

CHAPTER 1: THE BASICS OF BOTANY

Memories on the Horse Swing

She smiled as the wind whipped gently through her hair. Her upward motion gracefully stalled before back down she went, in the opposite direction. A peaceful smile had found its way to her face, and there was no sign of it leaving any time soon. Tracey Sassafras gripped the rope tightly, happily kicked out her legs, and continued her relaxing ride on the horse-shaped tire swing.

Her uncle and brother had gone back inside, so she was left alone in the backyard with nothing to do but swing and daydream. She and her twelve-year-old twin, Blaine, had arrived at their Uncle Cecil's doorstep only a couple of weeks before, though it seemed like much longer than that now. They had both failed their science class in school this past year, so their concerned parents had packed them up on a bus and sent them to their uncle's home. The plan was to make Blaine and Tracey spend the duration of their summer break studying science again.

As they stepped off the bus, the twins had resigned themselves to spending the time being bored to tears. They knew their uncle was a bit of an eccentric scientist, but they were sure that even he couldn't make science fun. The twins were shocked to discover that Uncle Cecil had invented invisible zip lines that had the ability to whisk a person to any location on the globe at the speed of light. It was Uncle Cecil's belief that the best way for the kids to learn science was not sitting in a classroom with their heads in a book. Instead, they should be out zipping around the globe experiencing science face-to-face. That is how he believed they would not only learn but also fall in love with science.

All one needed to make these lines work was a specially designed three-ringed carabiner. One ring was set to the desired

longitude coordinate, one ring was set to the latitude coordinate, and the third ring locked the carabiner. With this device, the person was also kept safely connected in the harness to the invisible zip line. When Cecil had first explained all of this to the twins, they had thought their uncle had truly lost his mind. However, they had humored him, put on the harnesses, calibrated their three-ringed carabiners, and zipped across the invisible lines themselves. As irrational as it sounded, it really did work. The twins had spent the past two weeks using the unseen lines to zip to different locations all over the planet studying scientific topics related to zoology and anatomy.

At the start of their zip-lining adventures, they had despised science with a passion. The twins had considered it to be a long list of boring facts, but as they were encountering science face-to-face, their disposition toward it was changing. These days, Blaine and Tracey not only liked science but were also learning to love it.

The only hindrance on their path of increased desire to learn science was a certain mysterious man who had no eyebrows. He had tried to derail their progress at nearly every stop. He had left them marooned out in the grasslands of Kenya among deadly predators. He had trapped them in a cobra-infested tomb in Egypt. He had helped cut down a tree out from under them in Peru. He had sabotaged their uncle's computer—sending the twins zipping off on the invisible zip lines to two different countries. He had chased them using a disappearing magician's suit and cape. Plus, Tracey was pretty sure he was the one who had trapped her and Blaine inside a couple of virtually indestructible, soundproof boxes, which had almost caused them to be buried alive. In fact, Tracey had her suspicions that this man was always lurking around, causing problems that she and Blaine weren't even aware of.

Tracey shuddered on the swing as she pictured his scowling face. Her frown disappeared in a flash of joy and confidence as she remembered that the Man with No Eyebrows hadn't stopped them yet! She was bound and determined to keep moving forward to learn

science, and she knew that Blaine felt the same way.

Tracey was lost in her memories when a soft thud broke her reverie. Her focus snapped back to the present, and she looked down at the green grass below to locate the source of the sound. She gasped as she saw that her smartphone had fallen out of her pocket.

“Whew,” Tracey thought. “That could’ve been bad. This device is far too important to lose or damage now.”



The agile twelve-year-old reached out and grabbed the phone as she passed by on the tire swing. She and Blaine both had one, which they used for more than just making calls, surfing the Internet, or playing games. The smartphones were the key to guiding the Sassafras twins on their journey. Uncle Cecil, with the help of his lab assistant prairie dog, had created several applications—the two most important being the LINLOC and SCIDAT applications. LINLOC stood for “Line Locations,” and it gave the twins the longitude and latitude coordinates for each location that they were slated to visit. This application also listed the scientific topics they would be studying and the name of a local science expert who would help facilitate the twins’ learning.

The other app, SCIDAT, stood for “Scientific Data.” This is where the twins recorded all of the information they were collecting. At each location, they entered the data they had learned into their phones and then sent it back to Uncle Cecil. This step was very important, because if they didn’t send in the scientific information correctly, they wouldn’t be able to open up the LINLOC app and go to their next location. In order to progress, Blaine and Tracey had to first gather the correct scientific facts.

At first, the need to get it right had put a lot of pressure on the twins. Now, after successfully zipping their way through zoology and anatomy, recording data was second nature to them. Their devices were also equipped with an archive app, a microscope app, and high-resolution cameras. All of these tools enabled the twins to send images of the subjects they encountered to Uncle Cecil.

Tracey closed her eyes, sighed peacefully, and continued swinging happily back and forth in the cool shade cast by the tree. She let her mind wander, thinking less about how things worked and more about all of the adventures she and Blaine had been on in the last couple of weeks. The tire swing moved gracefully back and forth through the afternoon calm. She was imagining she was back in Italy, riding in a motorcycle side car through the beautiful Venetian countryside, when she was interrupted by a familiar voice. “Tracey, I’ve got a glass of lemonade here!”

She opened her eyes and looked toward the back porch of the house where she saw her twin brother, Blaine. He was holding a big glass full of ice-cold lemonade. “Could this day get any more relaxing?” Tracey thought to herself. “First my own quiet and peaceful turn on the tire swing, and now my brother is bringing me a glass of lemonade.”

Tracey quickly hopped off the tire swing and skipped toward the back porch. She reached out to grab the waiting glass of lemony refreshment, but just as she did, Blaine jerked the glass away. He put it up to his own mouth and drank the icy-cold glass in one

long gulp. Tracey's joy turned to disgust as she crossed her arms and stood silently in front of her brother with a scowl on her face. Blaine reached up, wiped his mouth, and then let out a satisfied sigh. A half-smile half-smirk formed on his face as he stood there looking at Tracey, obviously enjoying that he had fooled her.

"I said, 'I've got a glass of lemonade here,' not 'I've got a glass of lemonade here for you.'" Blaine grinned with a cocky squint.

Tracey reached up and flicked her brother on the ear. "That wasn't very nice, meanie."

"Ouch!" Blaine smiled as he reached up to rub his ear. "Ok, ok! I was just kidding. I poured a glass for you, too. It's inside on the kitchen table."

Tracey joined Blaine in laughing as they went inside. While she gulped down her own glass of lemonade, Blaine said, "The Prez is ready to give us his presentation."

Tracey nodded, knowing exactly what her brother meant. She finished the last few drops of lemonade and then followed Blaine down to the basement. Upon their arrival, they were greeted with a shout of elation from their uncle.

"Howdy-hootie! Hello! You two super-azing Sassa-ma-fras twins!" Cecil ran over to them with outstretched arms and crazy red hair sticking out every which way. He grabbed them by the shoulders and led them over to his computer desk excitedly.

"These two science whiz-kids have now successfully completed zoology and anatomy!" Cecil announced as if he were before a large crowd. Then, he held his hands up to his ears as if the nonexistent crowd had not cheered loudly enough. He looked at two plastic mannequins standing near the desk.

"Did you hear that, Socrates? Did you catch what I said, Aristotle? I said these two fanterrific kids have successfully completed zoology AND anatomy!"

Socrates and Aristotle, the mannequins, remained still and

silent at the repeating of this wonderful news. The twins recalled how Socrates and Aristotle had started out as simple plastic skeletons. As the twins had proceeded through learning about anatomy, their uncle had added pieces to the skeletons until each had precisely represented a complete *Homo sapiens*. He had done this to show off all of the anatomy knowledge that the twins had acquired.

Cecil bounded over to the two mannequins and grabbed their arms. He made them move like they were clapping and made sounds like they were cheering for Blaine and Tracey. Over the past several weeks, the twins had become accustomed to their uncle's off-the-wall antics.

“And now that you two wonder-twins have successfully completed anatomy and zoology, we will move next to the photosyntastic subject of botany!”

Cecil raised both arms straight up into the air, with his fingers spread. “But first,” he declared, leaving only one of his index fingers raised, “the President will give his presentation on anatomy.”

The President that he was referring to was none other than his lab assistant, President Lincoln, the prairie dog extraordinaire. Lincoln was up on the desk with the computer mouse next to his paw, ready to give his presentation. Though they had seen proof after proof of his brilliance, the Sassafras twins still weren't exactly sure how a prairie dog had accomplished any of the feats for which Cecil gave him credit. For that matter, the twins did not even know how to communicate with him. However, here he was, once again impressing them with his abilities.

The Prez moved the mouse, and a picture of the prairie dog came up on the big screen on the wall behind the computer desk. This is what their uncle called the “tracking screen.” It usually had an illuminated world map on it with two little green dots that represented the twins. When they moved from location to location around the globe, he used this map to monitor their progress. This screen was also where he received and read all of the scientific data

they sent. He could also view the pictures they sent with the data.

Cecil read aloud the text that was printed over the image of the smiling prairie dog, “President Lincoln’s ever-so-brief presentation on anatomy: A review of the systems of the human body and their functions.”

The prairie dog tapped the mouse again as Cecil continued. “First, we have the integumentary system which covers and protects the body.” Pictures of skin, sweat glands, hair, and fingernails came up on the screen, and the twins smiled. They had taken the photos while they were in the United Arab Emirates participating in a one-hundred mile horse race across the Arabian Desert called the Wind Tower 100.

“Next, we have the skeletal system,” read Cecil. “This is the system that supports the body, protects organs, and permits movement.” Now Blaine and Tracey saw pictures they had taken of the skeletal system when they were in Ethiopia looking for the Seven Monk Tomb and the lost Ark of the Covenant. Blaine nodded and smiled. That had been a good adventure and a fulfilling science learning experience.

“Then, we have the muscular system which moves the body and helps to support it,” Cecil shared. This time, the twins saw pictures they had found using the archive application on their phones. They remembered that when it wasn’t possible to take actual photographs, they could skim through the archive app to pick the appropriate pictures.

“And then, we have the nervous system which controls the body and allows a person to think and feel.” There were more wonderful pictures from the archives on the phone.

“Fifth, we have the endocrine system which releases hormones that control many of the body’s processes,” Cecil continued. This time, pictures flashed up on the screen from the microscope application on the twins’ smartphones. What a crazy leg that had been! They had been chased all over an underground lab

by crazed robot squirrels. At least the twins had gotten the chance to see Summer Beach again. She was one of the twins' all-time favorite local experts!

"The circulatory system is next," Cecil read. "It carries materials to and from cells throughout the body." The twins were enjoying this review. It made them feel satisfied about all they had learned on their journey through anatomy. They could also tell how proud their uncle was of them, and even President Lincoln beamed with pride and admiration.

He clicked on the computer's mouse again as Cecil read for him. "The next system is the respiratory system. It delivers oxygen into the bloodstream." More archive images flashed across the screen.

"The eighth system to review is the digestive system. It breaks down food so that the body can use the nutrients inside. After that, we have the urinary system which removes waste materials from the body." Cecil paused, and Tracey shivered as she remembered what had happened to Blaine and her while they were studying the two systems. She wouldn't wish being trapped and buried alive in a box even on her worst enemy.

"Last but not least, we have the immune system!" Cecil stated jubilantly. "This is the system that defends the body against disease." Pictures from the twins' time in Bangkok, Thailand, came up on the screen.

Blaine looked at his sister as he said, "An apple a day keeps the doctor away. . ."

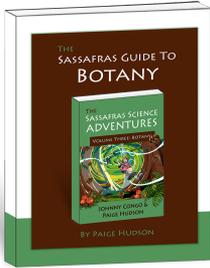
". . . that's what they say, anyway," Tracey finished, chuckling.

President Lincoln clicked the mouse one last time, bringing up the last picture. It was an image of him, together with Socrates and Aristotle, all smiling and holding up peace signs for the camera.

"Well, whippety whoppety whoo!" Cecil exclaimed. "That's a wrap for anatomy. Up next—botany, the study of plants. But before we talk about that, let's all take a walk together!"

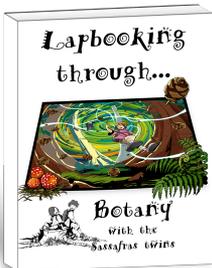
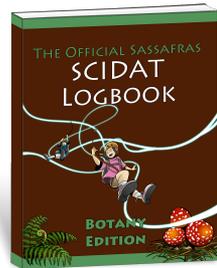
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The adventure doesn't have to end just because you've finished the book! Connect with the twins and the other characters of the series through the Sassafras Science blog. You'll find articles in which:

- ★ Uncle Cecil explains how to make a rocket at home;
- ★ The Prez shares his wrap-up videos;
- ★ Brock describes the Junior Ranger program;
- ★ Summer details the process of photosynthesis.

Plus, Blaine and Tracey regularly pop in to say hi and share their thoughts. The Sassafras Science blog is *the place* to get to know the characters of the series!

The Sassafras twins would also love to keep in touch with you through their Facebook page. They share updates about future books, fun science-related activities, and cool nature news!

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