlands from being destroyed.

Ding. The bell rang over the door.

“Duty calls. I’ll be back when I get another minute,” her mom said.

“Ok.”

Sarah thought back to when her father had taken her to the Florida Everglades. He was driving her to Space Camp for the first time when she was nine. Her mother had gotten her a digital camera and she was taking pictures of everything.

They pulled over at a state park in the Florida Everglades and went for a hike. Back in the forest they saw a huge tree with gnarled limbs pointing this way and that. They climbed up in the tree together and another hiker had took their picture. Sarah was smiling at the camera, but at the exact moment the picture was taken, a squirrel jumped down on the branch right next her dad and he was startled. It looked like he was about to fall out of the tree. Every time she saw the
photo, it made her laugh. After he died, she shoved the picture, frame and all back into the
bottom of her closet.

She had forgotten about it until one day this past summer when she was digging in her closet
to pack her bag for camp and found it. The glass had shattered in the frame, but the picture was
fine. She pulled it out of the frame and stuck it in her bag. It didn’t make her mad like it had
before. It made her a little sad, but she could remember the memory now without crying. She
remembered the exact second after the picture was taken.

Her father had screamed and dived out of the tree. She started laughing and couldn’t catch
her breath. The squirrel didn’t even seem to know they were there—it just continued up the
branch with the nut in its mouth, like nothing had even happened. Her dad just lay on the packed
dirt path under the tree and looked up at her, smiling.

“Hey,” Abby stood next to the booth.

“What are you doing here?” Sarah said.

“Oh, my dad is just picking up some dinner, and a whole lemon meringue pie of course.”

“Uh-huh.”

Abby was acting like it was totally normal for her to come up to Sarah in public and talk.

“Working on homework?”

“Kind of.” Sarah figured if she kept giving her short answers, maybe she would go away.

“It would be hard to work in all this noise.” Abby looked around the diner. Almost every
booth and table was full.

“It’s not the noise, I just can’t concentrate. I miss my dad and I feel really bad about making
fun of Simon.”

“Who?”
“Simon was this boy that went to elementary school with us. It’s a long story.”

“Oh, ok.” Now it was Abby’s turn to look awkward. “I guess—”

“Abby, let’s get going,” Abby’s dad held up the white take out bags, stuffed full of food.

“Ok, be right there,” she yelled over to her dad then turned back to Sarah. “I guess I’ll see you at lunch tomorrow.”

“Bye.”

“Um, could you tell Em that I’m sorry about the…about what happened last year. It wasn’t my idea and, well, just tell her I’m sorry.” She turned and quickly ran out of the restaurant.

What was Abby trying to do? It almost seemed like she wanted to be Sarah’s friend. It also seemed that she was being genuine in her apology. Sarah needed to tell Em asap.

“Sarah?” Her mom was standing in front of the booth and waving to get her attention.

“What’s up?”

“Nothing, just thinking,” Sarah said. She looked closely at her mom. Her mousy brown hair was tied up into a messy bun. Her dark blue polo shirt fit perfectly with her jeans and off-white half apron. She had a pen tucked behind her ear.

Her mom looked like she was going to say something but the bell over the door chimed, announcing a new customer. Sarah looked, but it wasn’t Em.

“Sorry honey. I’ll be back as soon as I can.” Her mom patted her hand and walked away.

“Fine.” Sarah was upset. She just wanted to be able to have a normal conversation with someone. She looked at the time on her computer. It was 7:30 and Emily was late.

Where r u?

…

Sarah waited for a reply, but it didn’t come.
It seemed like her best friend, like her mother, didn’t have time for her any more. She would just have to try and fix her problems all by herself.

Chapter 7: Tammy

“We only have thirty minutes for lunch,” Em said.

“We know,” Abby sighed.

“Guys let’s just try to focus,” Sarah said quietly.

Tammy didn’t trust herself to open her mouth around Abby. She was still mad about how Abby had treated Mags in class and she had a feeling that Abby knew something about what Tammy did on the school computers.

“I hope you all have had a chance to look over the information I gave you all,” Ms. Neil said from the front of the room.

Tammy pulled her battered copy out of her bag. It had been shoved to the bottom of her bag and smooshed beneath heavy books. She tried to smooth the packet out as best she could, when she saw that everyone else’s looked brand new. She hadn’t had a chance to look through it with tennis practice every night and her homework piling up.

It wasn’t like her to be so disorganized and behind, but she couldn’t seem to catch up this year, no matter how hard she tried.

“The format for the tournament on Saturday is exactly how I outlined it. Does anyone have questions about that?”

Abby crunched down on a baby carrot. Sarah broke her cookie in half and handed part of it to Em. Tammy got her lunch box off the floor and zipped it open. No one raised their hand.
“No,” Ms. Neil said. “Ok, good, we can dive right in. Today we are going to break into groups and quiz each other. How about Sarah and Abby, you two can work together -- and Tammy and Emily, you two work together. Mags, you will be with me.”

Ms. Neil handed them each a stack of notecards with questions written on them.

“This is so pointless,” Tammy heard Abby say as she stood up and went to another table with Sarah.

“I’m so glad I’m not partnered with her,” Tammy whispered to Em.

“Me too,” Em said.

Tammy pulled her sandwich out of her lunch box and took a bite. Turkey, mozzarella and lettuce on whole wheat, her favorite.

“First question.” Em looked down at the first notecard. “What is firmware? A. A program you load on a machine to serve as the operating system, B. How you connect a machine to a wireless controller, or C. A part of the machine that is very hard?”

“A,” Tammy answered, her mouth still half full.

“Correct.”

“The Three Laws of Robotics were created in 1941 by whom?” Tammy asked Em her first question. “A. George Gamow, B. Isaac Asimov or C. Albert Einstein?”

“B.”

“You are right,” Tammy said.

Em took a drink out of her reusable water bottle.

“Are you excited about the competition tomorrow?” Em asked.

“Yeah, it should be fun,” Tammy said.

“Sarah’s nervous about getting up in front of a lot of people.” Em took another sip, “And I
really don’t like having Abby on our team.”

“Me either.”

“What did she do to you?”

“She upset Mags yesterday,” Tammy said. “Made her cry in History.”

“Seriously?” Em looked aghast. “She can be so mean.”

“I know.”

“Second question: When the Egyptians were creating their murals they used what two things?” Em asked. “A. Horse hair brushes and acrylic paints, B. Mud and sand or C. Semi-precious stones and gold.”

“C,” Tammy answered.

“Correct again.”

“So.” Tammy looked around to see if anyone was listening in, “My parents talked to me and said that Mr. Gregson knows that someone broke into the school computers over the summer.”

“Do they know who it was?” Em’s eyes went wide.

“I probably wouldn’t be here if they did,” Tammy said. “I know I’m going to be expelled.”

“But you were just trying to stop something awful from happening. It wouldn’t be fair!” Em took a bite of her lunch.

“It was something awful that was going to happen because of me.”

“Do you think they will be able to figure it out?”

“I think I covered my tracks, but I’m going to check it out if I get a chance.”

“Will they know that I helped you?”

“I won’t tell them,” Tammy said. “There’s no point for us all to get into trouble, Sarah too.”

“Thanks,” Em looked over to where Sarah and Abby were reading off questions. “Do you
think there’s something up with Sarah?”

“Like what?” Tammy asked.

“Ever since she got her braces off she’s been acting weird.”

“She asked the same thing about you,” Tammy said. “Maybe you two should talk to each other about this.”

“Do you girls have any questions?” Ms. Neil came over to their table.

“No,” they both said.

“Okay,” Ms. Neil smiled, her brown eyes shining behind her brown tortoise-shell glasses. Tammy noticed that she always seemed to be happy, even when you could tell she was upset about something. That was something Tammy loved about her, it was nice to have such an upbeat and positive teacher. “In about two minutes we are going to have a talk as a group.”

Tammy finished off her sandwich while Em asked her another question.

“True or False. Sea turtles can retract all four legs and their heads into their shell.”

“Um.” Tammy wasn’t sure, “true?”

“Nope, false.”

“Really?”

“Yep,” Em crunched down on a chip. “It says that a sea turtles shell is streamlined and its flippers are flattened so they can move faster in the water, but can’t pull them into the shell.”

“Let’s all come and sit over here.” Ms. Neil gathered them over to one of the bigger lab tables, “tomorrow we have our first competition. I know that we haven’t had a lot of practice, but I think this match will be a great way to show us what we need to work on. We will have three or four rounds depending on how well you do.”

“What should we wear?” Mags asked.
“Well, since we don’t have shirts or uniforms maybe we should all just wear something we are comfortable in. After this weekend we can talk about getting some matching outfits. Ok.”

Ms. Neil adjusted her glasses, “any other questions?”

“No, well I think you all just need to try and look through the packet I gave each of you, to get refreshed on the rules of the competition and some of the topics that come up more than others.” Ms. Neil looked like she was about to dismiss them, “oh, and also, I almost forgot. We will have one more tournament in two weeks and then regionals will be a couple of weeks after that. Regionals are in Charlotte at the Embassy Suites hotel. I’ll have a parents’ meeting soon so we can figure out who will be chaperoning and get permission slips signed.”

“Awesome,” Em said. “Doesn’t that hotel have a pool?”

“Yes, I think it does have an indoor pool.” Ms. Neil smiled, “it should be a lot of fun, but for now let’s just try to focus on this weekend, ladies.”

Tammy was excited too, but she felt the mounting pressure as she added the dates into her planner. Her to-do list was getting longer and longer.

Chapter 8: Emily

Emily glanced around nervously, her blonde ponytail slapping on her back. The small auditorium of Saint George Middle School was starting to fill up quickly. Kids from other schools in matching shirts sat close together in the front couple of rows talking and laughing. Parents filled in the back seats looking down at the flyer outlining the day’s schedule of events or their phones.
She tapped the end of her lucky rainbow glitter pencil on the wooden table. It was a pencil that she had designed herself, using the pink goop they made dental impressions with at the dentist’s office, to be more ergonomic. She never got hand cramps on long essay tests anymore, and now she carried it wherever she went.

“Everyone ok?” Em asked.

“Yeah.”

“Yes.”

“Of course.”

Sarah just nodded. Em could see the nerves starting to show on everyone’s face. She could feel them too. It made her stomach feel like she was free-falling through the air. Just like her egg must have felt in the contraption they built for the egg drop in science class. Her egg was able to drop twenty feet more than anyone else’s before it broke. It was a school record.

She leaned forward and looked down the line. Beside her was Margaret, looking smart as ever. Perfectly tailored in an off-white, button-down shirt and knee-length black skirt. Her silky black hair was pulled back into a tight bun that accentuated her dark-brown eyes.

Mags was muttering numbers under her breath and Em knew she was trying to think of all the equations she might need to know in the next hour or so. It was the team’s first official S.T.E.A.M. competition and they were all nervous, except for maybe Abby, she didn’t seem like she cared about any of it.

At the head of the table was Abby. Like Mags, her hair was up in a bun, but that is where their similarities ended. Abby’s curly rust red hair made her bun look disheveled. Her green eyes were wide and large, taking in everything around her, always inquisitive. Her clothes draped around her loosely, the large bright patterns clashing, yet somehow working perfectly together.
Suddenly the lights over the audience dimmed and a small bearded man walked out onto the podium in the middle of the stage. Everyone stopped fidgeting at once and looked up. Em noticed the team across from them all were boys wearing matching uniforms: light tan pants and dark blue polo shirts with their school logo emblazoned in gold on the pocket.

Em thought her team looked uncoordinated and amateurish compared to the other team. Someone poked her. Sarah, who was on her right, leaned over and put her hand up to Em’s ear.

“Is that Simon over there?” She pointed over to the other team.

“Who?” She was too distracted to think, trying to listen to what the moderator was saying.

“Never mind,” Sarah sat back in her seat.

“Welcome to the second annual Middle School Western Carolina S.T.E.A.M. Competition. This year we have five teams competing. Each team will play three rounds and the two teams with the highest scores will go onto the finals. So students,” he looked over the two teams sitting around him, “remember that every question and every point counts, even if you lose a round, you could still be in the finals.

“I will read the questions and the first team to buzz in will have a chance to answer the question for full points. If you get a question wrong, the other team will have a chance to steal the points. If you answer a question correctly then you will get three bonus questions. The questions will start out easy and get harder as the match goes along. There are thirty toss-up questions total with a five-minute break in the middle. So let’s start our first match: Polk County Middle School S.T.E.A.M. Team vs. The Galloping Ghosts of Saint George Middle School. The S.T.E.A.M. Team is represented by Abigail Andrews, Margaret Mu, Emily Eckart, Tammy Travis and Sarah Spade. The Ghosts are represented by Simon Fisher, Gregory Jenkins, Andrew Henderson, Jackson McKay and Michael Wilde.”
There was a round of applause from the audience. All five girls picked up their buzzers. Ms. Neil had told them what the competition was going to be like, but it was different actually being up on stage—more intimidating. Em just had to remember she could buzz in at any time, each toss-up question was worth ten points and had to be answered by the person who buzzed in, and bonus questions were each worth five, but you could all work together to figure out the answer.

“Question number one. This branch of science is concerned with poikilothermic and ectothermic tetrapods. The word is Greek for ‘creeping animal’ and subfields include Cheloniology the study of turtles and tortoises—”

Buzz.

“Galloping Ghosts,” the moderator acknowledged the team.

“Herpetology,” a small boy with wire-rimmed glasses chirped.

“Correct. Now for your bonus questions. This type of frog is most commonly found in the rainforests of Central America.”

A picture of a green frog with large red eyes, webbed orange feet and blue and yellow vertical stripes down its body appeared on the screen behind the moderator.

The boys all huddled together and whispered. The boy at the head of the table looked up.

“A red-eyed tree frog,” he enunciated clearly.

“That is correct.”

The Galloping Ghosts answered the next question correctly and then missed the last bonus question. Em sighed, they were up twenty points.

“I’m sorry,” Sarah whispered. Em turned to see that Sarah looked stricken. Science was her area of expertise and Em knew she was embarrassed to miss the buzz-in on the question.

“Don’t worry about it,” Em said. “You’ll get the next one.”
“Question two. This type of computer memory can only be modified slowly, if at all. Unlike its counterpart, RAM or Random-access memory—”

Buzz.

“S.T.E.A.M. Team.”

“Read-only memory,” Tammy answered quickly.

“Correct, now for your bonus questions. Question one, this type of computer code is the easiest to read out of the programming languages that can run on a wide range of platforms.”

They all looked down at Tammy and leaned in so they could hear.

“It’s either Java or Python. Java is mostly used for androids. I think it has to be Python.”

“Ok.” Abby sat up straight. “The answer is Python.”

“Correct for five points.” There was polite clapping from the audience.

The girls got the last two bonus questions correct. They were up twenty-five to twenty. Em felt like the questions were coming faster and faster. After the first fifteen toss-up questions, the Galloping Ghosts were leading by twenty-five points. She couldn’t believe the first half was already over.

Ms. Neil walked onto the stage and handed all the girls small water bottles.

“You’re doing a great job.” She smiled, “just trust what you know and you can beat them.”

“But I missed that easy science question,” Sarah said.

Em looked up at the projector screen. They only had two minutes until the second half started.

“We’re all going to miss questions,” Mags said. “But as long as we are trying our best, we’ll be fine.”

Em could tell that Sarah wasn’t listening. She looked like it was the end of the world for not
buzzing in on time.

“Sarah, let’s talk for a second.” Ms. Neil pulled Sarah off to the side. Em wondered what it was all about. She and Sarah were best friends, they usually told each other everything. But for the last couple of days, Sarah had been distant, hadn’t wanted to talk.

Em tried to listen to what Ms. Neil was saying, but she couldn’t hear her over the babble of the crowd.

“We got this,” Tammy said, like they were lining up on the football field for a last-ditch play. Em didn’t know what the other girls had been saying. The buzzer rang and she made her way back to her seat, taking a sip of water on the way.

Sarah sat down and Em thought she looked a little better, but not much. Em tried to give her a reassuring smile. Sarah didn’t look at her, but up at Abby. Abby gave Sarah a thumbs up.

Right now she wished she had invented something that could read minds or even just get someone’s attention without anyone else knowing. She wanted to figure out why her best friend was being nice to the enemy. Em thought they both hated Abby.

“Question sixteen.”

Em shook her head, she really needed to focus on what was going on, she could work on mind reading later.

“This structural element can be used in buildings, airplanes, towers, and bridges. The most famous example is in Frank Lloyd Wright’s house Fallingwater, located in Pennsylvania. It is anchored on one end and protrudes—”

Emily buzzed in.

“S.T.E.A.M. Team.”

“Cantilever,” Em said with confidence. Her grandfather was an architect and for Christmas
last year he had gotten her the LEGO Architecture set of Fallingwater. She smiled thinking of how she spent the whole day putting it together, the cantilevers had been the trickiest part because they were long beams that stuck out from the building and weren’t supported by anything.

“Correct. Bonus question one. Name the Frank Lloyd Wright house that was his primary residence near Spring Green, Wisconsin.”

“Taliesin.” Em answered.

“Correct.”

“Bonus question two. Frank Lloyd Wright designed this art museum in Manhattan.” Up on the projector screen a picture of the rounded white bowl like building.

“The Guggenheim,” Em answered again.

“And the last bonus question…

Chapter 9: Tammy

“…Looking at this stained glass window, designed by Frank Lloyd Wright, give one of his main inspirations.”

Abby, not Em, spoke up at this one.

“Shapes and colors he found in nature,” she articulated.

“Correct.”

Maybe Abby was paying attention, but just because Abby answered a question right didn’t mean Tammy had to like her.

Tammy could see her mom and dad out in the audience smiling at her. She waved to them.
Her mom waved back and her father gave her a thumbs up. She only wished her brothers could be here.

They had always been her biggest supporters. Cheering the loudest, even when it was inappropriate at her tennis matches. Anything more than polite clapping was inappropriate during a tennis match and Timmy and Tommy had never figured out how to be quiet (least of all subtle).

Tammy turned back to focus on the match. The questions kept coming and the teams were neck-and-neck. Tammy felt the pressure mounting as they got closer to the end of the round.

“Question twenty-six. We have another math question here. How many pumpkins are in two tons of pumpkins averaging twenty pounds each?”

Tammy was still trying to figure it out when she heard a buzz.

“S.T.E.A.M. Team.”

“Two-hundred,” Mags said confidently.

“Correct,” the moderator said. “Now for the bonus questions.”

Mags got those right as well.

“Currently the score is 245 for the Dots to 260 for the Ghosts. We have four questions left so it is anyone’s game.”

Tammy tried to concentrate, but her mind kept straying to all the tests and schoolwork and sports she had in the upcoming week. School had only started two weeks before, but she already had a book to read for English class, two tennis matches, a lot of math homework…she shook her head.

She needed to concentrate on this match. S.T.E.A.M. Team practiced once a week and even though it was hard, she wanted to be a part of it. She looked back up to the moderator.
“It looks like this round will come down to the final question. The score right now is 270 for both teams. Whoever gets this last question correct wins. Here we go, question 30. This type of energy can be transferred by radiation, convection, and conduction. When applied to matter this property changes it from solid to liquid and from liquid to gas.”

Buzz.

Tammy looked down to Sarah. She knew the answer and had been about to buzz in, but she figured Sarah had beaten her to it.

“Dots.”

“Um…” Sarah stuttered a bit. Tammy could see the fear in her eyes. She could tell that Sarah knew the answer, but the word had slipped out of her mind.

“You have five seconds.”

The time slipped by slowly. Tammy willed the word from her brain into Sarah’s mouth, but they didn’t go. Heat, heat, heat.

“Uh…” Sarah said again.

“Times up. Ghosts, you have a chance to steal the points for the win.”

“The answer is heat.” One of the boys, with slicked-back black hair answered smugly.

Tammy looked at him, he looked vaguely familiar, but she couldn’t figure out where she knew him from.

“Correct. The Galloping Ghosts win the match.”

Tammy’s stomach sank. She never thought that they would lose and she didn’t like the feeling. Why couldn’t Sarah just get that question right? Tammy had spent all that time practicing and preparing and now they had lost.

“Thank you teams, that was a close one. Our next match will begin in twenty minutes. It will
feature the Hendersonville Hornets versus the Bridgeport Banana Slugs.”

“Holy Annie Easley, Batman,” Tammy was looking at a screen full of code on her computer. She preferred working on her desktop at home than the old school laptop. She had designed the whole thing and Em and Mr. Eckart had helped her put it all together.

“Holy what?” Mags was perched on the end of Tammy’s bed flipping through the newest issue of U.S. Tennis Magazine on her tablet.

“Annie Easley.”

“Who’s that?”

“She was a computer programmer and rocket scientist in the 50’s. She was pretty badass.”

“Language.” Tammy’s mom walked by her open door carrying a basket of clean and folded laundry.

“Sorry, Mom,” Tammy yelled back.

“Are you going to do your history presentation on her?” Mags asked.

Tammy swiveled in her chair.

“Probably. When is that due?”

“Next week,” Mags said, not looking up from her article.

“Are you serious?”

“Yep. Three-page report, a visual aid and a ten-minute presentation on a person from history who influenced you and your passions.”

“Ugh. I totally forgot it was that soon. Can you send me the deets?”

“Sure.” Mags tapped on her tablet screen a couple of times and Tammy’s phone chimed.
“Thanks.” Tammy brought up the link that Mags had sent her. She added the date to the scheduling app she had designed last year, not that it helped much when she forgot to check it for her assignments. The app had won her the science fair though. All the schools in the county had adopted it for use by the students and teachers.

She scrolled through her schedule for the week. Now in addition to the tennis matches she had on Tuesday and Thursday, the math test she had Wednesday and the first five chapters of Ender’s Game for English, she now had a history presentation to work on.

And double S.T.E.A.M. practices. Since they lost three of the four rounds in the match yesterday and didn’t make it to the finals, the team had decided to add another practice every week.

“What are you doing on the computer?” Mags asked.

“I’m taking an online course in C, it’s a really intense computer programming language.”

Mags’s phone chimed.

“ Sounds interesting. My mom’s here, I have to go to piano.” She slid her tablet into her bag and slung it over her shoulder.

“Ok, see ya.”

“I’ll walk with you downstairs.” Tammy really needed to get out of her room, she felt like the walls were closing in on her. “I need a snack break.”

She followed Mags down the stairs.

“Bye.” Tammy waved as Mags left through the front door. She watched her get into the back seat of the dark-blue hatchback and put her seatbelt on. Tammy could see Mags’s older sister, Genevieve, driving and her mother in the passenger seat, talking animatedly about something.

Tammy went into the kitchen and opened the pantry door. The one positive thing about her
brothers being gone was that there were always snacks on the shelves. Whenever they were home food seemed to disappear the second her dad brought it home from the grocery store.

She pulled out a blueberry fig bar and a small bag of trail mix. “Brain food” her mother called it, but Tammy just liked how it tasted. She went out the back door of the house and over to the swing set.

It had been in the back yard as long as Tammy could remember. Her brothers had gotten it for Christmas the year she was born. She sat down on her favorite swing, the one in the middle, and opened her first snack.

Tammy kicked off the ground and started swinging back and forth. She tried to forget about all of her work, but it just kept invading all her thoughts. Talking to her parents about the complete overwhelmed feeling she had hadn’t helped— they had just dismissed it.

“Everyone gets overwhelmed sometimes. You just have to be more organized,” her mom patted Tammy’s hand and went back to grading summer essays from her sixth-grade English class.

“Being the first black principal in the county didn’t come easy. You just have to make sure you don’t leave your work for the last minute. When I was your age…” Her father, the always punctual high school principal, started his usual speech, not looking up from his newspaper.

They hadn’t really heard what she was saying. She was beginning to think they never really did. They seemed to be more wrapped up in what they wanted her to be, not who she actually was.

She pumped her legs harder, the swing getting higher and higher.
Chapter 10: Sarah

Good luck! Sarah texted to Mags and Tammy.

Ty!

Thanks.

She walked over to Em and Abby. They were on the back porch at Em’s house getting ready to tie-dye t-shirts for their second S.T.E.A.M. match. Mags and Tammy were at a tennis match.

Neither of them had wanted Abby to come, but Ms. Neil had emailed all their parents strongly suggesting they spend some time together outside of school. Sarah had read the email over her mom’s shoulder a couple of nights ago.

“What colors should we use?” Em held up the box. “We have magenta, yellow, and blue.”

“We should probably stick to the school colors.”

“So, just the blue.” Sarah sat cross-legged on the wooden porch. She adjusted the plastic kiddie pool so it sat evenly between them.

“What color do you have for the letters?” Em opened the box and pulled out the instructions, rubber bands, and blue dye.

Abby looked through her box and pulled out a couple sheets of press-on letters. Sarah didn’t mind spending time with Abby, but it was always awkward because no one else on the team seemed to like her.

Sarah thought Abby seemed a little bit lonely, just like her. Abby hadn’t been hanging out with her other friends at school as much and had actually shown up at the diner a couple of more times. Sarah didn’t know if she came to talk to her or not. Once she just said hi and left and another time she sat across from Sarah in the booth and read a book for a while.
“Looks like silver is the only one I have enough of.”

“Silver should be ok,” Em said, trying not to sound excited. Sarah knew silver was Em’s favorite color. Em opened the instructions for the tie-dye across her legs. “This even has different patterns we can do the tie-dye in.”

“I’ve never done tie-dye before,” Sarah said, picking up the pile of shirts and the rubber bands. “So what do we do?”

“We need to fill this bucket with water and add the soda ash. Then we soak the shirts for about an hour,” Em read the paper. “And we just have to wait.”

“What does that do?” Sarah asked.

“No idea,” said Abby. “I’ll go fill up the bucket.”

Sarah pulled her phone out of her back pocket and swiped it unlocked. She went to her favorite search engine and typed: the science behind tie-dye. Em was trying to pull the top off the soda ash so it would be ready to add when Abby got back.

593,000 results in .43 seconds. She scrolled down quickly and picked an article that looked like it came from a reputable source. If this was actually for class, then she would research it, but since it was just curiosity, any one would do.

“The science behind tie-dye,” she read as Abby came back out on the porch. “So how does a boring white t-shirt turn into a colorful work of art? Science, of course! When you insert a typical piece of clothing made of natural fibers like cotton or linen to a dye, if it is fiber reactive, the dye will attach to cellulose fibers using covalent bonds. The dye molecule becomes a permanent part of the t-shirt’s cellulose molecules. The molecules hold a ‘chromophore,’ that absorbs spectrums of light, and allow only certain spectrums to reflect. The strongest type of reaction, yet most basic is Covalent bonds, which share electrons. They become even stronger
when pH levels of clothing are raised. Soaking in soda ash raises the pH level and ups the protons from the hydrochloric acid in the dye, so it works better at room temperature. The reaction can also be improved with heat. Some tie-dye can be microwaved to deepen the colors. After letting the dye set in the clothing for 24 hours, the bonding of the cellulose will be complete.”

“So, it’s chemistry,” Em said, pouring the bag into the bucket. She used a wooden spoon to stir it around. Abby threw the six t-shirts into the bucket and Em kept stirring until they were all the way submerged.

“Beautiful, beautiful, chemistry,” Abby said.

“Yep,” Sarah smiled and set the timer to sixty minutes on her phone.

“Now what?” Em asked.

Before either of the girls could say anything, the glass door to the patio slid open.


“Rwwwwahhhhhhh.” George followed on her heels pretending to be a t-rex, his favorite dinosaur.

“Mom!” Em yelled.

“What, honey?” Her mom stuck her head out the door, Julia clinging tightly to her hip.

“They’re going to ruin our stuff.” Em whined.

“I told them they could play outside. They’re driving me crazy in here and I’m expecting a call from your dad in a few minutes.”

“Dad’s calling?” Sarah could hear the excitement in Em’s voice. “But he’s not supposed to call until tomorrow night.”

“He sent me an email that he was going to call early.”
“Can I talk to him?”

“If he has time, honey, of course you can.” She closed the door and went back into the house.

Sarah watched her put Julia into the high chair and go over to the kitchen sink. Sometimes she wished she had siblings, even little annoying ones like Em had. They actually weren’t too bad, Sarah liked having the noise and chatter, unlike her house which was always too quiet. As if on cue George and Paige started screaming again and chasing each other around the yard.

“Why don’t we play Heads Up?” Abby said. “I just got the science addition pack.”

“I guess we could.”

“Sure,” Sarah set her phone next to her leg. “Sounds like fun.”

Maybe a game would break the tension between Abby and Em.

“The pack has animals, Earth science, computers, biology and a couple others.”

“How about Earth science,” Em said.

“Ok, I’ll go first,” Abby said, tapping her phone and holding it up to her forehead. A word appeared. Earthquake.

“Um the ground shakes,” Emily yelled.

“It rumbles and…”

“Earthquake,” Abby said.

“Yes!”

Abby moved the phone so it faced the ground, the put it back up to her head. A new word popped up. Mantle.

“This is the layer of the Earth under the crust,” Sarah was on her knees bouncing up and
“Core,” Abby said.

“No, above the core,” Em said.

“Ummm…”

“The opposite of woman is a m…”

“Mantle!” Abby said and put the phone down and back up before they could say she had gotten it right.

Tundra. Sarah read.

“Um.” Em looked over at Sarah. “I don’t know.”

“Uhh.” Sarah thought about it for a second. “It’s the Arctic region of the continents where nothing grows, it’s flat and permanently frozen.”

“You sound like a dictionary.” Em laughed.

“It still doesn’t help me,” Abby said. “I’ll just go to the next one.”

She flipped the phone up then down to her forehead again.

“It was the tundra,” Sarah said.

“Oh,” Abby said. “I never would have gotten that.”

The phone beeped.

“We only have thirty seconds left,” said Em.

Mount Everest.

“It’s a really big mountain.”

“The tallest one in the world.”

“Mount Everest!” Abby said. She flipped the phone.

Magma.
“Oh, this is what lava is called before it breaks through the surface of the earth,” Sarah said.

“Magma,” Abby said in a silly voice. She flipped the phone right before it beeped. The round was over.

“We got five points,” Em said holding up her hand for a high five. Sarah slapped it back.

“Here.” Abby handed the phone to Em, “your turn.”

“Ok, let’s do animals.” She tapped the screen and then held the phone up to her forehead. Giraffe.

“A tall yellow animal.”

“Oh, with brown spots.”

“And a blue tongue.”

“Giraffe!” Em said.

Antelope.

“Um, it’s in Africa.”

“Lion,” Em said.

“No.” Sarah answered, “it has horns and it runs really fast.”

“Gazelle?”

“No, um…” Abby said. Sarah was still trying to think of something else to say about an antelope.

“It’s like a gazelle,” Sarah stumbled.

“Let’s just go to the next one,” Em faced the phone up and then back onto her forehead.

“It was antelope,” Abby said.

“Oh.”
Boa Constrictor

“Emily.” The door opened before Sarah could think of anything to say about a huge nasty snake. “Your dad is on the computer.”

“Ok.” She stood up, forgetting about the game. “Here.” She handed the phone to Abby and ran inside.

“Well, I guess we’re done with that game,” Abby said.

“Yes, and only thirty-five minutes to go until the shirts are ready,” Sarah said. She hesitated for a minute but then decided to just talk. “I haven’t talked to Em about what you asked me to.”

“Ok.”

“I think you should just tell her.” Sarah wasn’t sure if it was the right thing, but the tension between everyone on the S.T.E.A.M. team was too much for her to handle.

“I know you’re trying to help, but no one else on the team wants me to be there, let alone be my friend.”

“But if you just talked to them how you talk to me.”

“They won’t listen.” Abby picked up the wooden spoon and stirred the t-shirts. “They think I’m just evil or something.

Before Sarah could answer she heard a shout a then a door slam from inside the house.

She looked over at Abby.

“That didn’t sound good.”

Chapter 11: Emily
Em ran up the stairs to her room and slammed the door. Maybe she could find a way to use all of her stuff to build a barricade so she never had to come out.

She had let it happen again. She had let her father get her hopes up and then crush them. She knew it wasn’t his fault, but she couldn’t help but hate him right now. And the army.

“Rawww,” she could still hear her brother and sister running around outside. She flung herself on her bed. Why were they so happy? She pulled Cuddles, a stupid stuffed animal puppy her dad had brought back from some exotic place years ago, into her arms and started crying again.

She didn’t know how much time had passed when she heard a light knock on the door.

“Em?” Sarah said from the other side.

Em didn’t answer.

“The shirts are almost ready; do you want to help us dye them?”

She heard the door click open, they obviously weren’t waiting for her to answer. She rolled over to face her wall and felt Abby and Sarah sit down on the bed with her.

“I’m really sorry about your dad,” Abby said. Em rolled her eyes. The last person she wanted to see her crying was Abigail Andrews. “Your mom told us he’s not going to make it back for your birthday.”

“Thanks,” she said sarcastically, wiping a tear from her cheek.

“Look,” Abby said, “I know you hate me, and I have no idea what you are going through, but I want to apologize for what Tiffany did to you last year.”

Em rolled over. That wasn’t what she was expecting. She momentarily forgot about her dad. She sat up and looked at Abby. She really did look sorry.
“It was awful what she did.”

“How would you know?” Em said, she wanted Abby to feel as bad as she did right now.

“Because, she did it to me.”

“Is that why you haven’t been hanging out with her or Courtney?”

“Yeah,” Abby said. “I thought they were my friends.”

Em thought Abby might start crying now. Em knew all too well how vicious rumors could be. Last year Tiffany had started a rumor that Em’s family couldn’t afford new clothes and that’s why Em always looked like an old homeless man at school. For weeks, other kids would taunt her in the hallways. What made it more embarrassing was that the school counselor pulled her out of class to ask if she had a stable home life. The next day Em pretended to be sick just so she didn’t have to face anyone.

“What happened?” Sarah asked.

“She told all the boys on the soccer team that I wear granny panties because my parents don’t want me to go to the beach with her over Spring Break. I went with her this summer and I hated it, she was just always bossing me around and making fun of me. So I told her my parents won’t let me go and she got mad.”

“That’s awful,” Em said.

“And the sad thing is that when I said I couldn’t go she asked Courtney and of course Court just jumped at the chance. Now neither of them will talk to me. Is it awful that I don’t miss talking to them?”

“No,” Em said.

“You must miss your dad,” Abby said.

“I miss him every day.”
“Yeah. I know what you mean,” Sarah said. Em sighed, she hadn’t meant to offend Sarah. She knew it must be hard to not have a father, but she also knew how hard it was to be constantly worried about your father. She didn’t know when or if he was coming home. Even if he was stationed in a safe place, he was always so far away and out of contact.

“Sorry Sarah, I didn’t mean to—”

“I know.” Sarah interrupted. Em noticed she looked sad now too.

“Why can’t our parents just be around when we need them?” Em whispered.

“Sometimes I wish my dad was in the army,” Abby said.

“No, you don’t,” Em sat up in-between Abby and Sarah.

“You don’t know what it’s like being an only child,” Abby said. “Your parents never leave you alone.”

“Not true,” Sarah said. “My mom is never around.”

“Well, my dad is,” Abby said. “All the time.”

Em laid down on her bed and pulled Sarah and Abby down beside her. They stared up at the ceiling for a few minutes, not speaking.

“We really should get down to those t-shirts,” Sarah said. Em could tell she was uncomfortable talking about her dad.

“It won’t hurt them to soak a little longer,” Em said.

Sarah stood up. She walked over to Em’s desk and started picking up the little doodads one by one.

“What’s all this stuff?” Abby asked.

“Oh, just junk,” Em said.

“What is this?” Abby had picked up her notebook.
Em pulled it from her hand.

“Oh, just some ideas I was sketching out before Dad gets back. He usually helps me finish anything I need to use the power tools for when he gets home, but it doesn’t really matter now.”

She tossed the notebook on the bed. Abby picked it back up and started scanning the pages.

“But Em,” Abby said, “this is amazing. I didn’t know you could draw like this.”

“It’s really not a big deal, just some simple sketches.”

“No, seriously, these are really good.” Abby was flipping pages. Em had never shown anyone her sketches before. Sarah and Tammy knew about her inventions, they had even helped her build some, but the sketches had been just for her. “You should take an art class.”

“I’ve never thought about it.” Em had always thought of her building and inventions as science or engineering or even architecture, but never art.

Abby pulled out her phone and started typing. After a few seconds she held out the phone for Em to see.

“Some of the most famous artists are known for their sketches. Da Vinci had hundreds of sketches of everything from horses to helicopters. See.” Em had been scrolling through the list of sketches and Abby clicked on one. “He drew plans for a flying machine in the late fifteenth century, more than four hundred years before the Wright brothers did their flight.”

“Well, I haven’t invented anything close to an airplane.”

“I’m sure da Vinci didn’t start with flying machines and cathedrals,” Sarah said.

“My mom majored in Art History in college and she never told me about any of this,” Em said, barely taking her eyes off Abby’s phone.

“Have you even shown her any of your sketches?”

“Once or twice, but she’s always so busy with George and Paige and Julie that I don’t think
she really cares.” Em handed the phone back to Abby.

“I think they are amazing. Maybe you could submit some for the Community Art Show. It’s in December, so you have a lot of time to work on it.”

“Maybe.” Em conceded, grabbing her sketchbook from Abby. “Let’s get downstairs and finish the tie-dye.”

Em stood up and put the sketchbook down on her desk. If her parents didn’t care about what she was doing, why should a judge find her drawings interesting? She followed Sarah and Abby down the stairs and to the back deck.

“Now what do we do?” Sarah asked.

Em picked up the instructions she had dropped on one of the chairs.

“Ok,” she said. “We need to wring out the shirts, twist them to create the design we want and use the rubber bands to hold them together. Then we can use the blue dye to dye them.”

“Sounds easy enough.” Abby pulled the first shirt out of the kiddie pool and wrung it out. Em and Sarah followed suit. They each had two shirts to work with. Once she had wrung them out, Em pulled the instructions toward her so she could see the different ways they could twist the shirts for the designs.

“Should we do them all the same, or should they all have different designs?” Sarah asked, looking over Em’s shoulder at the paper.

“They should all be unique, just like us.” Abby paused and put on a singsong voice, “Always remember that you are absolutely unique, just like everybody else.”

“Who said that?”

“Margaret Mead, my grandmother used to quote her all the time.”

“Who was she?” Sarah asked.
“I don’t know. My grandma said she was in all the magazines in the 60’s.”

Sarah pulled out her phone. “Hey Siri, who was Margaret Mead?”

The mechanical voice came out of the speaker, “Margaret Mead was a cultural anthropologist in the 1960’s and 70’s. She was featured in an all-woman set of trading cards called the Supersisters, along with seventy-one other prominent females of the time,” Sarah pushed stop on her phone.

“Wait a second,” Em said. “There are female trading cards?”

“That’s what it said.”

“Maybe we’ll all be on trading cards one day!” Abby said.

“That would be awesome,” Em said. She could see her picture, blond hair, blue eyes staring back at her from a trading card. Other girls all around the world learning about her and her engineering prowess.

“Okay, back to the shirts.” Sarah pulled the first one up close.

“I’ll do these two,” Em pointed out two of the designs on the page. One had a spiral on both the left and right side of the shirt and the other had horizontal stripes across the whole thing.

“I’m going to create my own design,” Abby said.

“Of course.” Em smiled.

“I’ll follow a pattern too,” Sarah said. “If I tried to do it on my own, it would turn out awful.”

“You both just need some confidence,” Abby said. “Be wild, be crazy, be bold!”

“Did Margaret Meade say that?” Em asked.

“That is an Abigail Marie Andrews original.”

They all laughed.

Em folded over the second shirt like a paper fan. She started at one end and rolled it into a
tight spiral. Then she wrapped three rubber bands around it to keep it in place.

“Both of mine are done.”

“Done,” Em said.

“Almost,” Abby said, snapping the last rubber band into place. “There.”

Em stood up and with Abby’s help dumped the contents of the kiddie pool over the side of the deck. They set it back down on the wooden slats and put the t-shirts inside.

“Now we just pour the dye on it,” Sarah said holding the instructions. “Then let them sit overnight and wash them out tomorrow.”

“Sounds like a plan,” Abby and Em said at the same time. All three of them broke down with laughter.

Chapter 12: Tammy

“You have twenty minutes until the end of the period,” Mr. James, the school’s computer teacher, said from the front of the room. Tammy was in Independent study class. They could work on homework and projects for other classes. Most kids just used it to play games on their phones, but Tammy always liked to work on the school computers. It was the perfect place to practice her coding, especially since her time after school was getting busier and busier.

Tammy was missing her brothers even more the past couple of weeks. She had so much work to do and just wanted to get outside with them, maybe play a pickup game of basketball. She also always came up with her best ideas when she was filled with endorphins after playing sports with her family.
Her parents always seemed to be hovering around, but Tammy couldn’t talk to them like she would with her brothers. Even Em and Sarah seemed to be distant.

Mags was the only person she could talk to right now and tennis was the one thing that was going well. They were doing amazing as a doubles team and with Mag’s motivation her singles game was getting better as well.

Tammy tried to focus on the computer screen. She had chosen a seat at the back of the room so no one could see what she was doing. Lines of code ran across the screen and her fingers sped across the keyboard. It was a flashback to this summer. She had avoided thinking about that day since it had happened.

Her parents had signed her up for a free tech and robotics camp. Neither of her friends was there. Em was on a family vacation. Sarah was at Space Camp, it was the third summer she had won a scholarship to go.

Some local college students were teaching the class with the help of Mr. James. Tammy was excited to learn more about robotics.

“We are going to break you up into four groups of four, each team with have an advisor to help them. Over the next two weeks we will help you to build and program your own robot,” Mr. James announced. “Each robot will be about the size of a toaster and need to perform two simple tasks.”

“Can we fight them?” Tammy recognized Brayden’s shout from the front of the room.

“Yeah!” His best friend Jaxon yelled beside him.

“No,” Mr. James gave them a look that said not to push it. Tammy knew Mr. James was a no-nonsense teacher and was glad he had never given her that look—she always loved his classes. “Tasks like going up a ramp or lifting a flag.”
“Oh.” the boys both sounded disappointed.

“Today we are going to talk about the basics of programming and break into our groups for the rest of camp.”

Tammy leaned back in her chair and looked out the window. The sun was shining bright and she wished she was at the pool right now. She could have taught this part of the class in her sleep. She just wanted to get to the part of actually building the robot.

She was also looking forward to going to the salon with her mom. Her mom was finally going to let her get her hair straightened. She had always had it braided, but she wanted to try something different. A new school year, a new Tammy.

“Ok, we’re going to have a quick bathroom break and when we get back, we’ll divide into groups.”

Tammy pulled her phone out of her bag and went into the hallway. There were only three other girls in the camp with her. Tammy didn’t know two of them. The other was Abby Andrews, a snobby girl who looked like she would rather be anywhere else than where she was. Tammy rolled her eyes and headed to the bathroom.

Stuck at tech camp with no one to talk to. She texted to Em and Sarah.

Stuck at Granrents with annoying cousins

Lunch time at space camp!

It looked like Sarah was the only one having fun right now. Tammy opened the stall to the bathroom and set her phone on top of the toilet paper dispenser. When she turned around she heard a splash and froze. Reacting on instinct she turned and pulled the phone out of the toilet as fast as she could.

“Ew, ew, ew,” she squealed and ran out to the sink. She pulled out some paper towels and
tried to wipe the phone off as best she could after stripping off the new blue and white cover she had just gotten. Her phone was tainted. She washed her hands about five times. She had touched toilet water— disgusting!

She knew she shouldn’t take her phone into the bathroom with her. She had always been afraid she would drop it in the toilet or the sink. So gross! She was going to have to disinfect it when she got home, or maybe even beg her mom for a new phone...at least a new cover, since hers was now in the trash.

She went back to the classroom and sat in her chair, trying to figure out if anything was wrong with the phone since it had gotten soaked. Everything seemed to be in working order.

At the end of camp, she went to the front office where her mom was picking her up. Her parents knew almost all the teachers and staff in the schools, since her dad was the high school principal and her mom was a teacher.

“Hey, Tammy,” Mrs. Durham, the school receptionist said when Tammy opened the door.

“Your mom is just back talking with Catherine.”

Tammy knew that Catherine meant Vice Principal Stower. Her mom and Mrs. Stower had been best friends for years. Tammy walked toward the door but stopped before walking in. They were talking in hushed voices and Tammy wanted to know what they were talking about.

“Mrs. Galloway?” Her mom asked.

“I swear,” Mrs. Stower said.

“I don’t believe it.”

The only Mrs. Galloway Tammy knew was the librarian at her school. She wondered if that was who they were talking about. She held her breath so she could hear more. Someone brushed by Tammy, almost knocking her into the wall, but she ignored it.
“That’s what Linda told me.”

“Well I heard that she and Coach Kerr were going on a date.”

Beep. Beep.

Tammy’s phone made her jump.

“Tammy?”

“Yeah, Mom.” She pulled it out of her pocket and stepped into the room.

“Hey, Honey.” Her mom smiled. “How was camp?”

“Fine. What were you guys talking about?”

“Oh, just silly gossip,” her mom said, giving Mrs. Stower a knowing look. “Well, we’d better get going. Tammy and I have an appointment at the salon today.”

Tammy knew that Mrs. Galloway was married to Mr. Galloway. She had never met him, but she knew Coach Kerr. He was the assistant football coach at the high school and taught World History.

“I have a lot of work to do anyway,” Mrs. Stower said. “I’ll see you Friday night for dinner with the girls.”

“Sounds perfect.” Tammy’s mom smiled and they went out into the hot muggy summer air.

Once she was comfortably in the air-conditioned car, Tammy pulled out her phone and sent another text.

Guess what I found out?

Send.

??

(Questioning emoji)

Mrs. Galloway and Coach Kerr are having an affair!!!
She hesitated a second before clicking send.

Nw! Em texted back quickly. Tell me the details please…i’m sooooo bored!

I don’t believe it! She’s married! Sarah answered.

That’s kind of what an affair is.

I know. Tammy could see Sarah get defensive.

Anyone doing anything fun tonight? Em asked.

Getting my hair done.

We get to go and see the zero gravity pool!

Don’t tell ANYONE! Tammy texted back to them.

“We’re here,” Tammy’s mom said, pulling into a parking space at the salon.

Tammy quickly selected all the texts and accidentally copied them before deleting them. She liked to get rid of all her texts right after the conversations. It saved room on her phone and it’s not like she ever read them again. She locked her phone and slipped it into her pocket before walking in.

It took a while for the stylist to get all the braids out of Tammy’s hair and then she had to sit under one of those heat domes that looked like the top of a space helmet with relaxer in her hair.

Once she was comfortably under the dome she opened the school’s scheduling app. On the front page was a large number twenty—counting down the days until school started.

She pulled up the messaging part of the app so she could look at exactly what books she needed to read for her English class and what she had to write about them. Since she was in the advanced class they had to read four books over the summer. Two of their choice and two from the short list the teacher sent them. She had already read Does My Head Look Big in This? By Randa Abdel-Fattah, So You Want to Be A Wizard by Diane Duane, The Hound of the
Baskervilles by Sir Arthur Conan Doyle and was almost finished with A Wrinkle in Time by Madeleine L’Engle (for the fourth or fifth time).

The screen on her phone started flickering. It must be the water from the toilet. She tapped the phone on her knee to try and get some of the water out. A new message popped open on the app. She tried to tap the screen to close it, but somehow she pasted in the text conversation she had just had with her friends.

She pressed the text cursor and started to delete it all. She had only gotten through a few lines when another box popped up, prompting her to set a time and date to send the message. Now she started freaking out. This message couldn’t get sent. It would tell whomever it was going to that Mrs. Galloway was having an affair.

Tammy tried to close out the box, but it wasn’t working. She held the power button down on her phone, and hoped that the message would get deleted.

Crap, crap, crap. She felt her stomach drop. She waited as long as she could before powering the phone on again.

Please work, please work, please work. Right when the screen lit up she opened the app and looked for timed messages. There was one, sitting there waiting to be sent out at midnight. Her only hope was that it was only going to a couple of people. Most of the messages she had in her app were from one class, not the whole school.

No, no. She opened the message and looked. This message was replying to an end-of-year message sent out from the principal to the whole list serve, which included everyone in the school, teachers and students. And in the body of the message was almost the whole text conversation.

She tried to delete it, but for some reason it wouldn’t let her. She opened her texts again.
We have a problem. She texted.

What?

U know those texts we just sent to each other?

Yes

Yeah. Sarah answered.

I dropped the phone in the toilet and somehow it’s going to send our texts out to the whole school.

No!

Not good.

What are we going to do? Tammy was frantic.

Can you fix it somehow? Em asked.

Maybe I can get access through the school computers, but I’ve never tried to hack into the school

Why hasn’t it been sent? Sarah asked.

I don’t know why it hasn’t sent yet, but I need to delete it before it does.

You’re going to have to do it at camp tomorrow.

Ok. Tammy texted back. I’ll let you know how it goes.

The next day Tammy had hacked into the school computer and managed to delete the message before it was sent out. She told Em and Sarah about it and thought that would be all, until her parents had surprised her with it.

Now she had to make sure no one would be able to figure out she was the one hacking into the school computers, but to do that, she had to hack in again—without being detected.
She finally found the code she was looking for. It was the code for the app she had created last year, with the small modifications the school had put on it for their use.

She pulled up the user history and scrolled back through the list. With a quick glance she saw what she needed to. Everything was gone, exactly what she had intended. She didn’t know of any way they could trace anything back to her. She shut down the computer and leaned back in her chair, letting out a sigh of relief.

The bell rang to signal the end of class. Tammy filed out with everyone else, slinging her backpack over her shoulder. Sometimes when she was in the crowded hallway of school, being jostled from one class to another, she felt like an electron being shoved down a computer wire. She pictured herself speeding from one classroom to another like commands from a large keyboard.

“Hey,” Sarah slid into step with her.

“Hey,” Tammy said. They both had English next.

“Did you read the short story for today?”

“No. I totally forgot,” Tammy said. “I meant to read it in my free period, but I ended up…” She glanced around to make sure no one was listening. It probably would have been easier for someone to overhear her at a rock concert. It was the first day of Spirit Week and everyone was in rare form. “I took care of the computer problem we were having.”

“Oh.” An air of recognition passed across her face, “is it all ok?”

“Yeah, but I won’t be if I don’t pass the quiz today.”

Sarah reached into her worn blue backpack. Tammy recognized it as the one Sarah’s father had gotten her for her birthday in third grade, it had her name embroidered across the back in big block letters. Tammy could see where they all had written their initials in permanent marker.
across the small pocket on the front.

“Here, I wrote out some notes and questions about the story. Just read this and you should be ok.” She handed the folded notebook paper over to Tammy.

“Thanks. You’re a lifesaver,” Tammy said.

“No, you are. I don’t want to think of what would have happened…” Sarah didn’t finish the thought. Tammy knew the rest anyway. What would have happened if the message had been sent or if Tammy had left a trace of her hacking, or— Tammy unfolded the papers not wanting to think about it.

“Will you tell Em?” Tammy asked.

“I guess I can.” Sarah didn’t seem too sure. Tammy walked into the English room and took her seat. Sarah sat in hers and turned around to see Tammy. “If she’ll talk to me.”

“What’s up with you two?”

“I don’t know—”

But Tammy didn’t hear what she was about to say because right then, the bell rang and everyone got quiet. They knew Mr. Beard like to start the class immediately, no exceptions.

Chapter 13: Sarah

“Order up.”

Ding.

“Hey Miss.”

Ching.
“I’ll be right there.”

Clink.

Sarah sunk back into the booth, listening to the familiar sounds of the diner.

She needed to study for regionals. She needed to read for English class. She needed to find Simon’s phone number so she could fix what she had done.

It felt like a weight in the bottom of her stomach. She knew what it felt like to be picked on. To be made fun of.

And she knew that was exactly how Simon felt after the last time she had seen him. She had never wanted anyone to feel like that.

“Hey.” Tammy slid into the booth across from her. “What’s up?”

“Not much.” Sarah lied.

“Yeah,” Tammy said. They were both quiet for a minute.

“Oh, did you figure out a way I can get in touch with Simon?”

“No, I’ll do that now.” Tammy took her laptop out of her bag and set it on the table.

“What can I get for you?” Sarah’s mom came up to the table. “It’s on the house.” She winked.

“Thanks, Mrs. S,” Tammy said. “I’ll have the pimento burger extra pickles, fries and a peanut butter milkshake.”

“Sounds good.”

“Can I get some onion rings, Mom?”

“Sure honey.” She scribbled some more on her notebook and walked toward the counter.

“Okay, this should only take a few minutes,” Tammy said, starting to type away on her laptop. Sarah knew that Tammy had given her school computer a couple of updates the school
probably wouldn’t approve of. “I doubt his school has very high security or anything.”

“Hey, guy—I mean girls.” Mags sat down in the booth next to Tammy, putting her messenger bag on her lap. It was funny to Sarah how easily Mags had become a part of their group. The three of them had become four. “Is Em coming?”

“No,” Sarah said. “She has to watch Paige and George.”

“Is she still upset about her dad not coming home?” Mags asked.

“Yeah. I think she is mostly upset about him missing her birthday,” Sarah said. “But she’s also—”

“Got it,” Tammy exclaimed, interrupting her.

“Just a sec.” Sarah shuffled her papers and books around until she found a pencil. “Ok, ready.”

“8 0 8 4 7 0 9 5 3,” Tammy read out.

“What’s that?” Mags asked.

“Simon’s phone number,” Sarah said. She was already dialing. She listened to it ring five times before the voice mail picked up. She clicked the phone off. She wasn’t ready to leave a message for him. “No answer.”

“Just leave him a message,” Tammy said.

“Yeah, and say what? Hey Simon, I’m sorry I made fun of you. If you could just call me back and forgive me that would be awesome. Thanks.”

“Who’s Simon?” Mags said.

“Oh, I forgot you didn’t know him,” Tammy said. “He was this geeky boy who was in elementary school with us.”

“Don’t call him geeky,” Sarah said, it just made her feel worse to talk about him. “Do you
think Em would still want a birthday party?” She tried to change the subject.

“Of course. I talked to my mom and she said we could have a sleepover at my house.”

Tammy said. “Her birthday is right before the next S.T.E.A.M. match so my mom could just drive us all there on Saturday.”

“It’s perfect,” Sarah said. “I’ll tell Em.”

“Order up.” Sarah’s mom set down the food on their table. “Pimento burger extra pickles, side of fries for Tammy. Side of onion rings and a peanut butter milkshake for Sarah. What would you like Mags?”

“How about a steak salad topped with fries and a piece of vinegar pie.”

“I’ll have to check to see if we have any left. A couple of truckers came in earlier and took three whole pies with them. What’s your second choice?”

“Um, huckleberry?”

“Okay. You three have fun studying.”

“Your mom is so cool,” Mags said to Sarah.

“Oh, thanks,” Sarah was still staring down at her phone.

“Earth to Sarah,” Tammy said. “What’s up with you?”

“Nothing,” Sarah picked up an onion ring and dipped it in the pale pink sauce. She hated that she couldn’t talk to them about Abby, she felt like it was bursting to get out of her.

“Sarah, really, what’s going on?” Tammy asked.

“I think you both should forgive Abby.”

There she had said it.

“Are you serious?” Tammy snorted.

“What?” Mags said.
“Look, I know she was mean to both of you, but she was going through a really hard time.”

“I don’t care—”

“Tammy, seriously. I want to start winning S.T.E.A.M. Team competitions and if we aren’t talking to each other that isn’t going to happen.”

“I don’t know if I can forgive her. She made Mags cry.”

“Em’s forgiven her.”

“But why? She was so mean. She and Tiffany and Courtney started all those nasty rumors and—”

“I know,” Sarah said and clicked open the Word file on her computer. “But last week Courtney and Tiffany did the exact same thing to her.”

“What?” Tammy looked floored.

“They started a mean rumor about Abby. Have you not noticed that she’s been eating lunch alone? Or that you haven’t seen her and Courtney or Tiffany walking down the halls together anymore?” The school loaner laptops were notoriously slow and her file was still opening.

“I hadn’t been paying attention,” Tammy said.

“Neither have I,” said Mags.

“Well, she seems just as miserable as you guys are and I think it would be nice if we could all get along.” Sarah kept her eyes down on her computer. She wished she could have a nice shiny new Mac like Mags, or was smart enough to build her own like Tammy.

Sarah didn’t have anything else to say. She hoped that Tammy and Mags would be able to forgive Abby.

The document finally opened and she read what she had so far.

Marjory Stoneman Douglas was born on April 7th in the year 1890 in Minneapolis,
Minnesota. She was an only child and her parents divorced when she was ten. Her mother moved her to New York where they lived with her grandparents.

Douglas won an award for her writing and drawing.

Not even close to three pages yet. She needed to get some more resources so she could get enough information. It was so easy to just type in Marjory Stoneman Douglas into the search engine, but that didn’t mean what loaded was a legitimate source.

Ms. Neil had been teaching them in science all about credible and non-credible sources. Using wiki-something was ok for an initial search, but anyone could edit the articles to make them say anything they wanted. More legitimate websites would be ones ending in .edu or .gov.

Ms. Neil showed them tricks on how to use the library and its website. She taught them the difference between primary and secondary sources. All of this came in handy when Sarah worked on all the facts and information she wanted to learn for S.T.E.A.M. and especially now when she was researching for her History paper.

Sarah looked up from her search. Tammy and Mags were both sitting across from her glancing at each other.

“Here’s your salad.” Sarah’s mom placed the plate on the last open space on their table; between a jumbled stack of papers and one of the girl’s laptops.

“Thanks,” Mags said.

“And here is your fork.” She balanced it on the side of the plate. “Can I get anything else for you guys?”

“No thanks Mrs. S.”

“Nope.”

Sarah waited until her mom walked away.
“Em is going to invite Abby to her birthday party,” Sarah said. “She’s already upset about her dad, try not to make her upset about this too.”

“Ok, fine,” Tammy said.

“Yeah,” Mags added, “we can call a truce for one night.”

It wasn’t perfect, but it would have to do. Sarah knew that they wouldn’t all become best friends overnight, but she really wanted the party to be a good one for Em. Even she was going to put aside being mad at Em for one night.

Chapter 14: Tammy

Tammy ran down the stairs to answer the door. She had just finished getting ready for Emily’s party and was expecting her friends at any time.

“Hey!” She opened the door, but it was the pizza, not her friends.

“Hi.”

“Mom,” she yelled. “Pizza’s here.”

She ran back up the stairs to finish fixing her hair. Positive thing about not having her brothers around—the bathroom didn’t smell like an extension of the high school football locker, sweaty socks and sweaty boys. Positive number two, she always had hot water when she was taking a shower. And positive number three, she knew when she went downstairs there would still be pizza left for her and her friends.

Down in the kitchen her mom and dad were blowing up balloons in Em’s favorite colors of silver and teal. Tammy pulled the birthday pies out of the fridge. She knew Em didn’t like cakes
so Sarah had helped Tammy get some of Em’s favorite pies from the diner. Happy Birthday! was written in a loopy script across the chocolate silk pie. The All-American Apple Pie and the Banana Split Pie had bright confetti sprinkles all over them—not something the diner pies usually had.

The doorbell rang again. Tammy ran to get it.

“Yay!” Em and Sarah were standing on the stoop.

“Happy Birthday!”

“Hey girls.” Tammy’s mom greeted them at the door too. “You guys can just throw your stuff in the basement. You know where it is.”

Tammy grabbed Em’s bag from her and they all ran to the basement. All three of them rolled out their sleeping bags like they use to when they were little. Tammy’s mom always called them the Three Amigos. Every Halloween since second grade they had dressed up in matching costumes. Tammy’s favorite was when they dressed up as rock, paper and scissors. She still had the photo on her wall.

The three of them were laughing and having fun, talking about silly things they had done when they were younger. Like Tammy’s crush on Drew Anderson in fourth grade and the unfortunate haircut Em gave herself in third grade.

“You did not look good with those bangs,” Tammy laughed.

“At least you didn’t let me cut your hair.”

“You tried, and I probably would have let you!” Sarah said.

“I only didn’t succeed because your mom came into your room and took the scissors away from us.”

“Yeah, Sarah,” Tammy said. “Your mom saved us both from awful haircuts.”
“And we had school pictures the next week,” Em laughed. “My mom wasn’t happy about that.”

They were still laughing when Mags and Abby came down the stairs. Mags holding a small duffle bag and a bright pink sleeping bag. Abby with a large purple bag slung across her shoulder and a dark green sleeping bag thumping down the stairs behind her.

“Hey!” Em shouted to them.

“Happy Birthday,” Mags said.

“Happy Birthday.”

“Thanks for coming,” Em smiled. “Pick a spot on the floor for your sleeping bags.”

“Girls,” Tammy’s mom yelled down the stairs. “Pizza time.”

They all ran up the stairs.

“This looks so amazing,” Em said, seeing all the decorations in the dining room for the first time. There were streamers and balloons everywhere. On the table was a stack of pizzas.

“Thanks Mrs. T.”

“You’re welcome sweetie,” Tammy’s mom put one arm around Em’s shoulders and gave her a hug. “I’ll let you guys have your party.”

“Thanks, Mom,” Tammy said as her mom left the dining room, “Let’s eat!”

Tammy picked a seat as far away from Abby as she could. She still didn’t like how mean Abby had been to Mags and to Em, but she was trying to be nice and she figured the further away from Abby she sat, the better.

The five of them devoured the pizza. Tammy got Sarah went into the kitchen to put all the candles on one of the pies and carried them into the dining room. Tammy’s mom turned the lights off and they all started singing.
“Happy Birthday!”

Em blew out all the candles.

“Hope you made a good wish,” Tammy’s mom said.

“I did,” Em smiled taking a piece of the chocolate pie.

Tammy took a piece of the Banana Split Pie and started eating. It was like a banana cream pie stuffed with pineapple and strawberries; topped with chocolate sauce, walnuts and cherries.

“I’m so full from the pizza,” Tammy said.

“But no one can turn down Dave’s pie,” Sarah said, shoveling some apple pie into her mouth.

“True,” Mags said. “I don’t know how I lived this long without these pies.”

Tammy couldn’t eat another bite. She felt the food sloshing around in her stomach as she walked down the stairs to the basement.

“How about we play a game.” Em suggested.

“I think we have Life or Monopoly in the closest,” Tammy said.

“Don’t you have Twister?” Sarah asked.

“Those are baby games.” Abby rolled her eyes.

Tammy wanted to tell her that if she didn’t like the games then she could go home.

“Yeah, we should play something cool,” Em said.

“How about Truth or Dare?” Abby said wiggling her eyebrows up and down.

Tammy thought about it for a minute. She had a lot of truths she wanted to ask Abby. Maybe she could get Em to back her up again, because Abby was not a nice person, and she was going to prove it.

“Um.” Mags looked wary.

“Sounds like fun,” Em said.
“I don’t want to do anything to get me in trouble,” Sarah whispered.

“Then don’t choose dare,” Abby said.

“I’ll start,” Em said. “Tammy, truth or dare.”

Tammy thought about it.

“Dare.”

“I dare you to take Mags’ socks and wear them on your hands for the next hour.”

“What?” Tammy laughed. “Seriously?”

“You better hope Mags washes her feet every day!”

“I do,” Mags squealed.

“Take them off.”

“Ok.”

Tammy held out her hand and grabbed the socks. She sniffed them.

“They don’t smell too bad.” She slipped them on her hands and made them talk like sock puppets.

“Ok, my turn,” Tammy said. “Abby, truth or dare.”

“Truth.” She said.

“Why are you so mean?”

“Tammy,” Em’s eyes went wide. “Why would you—”

“No, Em,” Abby said, “It’s ok.”

Tammy felt a little twinge of guilt for saying it, but she had to defend her friends, even if it did ruin Em’s birthday.

“I already apologized to Em for what Court and Tiff and I did last year.”

“And I don’t need another apology,” Em said flashing Tammy an evil glare.
“Fine, if Em is ok with that, I’ll be ok,” Tammy said. “But then why were you so mean to Mags?”

“I…”

“It’s ok,” Em and Sarah said. Tammy saw a tears forming at the corner of Abby’s eyes.

“I just see how tight friends the four of you are and I’m jealous,” Abby said. “I thought that Tiff and Court were my best friends and they turned on me. That day in history class, they had just told me they didn’t want to hang out with me anymore.”

Now Tammy just felt awful.

“I’m sorry,” Mags said. “I wish you would have told us what was going on.”

“I know, but I didn’t know you guys that well.”

“Girls,” Tammy said smiling now.

“Girls,” Abby said and smiled back. She wiped the tears off her freckled cheeks. “My turn. So, truth or dare, um Mags.”

“Do you have any crushes on the boys at school?”

Everyone laughed and Mags blushed.

“I don’t know,” she giggled. Tammy had never heard her giggle before. “Zach is pretty cute.”

“Oh, an older boy?” Em teased.

“He is pretty cute,” Abby said.

“Truth or dare, Sarah?” Mags asked.

“Um. Dare?”

Mags thought for a minute, before Em leaned over and whispered something in her ear.

“I dare you to call the Simon boy and leave him a message in a silly voice.”
Tammy saw Sarah blush as much as Mags had.

“No!”

“Oh, come on Sarah.” Abby teased. “It will be fun.”

“Fine, but I’m doing it from your phone,” Sarah held out her hand waiting for Abby hand it to her.

“Ok.” Abby unlocked the phone and handed it over. Sarah typed the numbers into the keypad and hit call. It was silent for a few seconds.

“It’s-a me Mario,” she almost screamed into the phone in an awful Italian accent. They all started laughing uncontrollably and Sarah dropped it. Tammy grabbed the phone and hit end.

“That was amazing.” They were all still laughing.

“So, my turn I guess.” Sarah was still beet red. “Em, truth or dare?”

“Dare.”

“I dare you to act like a rabbit until your next turn.”

“Ok.” Em got down on all fours and started hopping around the room and wiggling her nose. Tammy snorted because she was laughing so hard. “I do have to ask Abby a question though.”

“I’ll allow it,” Sarah said.

“Abby, truth or dare?”

“Truth.”

“What is the weirdest thing we don’t know about you?”

“Well, let’s think,” Abby said. “I don’t know, I own four sewing machines.”

“Four?”

“Yeah. I usually make my own clothes.”

“That’s why they are so unique?” Tammy asked.
“That’s amazing,” Mags said.

“Did you make that dress you wore to formal last year?”

“It wasn’t that hard,” Abby said.

“I thought it was amazing,” Sarah said. “Everyone was talking about it for weeks.”

“Yeah, thanks,” Abby smiled. “I could make you something sometime if you want.”

“Oh, I couldn’t afford anything like that,” Sarah said. “But it was really pretty.”

“It would look great on you,” Em said. “Especially if it was in the galaxy pattern like your t-shirt.”

“It would, wouldn’t it,” Sarah said smiling. Tammy knew that Sarah’s family didn’t have a lot of money and she was embarrassed about it sometimes.

“Anyway,” Tammy interrupted.

“Oh-yeah,” Abby said. “It’s my turn. Um, Tammy, truth or dare?”

“Truth.”

“Have you ever dropped your phone in the school toilet?”

“What do you know?” Tammy was floored, the only people who knew about what had happened were Sarah and Em. “Which one of you told her?”

“What are you guys talking about?” Mags asked.

“Yes, I have,” Tammy said. “Over the summer at Tech and Robotics Camp.”

“Ok. I think that’s enough truth or dare,” Em said loudly.

Tammy could feel the tension back in the room. Was Abby going to tell someone about what had happened? How did she even know?

“I have presents for all of you guys,” Em said.

“But it’s your birthday,” Mags said, “You’re the one who is supposed to get presents.”
“Tammy hand me my bag.” Tammy grabbed it off the floor and handed it to Em. She pulled the four presents out of the bag. She handed them out to all the girls. “Open them up.”

“Thanks Em!”

All the girls were holding up the tie-dye shirts that Em, Sarah and Abby had made. Tammy loved them and now they would all match for their tournament tomorrow.

“I love it,” Abby said. “I hadn’t seen it with our names on the back.”

“It looks so good,” Mags said.

All the girls put on the shirts.

“I’m sorry if I upset you,” Abby said to Tammy. “It’s just a rumor I heard around school and I was there that day over the summer. I was at Tech camp too.”

Tammy thought back. She didn’t remember Abby at camp, but she had been the only girl in her own group and hadn’t seen much of the other groups.

“I was in the bathroom when you dropped your phone,” Abby said. “And I was in the office when your mom was talking to the Vice Principal.”

“Seriously.”

“Yeah, I even went and talked to my mom about it that day.”

“Well, then everyone knows that Mrs. Galloway is having an affair with Coach Kerr,” Tammy shouted.

“Actually,” Abby held up a finger. “She isn’t.”

“What?” Em said. Tammy noticed that all the other girls were listening in now.

“My mom told me to stop spreading nasty rumors that weren’t any of my business. And then she said it was completely untrue.”

“But they were talking about it,” Tammy said. “I was standing outside the door and I heard
my mom say that Mrs. Galloway was going on a date with Coach Kerr.”

“You must have heard them wrong,” Em said.

“Maybe they were going on a double date. Her with her husband and Coach Kerr with someone else.” Sarah said.

“Ughh.” Tammy put her head into her hands. “This is even worse, I’m going to get expelled for stupid gossip that wasn’t even true.”

“You’re not going to get expelled,” Abby said.

“How do you know?”

“Well, my mom is a hair dresser and Mr. Gregson’s wife is one of her best clients,” Abby said. “I was in the salon doing my homework when she came in one day. She said something about how someone had hacked into the school database, but they don’t think it was you.”

“Who do they think it is?”

“I think they were going to blame Jaxon and his little annoying friend that were in Tech camp with us.”

“Brayden?”

“Yeah, so you’re off the hook.”

Tammy wasn’t so sure. She didn’t want anyone else to take the blame for something that she had done. She knew she needed to talk to her parents about the whole situation, but she just had to work up the nerve.

Chapter 15: Sarah
“The scientific method can be broken down into seven steps. Some of those steps may have to be repeated, depending…um…depending on…”

Sarah stuttered and looked down at her green index card. She tried to find her place, but her hands were shaking.

“Just take your time Sarah.” She looked up and got a reassuring smile from her favorite teacher, Ms. Neil.

“Ok.” She closed her eyes and pushed her hair behind her ear. She was always so nervous talking in front of a room of people, even if those people were the same ones she had gone to school with since Kindergarten.

She tried to imagine she was in a room with just her four best friends. Everyone else seemed to fade away around them. She could see Emily’s encouraging smile. Mag’s impeccably put-togetherness. Abby’s crazy, out-there attitude. And finally Tammy’s athleticism.

She smiled, reassured by even the idea of them, and opened her eyes. But something was wrong. Everyone in the classroom was pointing and laughing at her, even her friends.

Her onyx black eyes went wide. She could feel the tears starting to form in their corners. What was wrong? Did she have something on her face? Was she suddenly naked?

“The scientific method…” She tried to start her speech again, but the laughing just got louder. It was a sonic boom in her ears, like the space shuttle she had seen launch when her parents had taken her on a trip to Cape Canaveral when she was little.

She looked over to Ms. White for some reassurance, but all she saw was the same laughter. She caught a glimpse of herself in the glass door of the cabinet beside her.

What was she wearing? She looked a little closer. It looked like a dark brown bunny suit. Well, not really a bunny, more like a hare…with long ears and huge feet.
She felt her face flush bright red and turned, running out of the room.

“Sarah.” Someone called her name. But she wasn’t going to listen to them, they had been laughing at her. She kept running down the familiar science hallway.

“Sarah.” The voice was more insistent now, “wake up.”

She sat straight up, confused and disoriented.

“I don’t want to be a hare,” she said loudly.

A familiar face gave her a questioning look.

“A what?” Emily arched one eyebrow, a skill she had perfected years ago.

“A hare, a…a jackrabbit.”

“So you don’t want to be a bunny?”

“No they’re different. A hare has elongated ears and feet. A bunny has a smaller body and lives in a burrow underground, not a nest.”

“Whatever you say, Nerd.” Em threw her pillow and hit Sarah in the face, “breakfast is ready.”

Sara looked around. There were three empty sleeping bags lying around the room.

Now she remembered. She was at a sleepover, in Tammy’s basement. Yesterday had been Em’s birthday. Everyone was now getting along. She was still mad at Em, and she never had, nor ever would, dress up like a hare at school.

She let out a long sigh.

Emily held out her hand and Sarah grabbed it. Em pulled her up onto her feet and they clomped their way up the stairs and into the Travises’ kitchen. On the way she could smell the baking cinnamon rolls and the tart fresh oranges.

Tammy’s mom always made fresh cinnamon rolls when the girls stayed over. They
would get a whole tray just for themselves. There was usually another whole tray just for Tammy’s two older twin brothers, Timmy and Tommy, but not today, since they were off at college on a full ride scholarship for football. Tammy had told Sarah that she never felt like she could live up to her perfect older brothers. Sarah didn’t have any siblings to compare herself to, just four amazingly perfect best friends. That was enough pressure for her.

Sarah sat down at the kitchen table between Mags and Em.

“Morning everyone,” Tammy’s mom said, setting the hot and gooey cinnamon rolls in front of them. Sarah watched the steam rising up toward the ceiling.

“Morning, Mrs. Travis.”

“Morning, Mom.”

“Are you girls ready for the S.T.E.A.M. competition this afternoon?” Mrs. Travis asked, sitting down at the last open chair. Sarah couldn’t see her through the fresh daisies and freesias arranged artfully in the middle of the table.

“Ye…” Em tried to say through a mouth full of cinnamon roll. “Sowy.”

They all started laughing.

“Well you better get all your stuff packed up so we can get going soon. We have to leave by eleven.”

Sarah looked up at the clock. Mrs. Travis got up from the table and went into the kitchen.

“So, we have one hour and twenty-three minutes, or eighty-three minutes or 4980 seconds or…”

“We get the point Mags,” Abby said trying to run her fingers through her curly red hair and failing miserably, as usual.

“Sorry,” Mags said. “I need the practice.”
“You need practice at math like Em needs a new tool set.”

“Like Sarah needs another telescope,” said Em taking another bite of her breakfast.

“Like Abby needs a new sewing machine.”

“Like Tammy needs to hack into the school database again,” Abby whispered.

“Shhh,” Tammy said, leaning into the table. She darted her eyes over to her mom who was only a few paces away.

The girls giggled, but Sarah’s stomach dropped. She didn’t like breaking the rules, even if it was for a good cause. She knew it had been for the best cause, but she mostly didn’t want to think about it.

“We’re going to get ready,” Tammy said a little too loudly, trying to cover up their conversation. The girls stormed down the stairs devouring the last bits of cinnamon roll and licking the icing off their fingers. We sound like a parade of elephants, or a band of gorillas or a leap of leopards, Sarah thought. Thinking of the scientific terms for groups of animals made her forget about the school computers.

A bloom of jellyfish.

An audience of squid.

Ok, she wasn’t really sure what the last two would sound like, probably weird and squishy and floppy, definitely not like five girls bounding down the stairs.

Or bounding up the stairs which is what they all did about an hour later. Sarah could have been ready in about five minutes, because that’s how long it took her to put on clean clothes and brush her elbow-length straight black hair.

Her mom never wore makeup, so Sarah really didn’t see the point. Neither of them were girly girls. They would both rather be out in nature, camping or hiking, not that they did that
lately. Her mom always seemed to be working.

   Ever since Sarah’s dad died her mom had to take on extra shifts at the diner and had a lot less time for Sarah. There had been no more hiking, no more stargazing, no more flower picking. And Sarah missed it all, but especially her dad.

   The pit in her stomach from thinking about him was worse than the pit in her stomach from lying. It hadn’t been slowly eaten away over millions of years by the slow trickle of water, like the Grand Canyon. It was instantaneous, like an earthquake, an earthquake 100.0 on the Richter Scale, a scale that only went up to 10.0, and a 10.0 meant utter and complete devastation.

   “You ok?” Em put her hand on Sarah’s shoulder.

   Sarah just nodded.

   “You have that faraway look in your eyes,” Em said.

   “Just thinking about my dad,” Sarah grabbed the silver pendant at the end of her necklace and rubbed it. She never took it off. It belonged to her father and her grandfather before him. It reminded her of who she was. Who she was proud to be. She felt like he wouldn’t be happy with her and how she had treated Simon. He never liked to see people picked on.

   Sarah followed the other girls into the Travises’ minivan and climbed to the far back, wedged in the middle between Mags and Em. Mrs. Travis backed the van out of the driveway.

   “To the competition!” She clicked the van into gear and accelerated down the road.

   “Yay!”

   “Yeah.”

   “Woo-hoo!” The girls all cheered. Sarah’s stomach jolted.

Chapter 16: Emily
“At least it wasn’t as bad as our first competition,” Abby said.

All five girls were sitting around one of the tables in the science classroom waiting for Ms. Neil.

“Yeah,” Mags said. “But we still didn’t win.”

“True,” Abby said frowning.

“But we won two of the matches.” Em was trying to be positive. “And our matching shirts were awesome.”

“We did look great,” Abby said, smiling.

“Next stop regionals,” Mags said.

“Hey guys,” Ms. Neil said, carrying a large box into the room.

“Girls,” Tammy said and looked over at Abby.

“What?” Ms. Neil asked dropping the box onto the table with a thud.

“We’re girls,” Abby said.


“What’s in the box?” Sarah asked.

“Before we get to that, I just want to say how amazing you guys were at the last match.” Ms. Neil put her hand on the top of the box. “I can tell you all are jelling so much more as a team. I don’t know what you guys, I mean girls, have been doing, but just try to keep it up!”

Em looked around. Everyone was smiling. They really had come together at the last match. They might not have won, but everyone had seemed more confident in their own abilities, except maybe Sarah. Em still wasn’t sure what was wrong with Sarah but she was determined to find out.
“So, the box has two projects for us to do today.” Ms. Neil smiled. “I thought since all our meetings have been so serious we would have a little fun. We have to go outside to do both of these, but I’ll tell you what they are. First, you are going to be working together to build a solar cooker. And second, it’s time to make your team banner. It’s a S.T.E.A.M. tradition. All the schools vote on the best banner before the final competition and the team with the most votes gets a special award.”

“Awesome!”

“So cool.”

Em followed everyone outside. There wasn’t a cloud in the sky. It was the perfect afternoon to try and cook something in a solar cooker. Tammy and Mags carried the box between them.

“I’ll be over here if you need me.” Ms. Neil pointed to some benches.

“Where should we put this box?” Tammy asked.

“How about we put it in the grass and we can build the solar cooker on the sidewalk, it will be hotter there.”

“Ok,” Mags and Tammy dropped the box to the ground.

“Its not as hot as the tennis courts,” Mags said.

“We don’t want to roast alive!” Tammy joked.

Em opened up the box and started to pull things out and handing them to Abby.

“I think this bag and this roll of paper is for our banner,” Abby said, setting some things to the side.

“So what do we have to make a solar cooker?” Tammy looked over Sarah’s shoulder, trying to get a better view of what was in the box.

“Well, we have the box,” Em said.
“A couple rolls of aluminum foil,” Abby held them up.

“I think there is a sheet of glass wrapped in this bubble wrap.”

“Scissors, tape, a ruler and some black construction paper.”

“And it looks like we are going to be cooking hot dogs, veggie dogs…”

“Those are mine,” Mags grabbed them out of Em’s hands.

“Oh, marshmallows, chocolate and graham crackers!” Abby squealed.

“S’mores!” Tammy and Mags said at the same time.

“Let’s get building.”

“What should we do first?” Mags asked.

Em had never built a solar cooker before, but she knew that they needed to use the power of the sun by reflecting it off something shiny and then it would concentrate its power to cook the food.

Em made her way over to Sarah while the other girls were organizing all the supplies. Sarah sat down on the grass and Em sat down beside her. Sarah was holding all the food in her lap.

“What’s wrong?” Em asked her.

“Nothing.”

“Sarah, really?” Em sighed. “We’ve been best friends since we were three. I know that something is wrong.”

“If you don’t remember what you did then I don’t want to talk about it.”

“Fine.” Em got up and walked over to the other side of the box. She wasn’t going to chase Sarah around. She wanted to help make this solar cooker and help design the banner for her team.

“So first we need to cut a flap in this box,” Mags said.
“Ok, I’ll do that,” Tammy grabbed the scissors.

“Make sure it isn’t bigger than the piece of glass.”

Em jumped in to help. She lined the bottom of the box with black paper, while Abby wrapped the top with aluminum foil. Em knew that objects colored black would get hotter in the sun than lighter colored objects, but didn’t know why.

“Why do darker colored objects get hotter?” Abby asked before Em had a chance.

“Every color is made by the wavelengths of light is absorbs or reflects,” Sarah said, sounding like an encyclopedia entry as usual. “Colors that absorb more light will get hotter and black absorbs the most.”

“Awesome,” Mags said. “So the light will reflect off of the aluminum foil.”

“And pass through the piece of glass,” Tammy added.

“And the black paper will heat up, helping to heat up the food.”

“Exactly,” said Sarah.

“How’s it coming along?” Ms. Neil had put on a large brown sun hat and sunglasses. Em thought she looked like she was going to the beach.

“I think we have it,” Tammy said. Em was handing her pieces of the duct tape so she could secure the piece of glass to the top.

“It looks good,” Ms. Neil said. “I think if we make a little tray for the hotdogs and let it heat up for a few minutes it should be ready.”

“How about we get started on the banner,” Abby said.

Em rolled out the paper with Abby’s help.

“How should we decorate it?”

“Here,” Abby pulled a drawing pencil from behind her ear. “Give me some ideas and I’ll
sketch them out on the poster. Then we can all paint in what I’ve drawn.”

“Sounds perfect,” Mags said. “I’m so bad at drawing.”

“Me too,” Sarah said.

Em knew she wasn’t bad at drawing, but she knew Abby was amazing at all things artistic.

“So, we put our school name at the top,” Tammy said.

“And in huge letters S. T. E. A. M. Team across the whole middle,” Sarah made a sweeping motion with her arms.

“Then we should have a polka dot border around the whole outside.”

“Slow down,” Abby’s left hand was racing across the poster trying to keep up with all the ideas. Em was amazed at how well she was sketching out the huge bubble letters and was starting on the border of varying sizes of dots.

“Maybe you could draw some things that go with each of the categories. Like a computer for technology and a paint brush for art.”

“Ok,” Abby stood up to look at what they had so far. “I think the border should be painted all different colors and then each letter should be one color but in an hombre effect.”

“What’s that?” Em asked.

“The color will fade from dark to light. I can show you all how to mix your color paints with white to get the right effect.” Abby started handing out paints to everyone. “After that’s done, I’ll draw in the details with some markers.”

“And we should all sign our names across the bottom,” Tammy said.

“That would look awesome.” Abby smiled.

“Sarah, do you want to help me put the hotdogs on the solar cooker?” Em asked.

“Sure.” Sarah put down the tube of royal blue paint and walked over to the cooker.
“Just open it up and I’ll put the hot dogs on.”

“Make sure Mag’s veggie dog doesn’t touch ours,” Sarah said.

“Ok.” Em felt so awkward, she just wanted to talk to Sarah, but didn’t know what to say. She really couldn’t think of why Sarah would be so mad with her. “Would you please just tell me why you are mad?”

“Fine,” Sarah whispered. “I needed to talk to you and you said you were going to come to the diner and you didn’t.”

Em tried to remember when Sarah was talking about, but couldn’t. Before Em could say anything Sarah jumped up and went back over to paint the S in S.T.E.A.M. Still confused Em followed her over to paint the E.

Chapter 17: Tammy

The halls were teeming with students pushing their way through to the next period. Tammy clung tightly to her books. She was keeping her history project safe. She had been working on it for the past couple of weeks…a lot, and today was the day of her presentation.

“Ready?” Abby slipped in beside her, like a fish into the stream.

“I think so,” Tammy said. She was a little nervous, but she finally felt like she had done something right. She had been able to get a lot of work done at the diner with Sarah and Mags a couple nights before.

Before that nothing had been going her way. Her parents had been on her about her grades and she knew she had to do a good job on this project.
“You’ll do great.”

“Thanks.”

They wove their way to room 115, where the teacher was writing on the chalkboard. Tammy looked at the list of names. James T., Kelly, Micah, Tammy, Margaret. She sighed. She really wanted to go first and get it over with, but she was going fourth.

She sat down at her desk and pulled out her notes. Abby sat down next to her. A minute later Mags slipped beside her and rested her forehead down on her desk.

“I am so not ready for this presentation,” Her voice sounded muffled. Tammy looked up from her notes.

“What’s up?” Abby asked. She looked relaxed because she had done her presentation the day before. She had set the bar for everyone else’s presentation. Her poster was perfect and she of course went above and beyond the requirements. If Abby wasn’t one of Tammy’s friends now she would probably hate her. She always had everything together and the presentation had been no different.

Tammy thought it was funny that all five of them had chosen strong women who changed the world of S.T.E.A.M. in some way. Along with Abby, Em and Sarah had also done their presentation the day before. Sarah did hers on Marjory Stoneman Douglas, the woman who single-handedly saved the Florida Wetlands. Mags did her presentation on Miriam Mirzakhani, an Iranian self-taught mathematician who had solved many “unsolvable” problems. Abby did hers on Joan Beauchamp Proctor, a zoologist in London who used her artistic talents and love of reptiles to transform how animals in captivity lived.

Abby had even gotten in touch with the London Zoo and gotten an email reply with the answers to all her questions. Who was going to be able to top that?
Tammy looked down at her notes, trying to read through them one last time, trying to tune out the other conversations around her. She looked at her first notecard: Annie Easley was a computer programmer, mathematician and one of the first U.S. rocket scientists.

She saw Em raise her head off the desk in her peripheral vision.

“I just haven’t been able to concentrate.”

“Your dad?” Abby said.

“Yeah, I haven’t heard anything from him in a while and it’s almost my birthday.”

“Was he supposed to call you?”

“I don’t know. He never knows when he is going to be able to call us, but it’s been a while and the last thing I said to him was that I didn’t care what he did.”

Sarah and Mags walked into the classroom right when the bell rang.

“Good morning everyone,” Mrs. Forward said. “We have the last five presentations to do today so let’s get started.”

“It’ll be ok,” Abby whispered.

“Ok, first up is James T,” Mrs. Forward sat down at her desk. Tammy stopped listening. She needed to focus on her own presentation. She had practiced it with her mom the night before, but her mom hadn’t given her any pointers. It really didn’t even seem like she was listening.

Tammy’s brothers were playing in their first televised WVU game. And even though they were freshman and didn’t even play yet, her parents could barely take their eyes off the television. Tammy had really wanted to watch it too, but she knew she needed to get her work done. She was already worried about her parents finding out about her computer hacking, she didn’t need them to pay any more attention to her because her grades were falling.

“Pelé was the….“
Tammy looked up to watch James. She wished she was going next after him. His presentation made her look prepared. He was a cross between disorganized and uncaring. The next two weren’t as unorganized as James. Micah’s was even kind of interesting.

Before Tammy knew it, it was her turn. She walked slowly to the front of the classroom clutching her notecards tightly in both hands. Her tennis shoes made a slap-click sound as she walked on the faded linoleum floor.

“Ok Tammy, you have ten minutes.”

“I need to use the projector.”

“Ok. You can go ahead and set it up,” Ms. Forward said.

Tammy smiled and relaxed a little. She, and all her other classmates, knew Ms. Forward was fiercely protective of every piece of technology in her room. Last year a student broke her projector on the first day of class. Rarely did she let a student touch the projector or computer let alone set it up by themselves.

Tammy opened up the laptop and logged on using her school username and password. She pulled up her PowerPoint presentation and while she waited for it to load she powered on the projector. Once it was ready she stepped back over to the wooden podium.

Annie Easley: A woman in STEM by Tammy Travis

She took a deep breath.

“Annie Easley was a computer programmer, mathematician and one of the first U.S. rocket scientists. She was born on April 23, 1933 in Birmingham, Alabama.”

Tammy shuffled to the next card and pressed a button on the laptop. The screen zoomed in to a picture of the east part of the United States. There was a star on Birmingham and a star on Cleveland, OH.
She pressed the button again and the slide zoomed in on Alabama. It was labeled with pins where Easley had lived and worked.

“She was valedictorian of her graduating class at Holy Family High School and earned a spot at Xavier University in New Orleans as a pharmacy major. After two years of college she returned home and helped other African Americans register to vote, which included a really hard literacy test and a large tax.”

Tammy pressed the button again. An older looking document slid onto the page. It had “sample” written across the top followed by the letter B. This was one of the three primary sources she had used in her paper. Ms. Neil had helped her find them.

“There were three parts to the literacy tests. Section A had the potential voter read out loud a passage of that state’s Constitution. The registrar would mark each work he or she thought you had mispronounced. Then the registrar would read a section of the Constitution and the voter would have to copy it down word for word. Potential white voters usually received the easy passages and would be allowed to look at the section while copying it. Blacks would get the harder and more obscure sections of the Constitution and would have to write down whatever was mumbled to them. This picture shows section B and section C of the test, which they would have to correctly answer.”

Tammy pushed the button again. The screen zoomed out and then back in, now focused on Ohio.

“Easley moved to Cleveland with her husband a year or so later. She wanted to finish school, but the pharmacy program had recently closed down and there was no alternative nearby.”

Click. A newspaper article slid across the screen. This source had taken her a really long time to find, but she finally had in the Library of Congress’s Chronicling America project.
Tammy looked up from her notecards. Everyone seemed to be paying attention. She wasn’t sure if that was good or bad. Mags gave her a reassuring smile. She smiled back and looked back down at her cards.

The rest of her presentation was a blur. She finished with a quick thank you and hurried to her seat, glad that Ms. Forward wasn’t making them have a question and answer section.

“That was awesome,” Mags whispered.

“Yeah, it was good,” Abby said.

“Thanks.” Tammy smiled. “Good luck Mags.”

Mags jumped out of her seat and went to the front of the room. Her presentation on Miriam Mirzakhanin went just as smoothly as Tammy’s. Everyone gave her a round of applause at the end and she smiled walking back to her seat.

Brinng.

The buzzer rang for the end of class. Tammy took her books and shoved them into her bag, zipped it shut and headed for the door.

“Have a good weekend everyone,” Ms. Forward said to the retreating backs. “Tammy can I have a word?”

“Sure.”

Tammy hung back while everyone else emptied from the room.

“Tammy, I just wanted to say you did an excellent job on your presentation. You’re going to have to show me how to get my Power Point presentations as good as yours.”

“Um, thanks,” Tammy said, “I worked really hard.”

“And it showed,” Ms. Forward said smiling. “Next time, just try to look at your audience a bit more. You can tell your parents that it was an A project.”
“I’ll do that.” she left the room happier than she had been for a while. It would be some good news to tell her parents along with the bad. Maybe they would take it easier on her.

Chapter 18: Sarah

“Where’s Em?” Mags asked and gently set her lunch bag down on the table across from Sarah.

“I don’t know,” Sarah pushed around her pile of greenish peas with her fork. They were sitting at the same circular table they always did, but where there was usually one open seat, there were now two and she didn’t mind the change. Em had been so happy after her birthday party, but now she was moodier than ever since her dad still hadn’t come back home. And if Em didn’t know why Sarah was upset at her, she wasn’t going to say anything.

“She said something about talking to Ms. Neil.” Abby pulled a Ziploc bag of carrot sticks out of her lunch box and threw them into the middle of the table. “Who wants them?”

Sarah grabbed them up. She hated peas, especially ones from the cafeteria that were more grey than green and she was hungry, so Abby’s second-hand carrots would have to do.

“You can have my peas” Sarah offered them up.

“No, thanks.” Abby snorted, “I’m not even sure they can legally call them peas.”

“Hey girls?,” Em sat down.

“I’m going to talk to my parents tonight,” Tammy said.

“About what?” Mags asked.

“About breaking into the school computers,” Tammy said. “I can’t let anyone else take the blame for it.”

“What are they going to do to you?”
“I don’t know,” Tammy said.

“Do you think they will ground you or something?”

“I’ve never really gotten into big trouble and this seems like something I will get into big trouble over, especially since I lied to them about it before.”

“Will they make you quit tennis?” Mags asked.

“What about the S.T.E.A.M. Team?”

“I don’t know,” Tammy said. “But it will be better than them finding out from someone else, I know that.”

Sarah didn’t know what Tammy should do, but she knew what it felt like to hold something in. She had felt like she was going to bust and then she finally did when she told Emily how she felt about being forgotten. Not that it helped because Em still didn’t know what she had been talking about, but at least she felt a little better about it.

Her and Em’s friendship was not the only thing on her mind, it was also Simon. She felt like she had texted him a million times and tried to call his phone a million times, but he never answered her. She figured he was just too mad at her to answer, and she couldn’t blame him.

“Earth to Sarah.”

“What?”

“Are you excited about regionals this weekend?”

“Yeah.” Sarah answered. “It should be fun.”

“We only have one more practice,” Mags said.

“I’m nervous,” Abby said. “It seems like it is a big deal.”

“I hope everyone likes our banner.”

“That’s what I went to go and check on,” Em said. “Ms. Neil had the whole thing laminated
and it looks amazing. You guys should go check it out, she has it up in her room.”

“Let’s go up there,” Mags said.

“Ok,” Abby grabbed some food off her tray.

“I’ll go too,” Tammy said, sounding dejected.

Em and Sarah stayed to eat their lunch.

“Why don’t you go?” Em asked.

“I’ll just see it in class later.”

“I figured it out,” Em said sheepishly. Sarah looked up to see Emily staring at her.

“Figured what out?” Sarah asked, taking another bite of her sandwich.

“Why you were so mad at me.”

“Oh,” Sarah didn’t say anything else. She was waiting to see what Em was going to say.

“It was when you got your braces off and were really upset about Simon,” Em said. “And I told you I was going to come over to the diner and we would talk.”

“And you forgot.”

“Yeah, my dad called and said he was going to be home for my birthday and I was just so excited that…I forgot.”

“Ok.”

“I’m so sorry Sarah.”

Sarah knew Em was sorry. She also knew how exciting it was to Em when her dad came home from deployment. Sarah would be excited too.

“It’s ok,” Sarah finally said. “I forgive you.”

“Thanks,” Em gave her a hug.

“Here,” Sarah took out a cookie from her lunch bag and split it in half. She gave the bigger
half to Em.

“Thanks.”

“You’re welcome.” Sarah smiled.

“So what are you doing about that Simon thing?” Em asked.

“Well, Tammy found his phone number for me, so I’ve been calling it every day trying to apologize.”

“Has he answered you?”

“No,” Sarah said. “I think he’s just so mad. I would be too if someone had made fun of my like that.”

“Maybe I’ll think of something else we can do,” Em said. “If nothing else you will see him at regionals and can talk to him then.”

“True,” Sarah said. “I didn’t think about that.”

“Now we have to figure out a way to save Tammy.”

“Do you think her parents would ban her from coming to regionals?”

“I hope not,” Em said.

“We couldn’t win without her,” Sarah said and knew it was true. She wasn’t confident about her own abilities and combine that with her fear of public speaking, she was always a mess during the competitions.

“You’re going to be fine,” Em said.

“But you saw me during my history presentation. I was a bumbling mess,” Sarah knew she was right.

“It wasn’t that bad,” Em smiled.

“I forgot the name of the person I was doing my presentation on,” Sarah said, “Twice!”
“True, but you kept going.” Em said.

Sarah sighed. She had no idea how she was going to get through these nerves. They were already starting to take over and they were still days away from the regional competition. She didn’t want to know how she was going to feel when it was time to compete.

Chapter 19: Emily

“Quiet down girls.” Ms. Neil stood up in front of them looking very upset. Em glanced around the room. They were all there except Tammy.

“Where’s Tammy?” Em asked.

“I’ve just had a very long discussion with her parents,” Ms. Neil said. “She will not be able to make it to practice today since she is in detention after school for the next two weeks.”

“What?” Mag’s eyes went wide.

“Seriously.”

Em couldn’t believe it. How were they going to do it without Tammy?

“What happened?” Sarah asked.

“Just listen,” Ms. Neil said a little louder. “She will not be going to regionals with us, but I convinced her parents to still let her compete. She will be coming on Saturday morning and leaving right after the competition is over.”

Em let out a long breath. She thought they were going to have to compete without Tammy for a minute.

“Oh,” Mags said.

“In light of something she did, her parents didn’t think it would be fair for her to be there for the dance the night before and the other evening activities,” Ms. Neil said. “But they also felt that
it would be unfair to the rest of you girls and all the time and effort you have put into this to not let her compete.”

“Thank goodness,” Abby said.

Em glanced over at Mags. She wondered if this would affect the tennis team for her as well. Mags did not look happy at all.

“So, let’s get started. I loved how well you guys did putting together that solar cooker. You are working so much better as a team and I know it will really help our chances this weekend. And those hotdogs and S’mores were really good.”

“They were,” Abby said. “I love chocolate.”

“What are we going to do today?” Sarah asked.

“I thought we would just make it a question and answer session. I’ll hand the notecards out and you can ask each other questions,” Ms. Neil said. “I have to run down to the office and copy these permission slips for you all.”

Em got the notecards and handed them out to the rest of the team. She waited until Ms. Neil was out of the room before saying anything.

“That was close,” Abby said.

“Yeah,” Em answered.

“I wonder what Tammy told her parents,” Sarah said.

“I really thought Ms. Neil was going to tell us that Tammy wouldn’t be able to compete this weekend.”

“I know,” Em said. “My heart jumped up into my throat.”

“But now we have to focus,” Abby said. “Even if Tammy can’t be there the night before, she will be there for the tournament and won’t be very happy if we aren’t ready and focused.”
“True,” Mags said.

“Let’s get to work.”

Em was smiling at the end of practice. Even without Tammy the practice had gone amazing. Riding her bike back home she felt pumped and ready for the tournament. She pulled in and dropped her bike in the driveway.

“Mom!” She yelled when she got into the house. She had noticed that her mom’s van wasn’t in the garage which was weird, and now she was in the house and it was quiet, which was even weirder.

“Mom, Paige, George,” She searched through the house, leaving the kitchen for last. There was a note tacked to the fridge with a letter “M” magnet.

Em,

Had to take George to physical therapy. Be back after dinner time, I’ll bring you some fast food home.

Love, Mom

Em jumped. The computer had started ringing. She ran over, hoping it was Dad. The only other people who ever called were her grandparents, because she had taught them how to use it over the summer.

She pushed the enter button and her dad’s face popped up on screen.

“Hey sweetie!” He said. “I wasn’t expecting you to be home.”

“I just got back from S.T.E.A.M. Team practice. We have regionals this weekend.”

“That’s awesome hon. I’m sorry I can’t be there and I hope you guys win the whole thing.”

“I know, Daddy,” Em said. She hadn’t talked to him since before her birthday. She had been so mad after the last call “I’m sorry I was so angry the last time you called.”
“No, I’m sorry I got your hopes up and then couldn’t make it to your party.”

“So, when are you coming home?”

“I don’t know for sure sweetie, but I will let you know first thing,” Her dad said. “Is your mom there?”

“No.” Em sat down in the chair at the computer, “she had to take George to P.T., but I can let her know you called.”

“Ok, honey.” Em heard an announcement out of the speakers and her dad turned away. A couple of camouflaged people ran by and lights started flashing on and off.

“Where are you, Dad?” Em tried not to sound worried.

“Oh, I’m just about to go to another outpost, nothing exciting.”

“What was that announcement?”

“I think you’re breaking up,” he said. “I’ll try to call back later if I get a chance.”

“Ok.”

“Bye Em.”

“Bye Daddy,” She waved and he blinked out.

Em sat in the dark dining room for a few minutes. She knew if her dad had a choice that he would choose to be home with her and the rest of the family. She also knew that he really didn’t have a choice. His job took him around the world and away from them a lot, but she loved him no matter what.

Em left the room and went up to her room to start packing for the tournament. Her phone rang when she got up the stairs.

“Hey Sarah.”

“Hey Em.”
“What are you doing?”

“I was just about to start packing for the weekend.”

“Do you want to come over and hang out at the diner with me tonight?”

“Sure, just let me pack and I’ll be right over.” Em smiled, as much as she liked not having her siblings climbing all over her, she was glad to have friends to go and see, the house seemed way too quiet when she was there alone.

Chapter 20: Sarah

Sarah kept twisting her long black hair around her finger, then letting it fall.

“Keep still.” Abby chastised, trying to apply eyeliner.

“I’m trying,” Sarah huffed. It wasn’t her idea to put this makeup on anyway. She didn’t even really want to go to this dance. She’d managed to avoid every other one, always coming up with one excuse or another. But being stuck in a hotel room with her best friends didn’t leave much room for excuses.

“Almost done,” Abby said.

“Oh, it’s going to look so good,” Em said.

Sarah tried not to fidget. With her eyes closed her other senses were being barraged with stimuli. She could smell the hairspray and perfume floating through the air. When Abby brought the makeup closer to Sarah’s face, she could smell the paint and crayons Abby was constantly using for her art.

The zip of dresses and clipping of shoes were almost drowned out by the laughter and anticipation that hung in the air. Being a scientist it was hard for Sarah to think of anticipation as
a physical thing, but she could feel it anyway. It was like nervous butterflies in her stomach.

“Ok, open your eyes.”

Sarah blinked them open. She could see her reflection in the mirror. Her eyes looked darker, larger. She looked to the side and saw Abby smiling.

“I watched a video on contouring. What do you think?”

“It’s amazing.” Em went to her other side. “You could be in high school.”

“I like it.” Sarah smiled. It really did make her look older. Her cheekbones and square jawline were more prominent. She looked exactly like her mother except for the deep black of her hair and square chin—those were both from her father.

“I wish Tammy was here,” Mags said from the edge of the bed. “It’s not the same without her.”

“Well, your turn to get some makeup on,” Abby said.

Sarah stood up to make room for Mags. She still had to pick out which outfit she was going to wear. She had brought a long light blue dress with dark blue stripes. She slipped it over her head.

“Can you help me button up the back?” She walked over to Em who had just put on a grey skirt with black polka dots and a black shirt with a sparkling gold batman symbol on it.

“Nope,” Em said. Sarah was confused. She knew that she and Em hadn’t been talking to each other as much as they used to but ever since Em’s party, Sarah thought they had been getting better.

“Oh,” Sarah said, trying to twist her arms around so she could reach the buttons.

“Because,” she heard Em say behind her, “that’s not what you are wearing.”

Sarah turned around to see Em holding up the most gorgeous dress she had ever seen. It had
a spiral galaxy pattern in deep pink and purple and blue and black. It was exactly like the dress she had admired at Em’s birthday party.

“We all know how much you wanted that dress, so Abby decided to make it for you,” Em said.

Sarah couldn’t stop smiling. Her friends really were the best.

“I sewed it for you from a simple pattern I found,” Abby said from across the room.

Sarah slipped her light blue dress down over her hips and Em helped her pull the new one over her head. Em tugged up the zipper on the back of the dress.

“Does it fit?” Mags asked, her eyes still closed because she was getting her makeup on.

“Yeah, it’s…” Sarah moved over to get a good look in the mirror. The pink in the dress was the exact shade Abby had used on her lips. The dress had a high neck and was sleeveless. The bottom was flowy—longer in the back and shorter in the front, hitting her just at the knees. “It’s amazing.”

“You can look now Mags.”

“Oh Sarah, it looks gorgeous.” Mags gave her a hug. She was in a sea-foam green ballerina skirt with silver glitter dusted all over it and a matching top lined with white lace. “But you are missing one thing.”

Mags went over to her bag and started searching through.

“What?”

“Now these are not for you to keep, just for you to borrow, because they are my favorite.”

She held out two black shoes with a mess of tangled straps. “I’ll help you put them on.”

“Thanks.” Sarah wouldn’t have known where to start.

Mags deftly slipped Sarah’s first foot into the sandal and wrapped the straps around her leg.
until they were a couple inches above her ankle. Then she did the same to the other one. Sarah was glad to see that they were flats, she had only ever tried on one pair of high heels. Her mother had one pair stuffed in the back of her closet for special occasions. She would bring them out when she went on dates with Sarah’s dad, but ever since he died, Sarah hadn’t seen her wear them.

Sarah had tried them on once when she was little and clopped around the house pretending to be a princess. Her dad would swing her around and around.

“Girls.” Mags’s mom walked through the door between the adjoining rooms. “The dance already started. Are you almost ready?”

“Yes.”

“Yep.”

“Almost.” Abby was just touching up her own makeup. Her outfit was more subdued than what she usually wore when she dressed up, but still over the top of anything Sarah would ever wear. The top of the dress had a large flower print with bright yellows and greens and reds. A silver belt separated it from the asymmetrical deep red bottom.

“And…done,” Abby said, turning away from the mirror, letting her dress swirl around with her.

“You girls be careful and be back up to the rooms at ten,” Mrs. Mu said. “Ms. Neil should already be down there, they had a faculty advisor meeting and then were going to chaperone.”

“Ok.”

“We’ll be back later.”

“Bye, Mom,” Mags said over her shoulder.

Sarah was the last out the door and let it close gently behind her. They hopped on the
elevator and dropped down to the first floor.

“This is going to be fun,” Abby said, leading them all to the ballroom.

The double doors at the end of the hallway opened and Sarah could see the blinking colorful lights. She could hear the thumping of the music. The doors closed and it all disappeared.

They walked closer. Sarah was excited and nervous at the same time. She rubbed the Cherokee pendant hanging around her neck, but more out of nervous habit, she liked to have something to do with her hands.

They walked into the room and it took a minute for Sarah’s eyes to adjust to the dark. It was like looking at stars at night. You couldn’t just walk out of your bright house and see all the stars, it took a few minutes until you could take in the beauty of it all.

Once her eyes adjusted she started to make out everything around her. The shiny wooden dance floor was straight ahead. A handful of people were dancing and laughing while the music pounded around them.

The dance floor was surrounded by tables which were in turn surrounded by chairs. Most of which were empty. People were lined up at the snack table getting fruit punch or chips. It didn’t seem like the mixer was working too well, people were sticking in their own small groups.

She followed closely behind Em. Careful not to lose her because even though it wasn’t crowded, she didn’t want to find herself alone. Abby was in the lead, weaving though the tables toward the dance floor. The music wasn’t familiar to Sarah who didn’t listen to music a lot anymore. Her dad had a huge collection of music on his computer, but ever since he passed, she couldn’t bring herself to listen to it, it felt wrong somehow—without his strong slightly off-pitch voice belting out the words.

On the dance floor Abby and Mags immediately started dancing. Em swayed back and forth
to the beat. Sarah just stood there feeling awkward, like everyone was looking at her.

“Come on,” Em yelled so she could be heard over the noise and pulled on Sarah’s hand.

“I don’t know how to dance.”

“Neither do I. Just move.” Em wiggled and shook as Sarah tried not to laugh, wishing she didn’t care about what everyone else thought and could just dance.

“I’m going to the bathroom,” Sarah yelled back.

“Ok, just get back here quick.” Em turned, blended into the crowd, and kept dancing.

Sarah didn’t really have to go to the bathroom, but she felt awkward in her new dress and didn’t really want to dance in front of everyone else. She walked off the dance floor and over toward the snacks. Maybe she would feel better if she was holding something in her hands. Sarah waited alone in line to get something to drink.

She could just see Abby’s red hair moving on the dance floor and Mag’s sparkly skirt swirling around her. Sarah looked down at her own dress and could see the silver sparkles shining in the flashing lights.

“Having fun?”

She turned, surprised to see Simon standing behind her in line. She hadn’t noticed him.

“Uh, yeah.” She stepped up as the line moved in front of her. “Just getting something to drink.”

Sarah turned away to face the table. She was finally face-to-face with Simon, but she couldn’t get the words to come out of her mouth. She had been trying, very unsuccessfully, to get in touch with him for almost two months and now that he was here, she just wanted to run away and hide under a rock. Like one of those little roly-poly bugs that not only hid under the rocks, but curled up into a little ball, pretending no one would see them.
“You don’t have braces.” Simon said stepping beside her. She could see he was wearing khaki pants with a simple polo shirt. It was the most relaxed she had ever seen him. “And…and I like your dress.”

“Thanks.” She picked up a cup from the table. “You look nice too.”

He picked up a cup and grabbed the ladle for the punch. He scooped the juice into her cup and then into his own cup. She looked up to see he was smiling at her. She tentatively smiled back. Why was he being nice to her? She had been absolutely awful to him. Was this some kind of trick or something?

“Would you like to dance?” He stammered, looking down at his feet.

“I’m sorry,” she said.

“About what?”

“I don’t know how,” She said at the same time. He looked confused.

“You first.” He pointed to her. His hair was different too, not so stiff. It suited him.

“I’m really sorry about what I said about you being a dork.” She felt a blush creep up over her face and hoped he couldn’t see it in the dark room.

“What?”

“I tried to call you and text.”

“How did you get my number?”

“It’s a long story,” Em said, the music getting louder.

“My mom took my phone away.”

“Why?”

“For getting a B on a test.”

“Oh.” She should have realized. She thought he was just mad at her, but he didn’t even know
she was trying to apologize.

“It’s ok,” he said. “I mean, it did hurt my feelings, but I know I’m a dork so…” He shrugged it off. “So?” He held out his hand, “would you like to dance?”

“Sure.” Sarah set down her cup on the table and took his hand.

The butterflies she had felt in her stomach earlier were dancing, but she didn’t think it was nerves about the competition anymore.

Chapter 21: Tammy

Tammy jumped out of the car before her dad could even put it in park. She was late. The traffic getting into town was awful, but at least she was here. After a full confession she had finally convinced her parents to let her go to the S.T.E.A.M. competition. They weren’t happy about her lying to them, but they were glad that she had confessed what she had done.

“We’ll meet you in there.” She heard her mom yell out the passenger side door.

The competition was being held in a couple of the ballrooms of the hotel. Tammy had been to this hotel before—when her brothers had been all-state for football and they had all gone to the award ceremony. She sprinted through the lobby and toward her team.

She heard clapping and cheering behind the first door she got to and looked in. She didn’t recognize anyone, so she went to the next one. There were two teams she didn’t recognize up on the stage, but she saw Mags’s mom and Abby’s mom in the audience. This must be where they were going to be.

“Tammy!” She turned around to see Mags standing behind her. “We didn’t think you were going to make it!”

“I know,” Tammy said trying to catch her breath. “We were stuck in traffic for like an hour.”
“There’s no time for that now.” Mags pulled her toward another room, “we’re about to go on. Everyone will be so happy you made it.”

They went through another door and were in a much smaller room that had been partitioned off so each team could have their own space to get ready.

“Guys guess who I found?” Mags said, dragging Tammy behind her. Tammy smiled as she saw her friends sitting on hard metal folding chairs, all getting ready for their turn. She thought they looked amazing in their matching t-shirts.

“Tammy!” Abby and Em jumped up smiling. Sarah wasn’t far behind.

“S.T.E.A.M. Team and Wolverines you have five minutes,” a loud voice rang out across the room.

“I’ll explain everything after,” she said. “But now we have to get ready. We need to focus.”

“Everyone ready to go?” Abby asked.

Everyone nodded. Tammy noticed how nervous they all looked.

“Hey,” Tammy said. “I know we all have been working really hard for this and it hasn’t been easy, but I know we can do it. I’m sorry I couldn’t make it to the last practice, but I’m here now, so let’s do it!”

“Yeah!” Mags and Em said.

“Come on. Let’s get on that stage and kick some Wolverine butt.”

“Woo-hoo!” they all yelled. Tammy saw Ms. Neil smiling across the circle from her. It made Tammy smile too.

She followed Abby up to the stage and stood behind the second chair, she couldn’t stop smiling. She loved being on stage and she loved competition, this was like her US Open, her Wimbledon. The moderator walked out onto the stage. She tapped the microphone and feedback
resonated around the room making Tammy wince.

“Welcome to the first round of the Western North Carolina Regional S.T.E.A.M. Competition,” Her voice sang out through the room. “We have the Polk County Middle School S.T.E.A.M. Team versus the South Asheville Fighting Wolverines.”

The audience clapped.

“You can all sit down.” The moderator pointed to the two teams and they all sat. “I am not going to read the rules and regulations as you all received them and should have read them through thoroughly before the competition.”

Tammy’s knee wouldn’t stop bouncing. It was a mix of excitement and nerves. She wanted to prove to her parents that her team needed her and they had done the right thing by letting her come.

“Let’s get started. Question one.” The room went silent. The nerves of her teammates were palpable. Tammy had her hand on the buzzer waiting to answer, “it is the largest two-digit prime number and also…”

Buzz.

“S.T.E.A.M. Team”

“97,” Mags said confidently.

“Correct. Now for the bonus questions. Bonus one. What is the smallest positive whole number you can multiply by seven to get a prime number?”

“One,” Mags answered easily without even consulting with the rest of the team. Tammy was still trying to remember what a prime number was. She thought back to math class. She was pretty sure a prime number was a number that could only be divided by one and itself.

“Correct. Bonus two. Which of these numbers is prime? 26, 57, 100 or 13.”
“13,” Tammy whispered to Mags.

“13,” Mags said loudly. Tammy must have been right. Twenty-six could be divided by two, fifty-seven could be divided by three and 100 could be divided by lots of numbers, but thirteen could only be divided by itself.

“Correct, and the last bonus question is, what are the prime factors of eighteen?”

Before Tammy could even think of an answer Mags had buzzed in.

“Um, two, three and three,” She said.

“Correct.”

Tammy smiled and gave Mags a high five. One question down and thirty-one to go. There was polite clapping from the audience.

“Question two. Gravitational forces between the moon and Earth cause this oceanic phenomenon. The high and low…” Tammy pressed the button.

Buzz.

“Wolverines.”

“Tides,” a small girl from the other team said. Tammy looked over to the other team.

“That is correct.”

The Wolverines got all the bonus questions right, so now the teams were tied.

“Question three. These types of rock are formed by the deposit of materials on the Earth in or out of the water, and then the cementation of that material. It is also the rock group in which shale and sandstone is classified.”

Tammy had no clue. She had never really been interested in geology. She looked down the table to Sarah, whose eyes were wide. Come on she thought, you know this. But Sarah was frozen.
“Five more seconds,” the moderator said.

Buzz.

“Yes, Wolverines.”

“Is it sedimentary?” They asked it like a question, they weren’t sure of the answer either.

“That is correct.”

Tammy looked back down to Sarah. She looked like she was about to cry. She didn’t seem to be very good under pressure. Tammy knew Sarah knew the answers to these questions, she was amazingly smart. She was like her own little encyclopedia.

Mags had called Tammy after the dance last night and sent her pictures of all of them in their dresses and Tammy had hoped that Sarah would have gained some confidence from it all, but it didn’t look like it.

After thirteen more questions it was half time and the score was still tied. Tammy had gotten three questions right and most of the bonus questions. She was very excited her parents were watching her do so well.

At the end of the round, Tammy sighed, they had just scraped by. It had been too close to her liking. She knew that Sarah really had to step up her game, or they wouldn’t win when they went into the finals. They might not even make it to the finals—they had to see how all the other teams did and they had to win two of the next three matches today.

Chapter 22: Sarah

Sarah caught the elevator going down. She needed to clear her head after her abysmal showing during the first day of the tournament. She found herself walking down the hallway to the exercise room and pool. She pulled out her key card and went into the exercise room. She
ignored the “you must be fifteen or accompanied by an adult” sign.

It smelled a little like the locker room at school mixed with a very strong flowery air freshener. Sarah had never been that into athletics. She enjoyed being outdoors hiking and stuff, but was never into team sports. She had tried to play softball once when she was seven, but found that she liked picking flowers and staring up at the clouds finding the different shapes and pictures, instead of catching the ball.

They put her in the outfield and left her there for the entire season. The ball had only come her way once and she just watched it roll by. Her parents didn’t insist that she do any sports after that, they just made her finish out that season.

She stepped up onto a treadmill and pushed the button. It started rolling under her feet. She was trying not to think about the competition, but it was hard. They had made it to the finals, but it wasn’t because of her, it was in spite of her.

She looked at the time and saw that she needed to get back upstairs for lunch. Pushing the red emergency stop button she slowed to a stop and jumped off the machine.

“Hey,” a voice said from behind her. When she turned around, she was face to face with Simon. Her stomach fell to the floor and her face flushed red.

“Simon. Hi,” she said. “What are you doing here?”

“I was just taking a walk around the hotel before the finals today.”

“Oh, I was just trying to have some time alone,” she wasn’t sure what else there was to say.

“Are you nervous about getting up in front of everyone later?”

“A little.” She didn’t want him to know how nervous she actually was. “I better get going up to the room, I still have to get ready—and I shouldn’t be seen talking to the enemy.”
“Ok,” Simon said. “I had a really good time at the dance last night.”

“Me too,” she said, thinking back how they had danced together for two slow songs and how everyone had asked her questions when they got back up to the rooms for the night.

Sarah put her hand on the door and pulled. Nothing happened. She tugged harder. She pulled with both hands. Nothing happened.

“I can’t get it open.” She stepped to the side. Simon tried.

“Maybe it’s stuck.” He pulled harder. She looked at the space beside the door. On the outside you had to use the room key to unlock it, but there wasn’t a way to unlock it from the inside. It shouldn’t be able to lock them in.

“Are we trapped in here?” Sarah was starting to panic. She didn’t like the feeling.

“I can’t get stuck.” A look of panic flashed across Simon’s face too. He pulled harder.

“This can’t be happening. You can just call someone with your phone to come and open it up.”

“I don’t have my phone, I left it up in the room,” Sarah said. “You call.”

“I don’t have a phone. My mom took it away…”

“Because you got a B. So, we are trapped.” Sarah threw up her arms. “This is just the icing on the cake.”

“Maybe you need to swipe your card to get out.”

“There’s nowhere to swipe a card on this side of the door.” Sarah pointed out.

“What should we do?” Simon started pacing around the door. Sarah put her hands around her eyes to look out the windows separating the exercise room and the hallway. No one was passing by.

“I guess we have to wait until someone comes to work out. Or someone comes looking for us.”
“They don’t know where I went,” Simon said.

“Me either.” Sarah walked over and sat down on one of the exercise bikes. “I won’t be too sad to miss out on the competition.”

“Are you nervous?”

“Yeah,” Sarah said. “I’m not answering any of my questions right…” She couldn’t finish the thought. It made her sick just thinking about it.

“I’m glad the rest of my team is so strong. My mom wanted me to be our captain but I’m happy to just sit back,” Simon came and sat down next to her. “I hate being in front of so many people.”

“So, do I,” Sarah said. “I used to be able to look at my dad when I was getting nervous about things, especially in public, but now I can’t.”

“Why not?”

“He was driving home from visiting my grandparents. He was on curvy roads and he was following a semi-truck. They went around a curve and the truck had to slam on its breaks and at the same moment they think the sun blinded him by bouncing off the back of the truck. They said it was quick,” Sarah had never told anyone about what had happened to her dad, not even Emily. She had never really talked about it with anyone and didn’t know why she had blurted it out to him. They were both silent for a few minutes.

“I’m sorry.” She looked up at Simon, he really did seem sad and sorry. “I miss my dad too.”

She wasn’t expecting that.

“What do you mean?”

“He’s dead. It happened when we were in third grade.”
“I…I didn’t know.”

“It was an accident at work. I don’t like to talk about it.”

Sarah opened and closed her mouth a couple of times, not sure what to say. She didn’t remember anything like that being talked about in her class she had with Simon. She tried to think back if anything about him had been different before that Christmas break.

“You don’t have to say anything,” Simon said. “I never had anyone to talk about it with, but it was hard. Especially since everything still seemed to go on, like nothing had happened. Christmas still happened, then New Year’s Eve and a few days later school started again. Everyone came back from break like nothing had happened, when my world had been turned upside down.”

“I’m sorry.” She bit her bottom lip. She seemed to have vague recollections of Simon running around during recess, playing and having fun. Simon being surrounded by friends and smiling. Then about the time he was talking about all she remembered was him being mean to her and angry all the time. Now it all made sense. “If I had known.”

“You wouldn’t have done anything different. You hadn’t lost your dad yet, so you couldn’t have known what I was going through.”

Sarah started to protest but Simon held up his hand. “After it happened, I just kind of shut down and my mom started smothering me, and hasn’t stopped. She thinks she can protect me from everything, but most of the time I just feel like I need some sort of protection from her.”

“My mom kind of did the opposite. She threw herself into her job and I was left to fend for myself. Not that she doesn’t love me or take care of me, I just…” She was trying to find the right words. “I just, had to grow up a lot faster than my friends.”

“Yeah.” Simon commiserated, “none of my friends understood so they all just kind of
drifted away. You’re lucky. I see the way you and Em, Abby, Mags and Tammy act around each other. You have four close friends you can talk to about all this stuff.”

“It doesn’t seem like it most of the time. Lately they just all seem to be interested in things I don’t care about or they’ve been too wrapped up in what they want to do to think of me,” Sarah said. “I mean I have to get up in front of all these people and…I really don’t think I can do it.”

“You know the thing I miss most about my dad?”

Sarah shook her head.

“I know I don’t look it now, but I was pretty good at soccer when I was younger. Mom won’t let me play anymore because she thinks it’s too dangerous, but Dad and I loved to play together,” Sarah saw a twinkle in Simon’s eyes that she had never seen there before, he looked almost happy. “One time I was playing goalie and I let in the game winning goal. I was crushed and embarrassed. I felt like I let my team down and I told my dad that I never wanted to play again. I even tried to throw away all my soccer gear but he caught me. He told me that it was better to try and fail then never to try. Then he told me that I had to finish out the season or I would let my team down more than just giving up that one goal,” then he added, almost as an afterthought, “that’s why I asked you to dance, I felt like I might as well try, even if I failed.”

They sat there in silence for a few minutes.

“Do you every wish you could just talk to him one more time?” She asked in a low voice.

“Every day.”

Sarah nodded, “me too.”

“Look,” Simon said. “If you ever want to, I’d be willing to, you know, talk.”

“That would be nice.” Sarah answered. “If we ever get out of here.”
They both smiled a little.

“We’re going to be so late,” Simon said. “I wonder if anyone is looking for us yet.”

“I’m sure they are.”

Suddenly the door burst open and someone, looking to work out, walked in carrying a water bottle and a small towel.

“Don’t let the door close!” They both yelled and jumped up.

Sarah and Simon rushed over and caught the door before it closed.

“Watch it!” the woman said. “You kids shouldn’t be in here. You have to be fifteen to use the weight room. What are your names?”

Simon and Sarah looked at each other and then ran out.

“I wonder if she’s going to turn us in?” Simon asked.

“How could she?” Sarah asked. “She doesn’t know our names and she’s probably going to be stuck in there just like we were.”

They both started laughing. Simon pushed the up button on the elevator.

“Thanks,” Sarah said as they were waiting.

“For what?”

“For talking with me, it really helped.”

“No problem.” He gave her a small smile and quickly looked away. “You know, you could look at me when you get nervous, maybe that would help a little.”

“Thanks,” Sarah said. “But don’t think this means I’m going to go easy on you in the competition.”

“Oh course not,” Simon said seriously.

Before Sarah could say anything the elevator dinged and the door opened.
“SARAH!” Em yelled and jumped off. “Where have you been? Everyone has been worried about you!”

Before she could say anything Em pulled her onto the elevator and jammed the door close button. Simon had followed them onto the elevator, but Em hadn’t seemed to notice.

“We were looking everywhere. I tried calling your cell phone, but no one answered and then I found it was turned off on the table. I snuck out to try and find you. Ms. Neil bought it when we said you were in the bathroom, but I think she was starting to get suspicious,” Em had barely taken a breath the whole ride up. “Come on.”

She pulled Sarah off the elevator and onto the ninth floor.

Sarah turned around just in time to see the door closing on Simon. She gave him a small wave and mouthed “thanks” before the doors closed and he disappeared.

“Look girls,” Ms. Neil said “You have done so well and I know you are going to do great in the finals today. I just got the final lineup and you are going against the Ghosts.”

“Really?” Sarah asked. It actually made her less nervous to know that Simon would be out there on the stage with her. They were all sitting at a round wood table in the hotel restaurant waiting for their lunch.

“Yes,” Ms. Neil said. “But I know you guys will do great, just forget about the time we played them before, forget about every other match we have played in, just focus on today.”

“We got this!” Abby interjected. “We’re smart and more than capable. Let’s kick come Ghost ass.”


“Sorry, Ms. Neil,” Abby said and continued like she had never been interrupted. “We are the
S.T.E.A.M. dream team. We can do anything.”

Sarah knew that this would be her match. After running into Simon earlier in the day, she was ready.

“S,” Sarah said putting her hand into the middle of the table. Tammy caught on quickly.

“T.” She followed.

“E,” Em said shoving a French fry into her mouth and then put her hand on top of Tammy’s.

“A,” Abby said.

“M,” Mags said, adding her hand to the pile.

“S.T.E.A.M. Team rules on three. One, two, three,” Abby yelled and their hands all flew into the air.

“S.T.E.A.M. TEAM RULES,” They sang out together.

Just then the waitress brought over the food and started setting the plates down in front of each of them. Sarah smiled and looked around. Everyone in the restaurant was staring at them. She started giggling.

“Why are you laughing?” Em asked.

“I don’t know,” she managed to snort out. Then Mags started laughing too. Soon all five of the girls were laughing and couldn’t stop. It was only when Tammy fell onto the floor, sending hamburgers and fries flying in every direction that Ms. Neil was able to calm them down enough to eat their lunch. All the butterflies that Sarah had in the last rounds were now gone.

Chapter 23: Emily

Walking up on stage Em saw that they had pushed back the accordion partition from the middle of the room to make one large room, and it was packed. She looked up trying to see her
mom, but couldn’t find her in the throng of people. Everyone was running around looking for seats like ants in a colony.

She watched the Ghosts walk in and gave Sarah’s hand a squeeze. Sarah looked more confident than Em had ever seen her before.

The Ghosts were in matching khaki pants and red polo shirts. One girl and four boys. All of them held their heads high and seemed unperturbed by the ants. Em saw Simon looking over at Sarah and gave him a small smile before going back to chewing on her bottom lip.

On her other side, Tammy tapped her foot incessantly. Mags tapped her fingers on the table, like she was doing a problem in her head, before there was even a problem on the board. Abby was muttering under her breath.

When the moderator got up on the stage Em turned her head away from her teammates and toward him. Then she was more than focused. She was ready. She was tuning everything else around her out and trying to focus on the task at hand. She was going to get it done. She was going do her best for her team and hopefully win.

“This is the finals for the Western North Carolina Regional S.T.E.A.M. Competition,” the moderator started and everyone in the audience went silent. “It is the same format as the other sections of the competition. There are thirty-two questions and up to ninety-six bonus questions. At the end of the questions the team with the most points wins. Are we ready?”

Everyone either shook their heads or answered yes. Em tried to look like she wasn’t nervous, but felt herself failing miserably. Sarah still looked confident, although she hadn’t taken her eyes off the other team.

“Ok, and just a reminder, push your buzzer as soon as you know the answer. Good luck and here we go. Question one. What word were you trying to type, on a qwerty keyboard, if the
fingers of your left hand accidentally slipped one key to the right and you typed ‘etsy’?”

Buzz.

“S.T.E.A.M. Team,” he pointed at them

“Wart.” Tammy answered quickly.

“Correct, points to the Dots,” the moderator said. “Now for the bonus questions.”

Em sat back a little bit, relaxing into the flow of the competition. Tammy answered all three bonus questions without hesitation. Tammy was on fire, Em thought, now it’s time for the rest of us to step it up!

“Question two: When these flow down a valley, they may erode its bed to as much as 800 feet below sea level. Global warming is likely causing their rapid retreat, which has drastically increased over the past fifteen years. What are these giant masses of ice which move over land?” Em saw Sarah push her buzzer.

Buzz

“Ghosts,” Sarah must have buzzed in just a second too late.

“Glaciers,” Simon answered.

“Correct,” the moderator said, “Now for the bonus questions.”

After a few more questions they all started to blur together. It seemed like the moderator was going faster and faster. Before Em knew it, it was the last question before half time.

“Question sixteen. Cells in this system include neurons and glia. What is this system which, in higher animals, has the functions of detecting stimuli, transmitting messages—”

Buzz. Em hoped it had been Sarah to buzz in.

“Ghosts.”

“What is the nervous system?”
“Correct,” Em sighed and didn’t need to hear the bonus questions.

“At half-time the score is 145 for the S.T.E.A.M. Team and 170 for the Ghosts.”

They got off the stage at half time for a quick break. She couldn’t help but to look out from the stage and try to find her mom. Sarah was beside her rubbing the medallion on her necklace between her fingers.

Em felt a tap on her shoulder and turned around to see who it was. When she turned, she couldn’t believe what she was seeing. It was her dad! She jumped up into his arms.

“Daddy!” She squealed and jumped into his arms.

“Two minutes until we start again,” she heard Ms. Neil say behind her.

“I’m sorry I couldn’t make it yesterday,” he whispered into her ear.

“That’s ok,” she wiped the tears off her face. “I’m just glad you are here now!”

“I’m so proud of you Em. You’re doing a great job.” He set her back down on the floor.

“Now go and win!”

Em couldn’t stop smiling as she walked back up on stage. She felt like a balloon had inflated in her chest and was about to bust. She gave a big smile to Sarah who didn’t look quite as happy.

“You got this,” she leaned over and whispered.

“Thanks,” Sarah took a deep breath that seemed to steel her resolve.

“Everyone seems to be here, so on to question seventeen. If the number of dogs in a pound is eight times greater than the number of cats, and there are 450 dogs and cats in a pound, how many dogs are in the pound?”

Buzz

“S.T.E.A.M. Team.”
Em could see Mags tapping away on her fingers, she only hesitated a second before she yelled out, “four hundred.”

“Correct, bonus one: What is five gross plus nine.”

Em looked down at Mags waiting for her to answer. For the first time she could remember Mags looked stumped on a math question. The team leaned together.

“I don’t know what a gross is,” Mags said.

“It’s 144,” Sarah answered immediately. She had learned all about dozens of dozens when taking inventory at the diner with her mom. They went through a lot of eggs.

“Okay so five times 144 is 720 and 720 plus nine is 729.”

“Say it.” Abby nudged her.

“Five seconds left to answer,” the moderator interrupted them.

“No, Sarah should say it.”

“Okay,” Sarah said. Em felt like her stomach was going to fly away. She leaned back in her chair, she hoped Sarah was right.

“The answer is seven-hundred and twenty-nine,” Sarah said and the whole team held their breath.

“Correct.”

“Yes!” Sarah and Simon both shouted. The audience laughed, but her teammates smiled.

“One minor character in this work is as weak as can be, as strong as can be, as smart as can be, and as stupid as can be. Another introduces himself with the lines ‘My angles are many. My sides are not few.’ That character appears in a scene where, the more that the characters eat, the hungrier they become. What is the book by Norton Juster, in which Milo, Tock, and the Humbug travel to rescue Rhyme and Reason?”
Em had no idea, and there was no immediate buzz. Abby had her eyes closed and was concentrating hard. She looked over to the other group. Everyone over there looked just as clueless as she was.

Buzz. Abby had pressed the button.

“S.T.E.A.M. Team.”

“The Phantom Tollbooth?” Abby answered with a question. She didn’t look sure. Sarah held her breath.

“Correct,” the moderator said.

The girls all gave each other high fives and smiles. They still had a long way to go if they were going to win this thing, but they were catching up.

“Next question. This type of radiation has a wavelength of 10 to 400 nanometers, giving it a shorter wavelength than visible light. Exposure to this radiation leads to the synthesis of Vitamin D in humans. What is this radiation, which is given off by black lights, and which may cause sunburn?”

Buzz

“Ghosts.”

“Ultraviolet,” the girl piped in. The Ghosts answered the bonus questions quickly.

“Correct,” the moderator said, “Next question. The ‘slow match’ variety of these was frequently covered with potassium nitrate. Name this device, essentially a long cord of waterproofed fabric with a core of gunpowder, which is used to fire an explosive charge.”

Em didn’t know the answer.

Buzz

“Ghosts.”
“A fuse?” The small boy who answered could barely stutter out the answer. He seemed more nervous than the rest of them combined, but he answered the bonus answers just as quickly.

“Correct. Next question. The formula to find this quantity is mass divided by volume. For water, this quantity is about 1.0 grams per cubic centimeter, though it changes with temperature. What is this property of liquids?”

Em saw Sarah push her buzzer.

Buzz.

“S.T.E.A.M Team.”

“Density,” Sarah said.

“Correct.”

Em let out a long breath, they were still in this round. She could tell Sarah’s confidence was going up and getting the bonus questions right only helped.

“Next question. Find two consecutive integers whose sum is 77.”

Em tried to focus on the question, but she knew she had never been very good at math and wasn’t too worried about it. She could see Mags typing out the problem on her fingers.

Buzz.

“S.T.E.A.M. Team.”

“Thirty-eight and thirty-nine.”

“That is correct,” said the moderator in his deep voice. “Ok, the two teams are only ten points away from each other. This is the last question of the round. Whichever team answers this question will win the round and the tournament. Here we go. The angle of incidence of light rays striking a flat surface is 47 degrees. What is the angle of reflection for these rays?”

Em pushed her buzzer.
“Ghosts.”

“Aww,” Abby said. They were not the first team to chime in.

“What is forty-seven degrees?”

“Correct,”

Shouts were heard from the Ghost’s table, “And that ends the tournament today,” the moderator was still talking but Em couldn’t hear anything he was saying over the shouts and cheers of the other team and their families.

Em put her arm around Sarah’s shoulders as they walked off the stage.

“We’ll beat them next time,” Em said. “You did awesome.”

“Thanks,” Sarah said.

Em made her way over to her dad. He gave her a great big hug.

“You’ll get them next time,” he said. “Your mom said that since you came in second you still get to go to state.”

“Yeah, I just hate losing.”

“Just like your old man.” Em smiled up at him.

“Mom!” Em heard Sarah yell, “I didn’t thing you were going to make it.”

“Dave gave me the day off!” Her mom pulled her into a big hug. “You were amazing out there.”

“Thanks.” Em saw Sarah blush.

“I have something that might cheer you all up.” All the girls and families gathered in a circle around Sarah’s mom.

“What is it?” Abby asked.

Em put her head in-between Tammy’s and Ms. Neil’s so she could see.
Sarah’s mom moved away from the table behind her.

“Dave sent me with pies for the whole team!”

All the girls squealed. There were five pies lined up across the table. Each one with a different letter spelling out the word S.T.E.A.M. and all in their favorite flavors.

Erin DiStefano

During Women’s History Month (March) of 2019 NASA was scheduled to have the first ever all women spacewalk. The walk was cancelled because there were not enough functioning space suits to fit the women. They only needed two. This is just the latest metaphorical straw on the camel’s back of how females are treated in S.T.E.M. (Science, Technology, Engineering and Mathematics) fields—as second class.

Dialogue of females in S.T.E.M. is constantly happening in the media. With article upon article about this incident, I only found one, Why NASA Cancelled the All Female Space Walk, published by Forbes getting to the crux of the issue:

Men are inherently seen as more capable in science, tech, engineering, and math and therefore the focus for resources remains around a man’s needs and perspective… closing the gender gap in tech requires earlier interventions to expose girls to STEM and inspire their technical confidence and interest. Many efforts to get woman interested in fields like computer science begin too late…[we should be] educating and exciting girls as early as Kindergarten in coding and science...before pre developed stereotypes can set in and dissuade them from building a passion in STEM. (Howell, 2019)

The crucial turning point for girls is their Middle School years. This critical time is called the “middle school dropout point.” (Anderson, 2013, p. 7) This is the time when all students, but particularly females, are most likely to succumb to peer pressure. Girls will start to notice the lack of female role models, which is where S.T.E.M. literature becomes vital.
S.T.E.M. children’s books have rapidly been gaining in popularity over the past decade. Picture books like Rosie Revere, Engineer by Andrea Beaty and the board book series Baby University with titles such as Quantum Physics for Babies and ABCs of Biology make it obvious that literature and S.T.E.M can be combined to make wonderful books for children of all ages. On the surface this is a positive trend, but there are a couple of glaring downsides. First, is the lack of S.T.E.M. books with female protagonists. And second, is the shortage of diverse points of view (this is not only a problem in S.T.E.M. literature, but all literature). In my thesis, both issues are tackled, adding to the ever expanding S.T.E.M. cannon.

In my creative thesis, S.T.E.M. has been expanded to S.T.E.A.M. (the ‘A’ stands for Art) because the inclusiveness of the creative is a very important facet in the development of well-rounded students who turn into innovators and leaders in the future. In the book, Why Science Needs Art: From Historical to Modern Day Perspectives by Roche, Commins and Farina, they write that there is a, “reciprocal relationship of these two routes [art and science] …of art underpinning science and science enriching art. They…once were one, and…are converging once more.” (Roche, Commins, & Farina, 2018, p. 4)

In this paper, I will cover the four major ideas in my novel. First, the lack of females in S.T.E.M. and how I make that the central topic of my thesis. Second, why the chapters are divided into different points of view. Third, the strong character development to make strong role models for readers. And lastly, how art is a catalyst to connecting more girls to S.T.E.M. centric ideas and futures and hence why I choose to focus on the integrated approach of S.T.E.A.M.

The S.T.E.M. Problem:
Middle school is the time that more females start to fall behind or become disinterested in S.T.E.M. There are many reasons for this disconnect between the number of girls who are interested in S.T.E.M. fields when they are younger, to the number of women pursuing those careers.

The current understanding of this leaky science pipeline – in which girls and women drop out of either the pursuit of STEM careers or actual STEM careers once they get there – is manifold in nature. There are multiple, interacting, potential reasons. These include related factors such as lack of role models, cultural conditioning through media, stereotypes, and teacher bias (including unconscious or conscious attitudes and beliefs that declare girls as less able than boys and therefore, leading to differences in teaching or encouragement). Yet the reasons also include effects from such factors. These other factors include lack of confidence, lack of support at home, in the classroom, or from other authority figures, and lack of peer group support. (Anderson, 2013, p. 10)

This is why S.T.E.M. literature featuring strong females is so important. It acts as a support and confidence booster when many girls can’t find advocacy at school or in the home. While S.T.E.M. books have recently become increasingly popular, Google searches for ‘Middle Grade STEM books’ mostly reveal nonfiction or titles with male protagonists. And while any S.T.E.M. title is a step in the right direction, there needs to be more diverse voices.

Some popular new S.T.E.M. titles with female protagonists are Girls Who Code by various authors including Stacia Deutsch, Reshma Saujani, Jo Whittemore and Michelle Schusterman and the Ada Lace series by Emily Calandrelli. Both series are geared toward a slightly younger audience than my thesis. When I started the journey of writing this book, I envisioned elementary-aged characters who would populate chapter Book. However, the characters evolved to become seventh graders. Middle School is the perfect age to address the long-held stereotypes of girls not being good in Math and Sciences and stop the “leaky science pipeline”.
Middle grade readers will appreciate the S.T.E.M. included in the book and with the multiple POVs, they will find at least one character with whom they can relate. Tammy, one protagonist, exhibits confident in her knowledge, even if she questions her abilities. Sarah fears public speaking, but overcomes this when she learns to talk about her problems instead of holding them in.

Many S.T.E.M. titles have the S.T.E.M. aspects woven into the storyline. Books such as A Wrinkle in Time by Madeleine L’Engle (which was written in 1962) and From the Mixed-Up Files of Mrs. Basil E. Frankweiler (written in 1967) by E.L. Koningsburg are considered S.T.E.M. titles, due to the science subtly woven into the text. For example, in A Wrinkle in Time when Meg and Calvin have this exchange: “‘What’s a megaparsec?’ Calvin asked. ‘One of Father’s nicknames for me,’ Meg said. ‘It’s also 3.26 million light years.’ ‘What’s E=mc^2?’ “Einstein’s equation.’ ‘What’s E stand for?’ ‘Energy.’ ‘m?’ ‘Mass.’ ‘c^2?’ ‘The square of the velocity of light in centimeters per second.’” (L’Engle, 2012, pp. 44-45) This constitutes a very normal interaction between the two characters. This mirrors others books, where the S.T.E.M. is part of the characters’ everyday interactions, (Beaty, 2013) (Ferrie, Quantum Physics for Babies, 2017) (Ferrie & Florance, ABCs of Biology, 2018) (Calandrelli, 2017) (Koningsburg, 1998) not something they specifically set out to do—like a science club or competition.

In more recent titles the S.T.E.M. parts of the story are more overt and less subtle. The back cover for the first Girls Who Code shows this. “Loops, variables, input/output—Lucy can’t wait to get started with the new coding club at school…All she wanted to do was make an app that she believes will help someone very special to her.” (Deutsch, 2017) With my thesis, science and math form the spine of the text both in terms of information and plot. Tammy’s main conflict directly relates to her own passion and skill—technology. She accidentally drops her phone in
the school toilet and it goes haywire. This causes a text conversation to accidentally be queued to go out to the whole school. She decides to hack into the school’s database to delete the message before it goes out.

While the girls always solve their own problems, they never lack support, especially when it comes to their S.T.E.A.M. Team advisor, Ms. Neil. She picked each girl for her specific strengths. She pushes them when they need guidance and support, yet never micro-manages any situations. Ultimately, she serves as a powerful role model for the girls.

The positives of multiple POV’s:

Middle grade books written from multiple character’s point of view (POV) present three main challenges: the difficulty of POV character transitions, the burden of developing full characterizations for multiple characters, and the challenge of making each storyline equally as compelling. In other words, each character’s storyline must be “memorable enough to the reader to ‘survive’ the interruption of another viewpoint.” (Brisendine, 2017) By studying mentor texts, I was able to overcome all of these obstacles in my own writing and effectively weave the S.T.E.A.M. theme throughout the story.

Making sure that every POV switch is easily recognized by the reader is essential. “Unlike adult books with multiple viewpoint, where authors feel free to change POV characters in the middle of a chapter, a scene, or even a page,” (Butts, 2014) this is something that should be generally avoided in most commercial middle grade fiction. Younger readers need strict delineation from one character to the next to be prepared to view the world in a different way.

I first came up with the idea to have the story told from multiple POVs while reading the The Mother Daughter Book Club by Heather Vogel Frederick. In Frederick’s middle grade series
the four main characters--Emma, Megan, Jess and Cassidy--each get their own chapters. Frederick has each chapter headed with the name of the POV character. In Frederick’s novel, the fonts align with the POV characters’ personalities (very formal strict script for the rule follower, handwritten messier script for the tomboy, etc.) These serve as both simple and effective ways to make sure the reader knows whose POV they will be encountering.

When writing from multiple POVs, the writer must be able to balance the character growth of multiple characters over the entire book. In The Magic Words: Writing Great Books for Children and Young Adults, Editor and Author Cheryl B. Klein, Klein states, “I expect characters to acquire more dimension and depth…as I read along. If I know everything about a protagonist from the beginning…the action will likely feel inconsequential and thus dissatisfying.” (Kline, 2016) Without character growth and development, everything else in the book will unravel. The View from Saturday by E.L. Koningsburg is a prime example of strong character development. The four protagonists are expertly developed, working together and complimenting each other’s positive and negative attributes to win the Academic Bowl competition.

My novel also has the idea of a competition to bring all the characters together and help to fuel their development. Each girl has their own unique perspective on life because of their past experiences. Sarah is half Cherokee, and her father passed away and struggles with getting enough attention from her mother. Emily, who is white, has a father who is away in the Army and she is constantly disappointed because his job takes him away from home. Tammy, African American, is into sports and looks up to her two older brothers who just left for college. All three of these characters have the common thread of some form of abandonment and how they are adjusting to these major changes in their lives.
I made a deliberate decision to not include the POV of two other main characters, Abigail (Abby), a popular 'mean' girl whose fall from grace is anything but graceful and Margaret (Mags), the new girl and self-proclaimed ABC-American Born Chinese, who wants to make friends. Em, Tammy and Sarah are the core three who have been friends since they were little. Both Abby and Mags are initially outsiders to the group, who work their way in and help to solidify them all as a team. With the help of the two other protagonists, Abigail (Abby) and Margaret (Mags), Sarah, Em and Tammy can use their strengths and weaknesses to bolster each other.

Each girl is further delineated through the S.T.E.A.M. theme. Sarah is focused on science and sees the world differently because of it. In chapter fifteen Sarah describes the girls running down the stairs in scientific terms—calling them a parade of elephants or a leap of leopards. Tammy, Em, Abby and Mags also have specialties specific to S.T.E.A.M. and woven through my thesis are habits and characteristics that support their interests. Abby focuses on art—sewing her own clothing and being the main designer for the team’s banner.

Wonder by R.J. Palacio is another popular book with varying POVs. Where Palacio shines is the memorability of all the characters. Even though they all exist in the same world and experience the same things, they have such different views of events, and each one adds depth to the story. Auggie, the protagonist, has always been looked at and judged by others because of his facial deformity. Through each new POV, we see some of the same incidents, but with a completely new perspective. Palacio throws us into the deep end, by starting with Auggie’s voice, but throws us a life preserver when she jumps to other POVs, such as Via (Auggie’s
sister) or Jack (Auggie’s best friend). It’s not that readers can’t relate to Auggie being different due his deformity, but grasps onto Via and Jack’s more familiar POV.

The main thing gained from POV variation is seen here:

What does multiple POV accomplish that single POV cannot? I think Palacio says it best. It’s a way to help young readers see many different sides of a story. Kids tend to be very ego-centered. I don’t mean that they are selfish; I mean that they tend to even more than adults to see other people as reflections of themselves. That is probably why single POV is so effective in gaining young readers’ attention, because it mirrors their own experience of life. But that may be precisely why a multiple POV book is a refreshing change of pace for kids. It knocks the glasses they’re used to wearing off their noses, so they are forced to look through someone else’s lenses and discover that not everybody sees the world the way they do. There aren’t just two sides to any story; there are a thousand. Shifting between several different viewpoint characters encourages readers to imagine how one event can be experienced in unexpected ways by a variety of different people. (Butts, 2014)

Writing from different POVs came naturally when writing this story. I felt like the entire novel couldn’t just be told from one perspective or another. Each is necessary and varied. Although at points, it would have been easier to write from one perspective, the story is enhanced from the multiple perspectives and would be a lesser work without them.

Strong Girls:

Strong character development is essential to a satisfying novel. Once you have established a protagonist in the beginning chapters, then it is time to force them to change by offering challenges. Without change, there is no reason for your story, no action to keep your reader reading. “Change should result from the events and consequences they [your characters] encounter at each of the major, transformative turning points in your plot…Your protagonist should not be exactly the same at the end as she was at the beginning, and her change must be earned and believable.” (Rosenfeld, 2016, p. 63)
The S.T.E.A.M. Team is the common thread keeping my characters together. The practices and competitions are ways for the protagonists to interact with each other and grow together. The reader can see what each girl brings to the team, through their unique knowledge and personality, and how the girls learn and develop as characters. While S.T.E.A.M. facts are prevalent, they are not what moves the story and characters along. It is the interactions between themselves the fuels the change.

This change will show readers that they, like the characters, will grow and develop into their own skills. If the characters are stagnant through the book, young readers will have no reason to engaged with the characters. With the three POV characters, there are three major character arcs vying for the reader’s attention. Each one should be unique and relatable. Sarah, unlike the other girls, finds growth opportunity outside of her close group of friends. At the very beginning of the novel, she encounters Simon, an old rival from elementary school and he weaves into her story to become a major catalyst in her change.

To help with developing strong characters, I also gave them strong S.T.E.A.M. role models. One of the subplots of the book, mainly in Tammy’s POV chapters, is a history project. Each girl must put together a history presentation and write a paper on someone who has inspired them. I chose each of their history topics from reading the book Women in Science: 50 Fearless Pioneers Who Changed the World by Rachel Ignotofsky. Tammy completes her project on Annie Easley, an African American computer programmer and mathematician. Mags does her presentation on Miriam Mirzakhani, an Iranian self-taught mathematician who had solved many of the world’s ‘unsolvable’ mathematical problems. I tried to relate their role models directly to them and their S.T.E.A.M. interests, to show the reader that there are people just like you who achieved amazing things.
Each girl, even if there are not chapters from their POV, grow and change through the book. Abby decides that being popular isn’t worth being unhappy. Mags shares her own insecurities and becomes part of the group.

Art as a catalyst:

Art and the sciences are seen as being on opposite sides of the academic spectrum and “…these contrasting views of art (as creative and unstructured) and science (as rigid and less creative) reflect views of the disciplines that do not include more nuanced views of complex practices within each. This represents an opportunity for how a S.T.E.A.M. approach could highlight the overlap in practices between the different S.T.E.M. disciplines and art, and the role of creativity in each.” (Tsurusaki, Tzou, Carsten Connor, & Guthrie, 2017)

With the inclusion of art, readers are more likely to see S.T.E.M. as something fun and imaginative. It will widen views on the subjects and offer an opportunity to explore creativity. At one point, Em, Abby and Sarah are all at Em’s house tie-dying t-shirts for the S.T.E.A.M. Team. Sarah’s curiosity prompts her to ask her phone how tie-dying works and then reads the explanation out loud for Abby and Em to hear. This is a simple, but effective way to show readers how easily art and S.T.E.M. are combined.

"How narrowly or broadly youth conceive of a discipline has implications for how they can identify with that discipline" (Tsurusaki, Tzou, Carsten Connor, & Guthrie, 2017). By blurring (or in some cases) getting rid of the line between art and S.T.E.M. girls are more likely to become engaged with both. And by keeping these lines blurred, they are more likely to thrive when faced with obstacles or complication in their learning S.T.E.M. Ms. Neil, the girls’ advisor, has them work together to make a solar cooker during one S.T.E.M. team meeting. The girls
devise a way to cook hotdogs and s’mores for a nice afternoon snack, adding the culinary arts to
the story as well.

Art and science overlap in many fundamental ways:

…They are both interested in reducing the infinitely complex to something simpler: the
intricate structure of a tree to a few strokes of a brush; the relationship of matter and
energy to a single, concise equation. They both strive to express that which is difficult to
comprehend in a purer, more elegant way…artists and scientists spend much of their time
looking before they act.” (Roche, Commins, & Farina, 2018, pp. 1-2)

Abby, as an artist, helps the S.T.E.M. characters to develop their own artistic view. For example,
when she finds Em’s sketch book and compliments Em’s drawing abilities, while also marveling
at her ingenuity.

It is obvious that art and S.T.E.M. can be woven together in many ways, but "… more
work needs to be done to determine similarities and differences in creativity in art and science
and how they can be developed in complementary and intersecting ways to engage students in
science." (Tsurusaki, Tzou, Carsten Connor, & Guthrie, 2017) With the arts being taken out of
schools at an alarmingly rapid pace, having these overlaps is even more crucial in books.

Conclusions:

The lack of females in S.T.E.M. is a major problem. While it can’t be fixed with one
book, it was an easy problem to tackle by making my main characters all female. Also, by
finding mentor texts with female protagonists, those narratives helped me to write more realistic
and varied tween girls. A multi-voiced text shows readers that there is not one way to look at a
situation.

Additionally, I used robust character development to create strong role models (including
adult mentors) for readers. When the characters change and grow through the course of the
narrative, it helps readers to relate and empathize with the characters. Connecting with readers at the right moment and with the right voice is crucial.

And finally, connecting art to S.T.E.M. will create accessibility for underserved demographics. In my thesis, I use the idea of involving more girls in S.T.E.M. combined with artistic expression to show the potency of these connections.
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