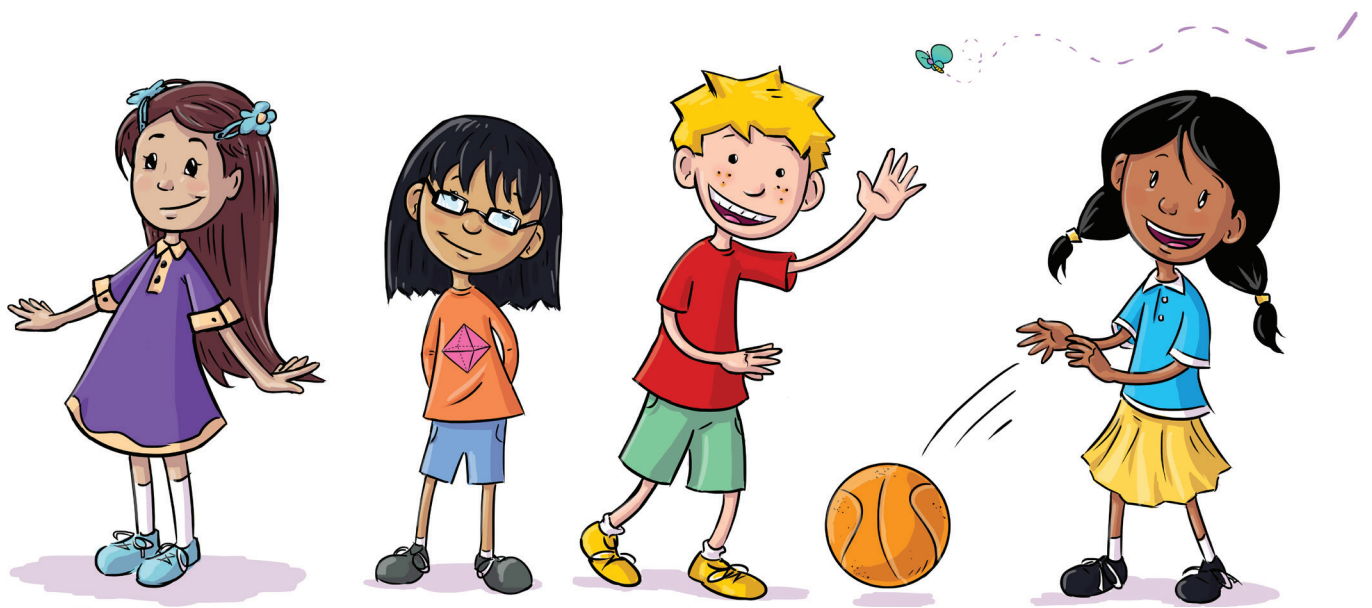


AWESUM ALEX Math Detective

The Subtraction Problem



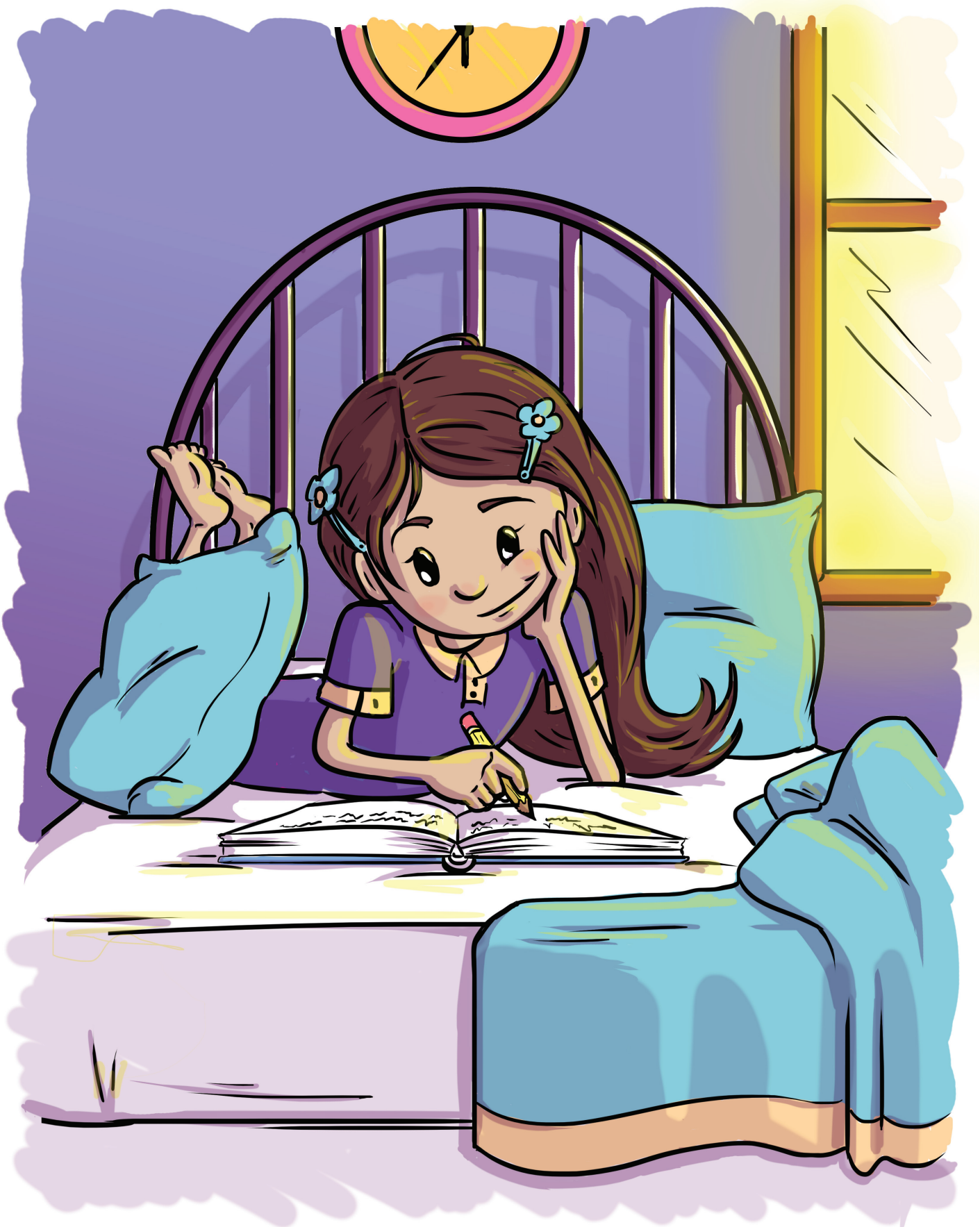
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Gray was awake. Today was her first day at her new school, and she was jotting down her thoughts in her notebook, which she had titled:

*Secrets of the World
According to Me,
Math, Art, Science, and Anything Else
I Discover to Be Absolutely True and Proven!*

She knew that it was early, but she had lots to think about. Would she like the new school? Would she make new friends? Would she like her teacher? It was hard moving to a new home and starting over again. Her parents had told her to give it time until everything fell into place, but still, she was nervous, and that's what she was thinking about that morning.

She was also setting up the tally sheet that she would use as she rode to school on the school bus. Gray was a secret counter. She had friends at her old school who were secret counters, too. She would miss them. She liked to count things: trees, cars, trucks, motorcycles—you name it, she counted it. So that morning she was making a tally sheet in her book so that she could keep a log of the number of different vehicles she passed on the way to school.

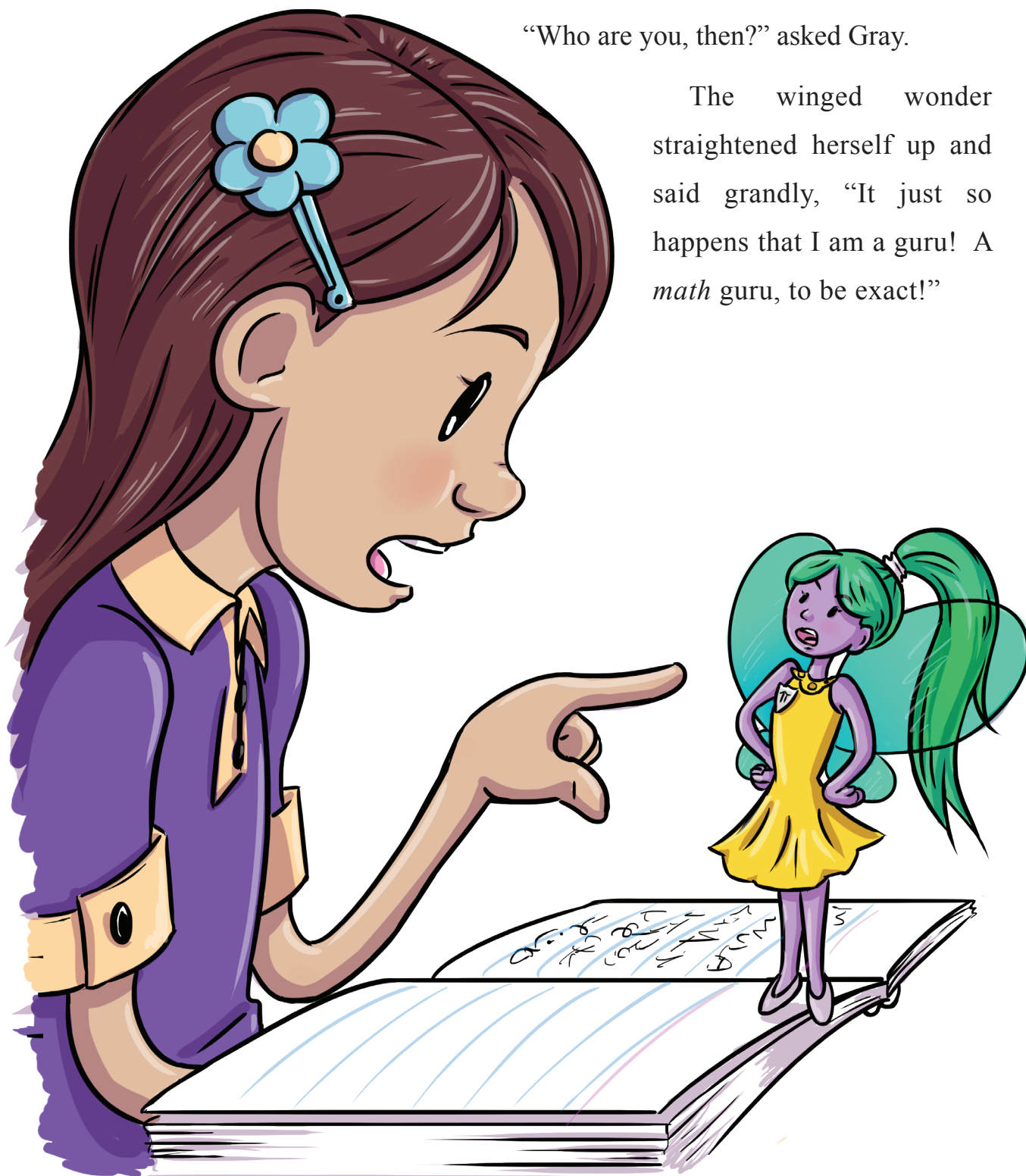
Suddenly and out of nowhere, a very small person appeared. She was standing on the corner of Gray's open notebook, tapping her tiny feet.

“Oh! Hello! Are you the Tooth Fairy?” asked Gray.

“The Tooth Fairy?” The tiny figure put her hand on her hip indignantly and said, “Certainly not!”

“Who are you, then?” asked Gray.

The winged wonder straightened herself up and said grandly, “It just so happens that I am a guru! A *math* guru, to be exact!”



“Oh. Sorry,” Gray apologized, “but I don’t understand.”

“I’m a powerful mathematician! I might be a little on the short side, but I push around some big numbers and ideas,” explained the small creature.

“Wow,” said Gray, “I’m happy to make your acquaintance. I’m Gray Hopper. And you are?”

“Detective Martha-Matrix, Private Investigator, at your service. Just call me PI. Besides being a mathematician, I also do a little investigative work on the side. Word on the street is that you’re new to this corner of the world and might like some help getting started.”

“That’s true. How can you help me?” asked Gray.

“Well,” said the petite PI, “I think you might like to meet Alex. She can see me too. Not everyone can, you know. You and Alex have a lot in common. Keep on the lookout for her.”

“I will. That would be wonderful.” Gray felt a surge of relief.

“I have to run now, kid,” said the miniature marvel, “but I’ll see you around. There are plenty of math mysteries to solve!”



Two blocks away, Alex Hypatia was waking up from a vivid dream. Martha-Matrix had been in it, and the tiny detective had told her all about Gray, a new girl that Alex was going to meet that day. PI had said that Alex would recognize the new girl because Gray was a secret counter—just like Alex. In the dream, PI had given Alex a glimpse of all the adventures that she and her crew of secret counters would enjoy. It was exciting, with lots of discoveries alongside their favorite math teacher, Mrs. Googol-Plex. Their classroom would become a magical place, and Gray would be a part of it.

The sun was shining, and Alex could hear the birds chirping outside her bedroom window. She loved to listen to their songs. The chirp, chirp, chirp rhythm always brought a smile to her face. She counted the sounds and identified the birds as she pulled back the curtains. It was a lovely way to wake up. She could hear her parents in the kitchen making breakfast, and she could smell the aroma of her father's pancakes ready for fruit and syrup. Yum!

Dressed and ready to go, Alex stopped at the top of the stairs. As she descended, she counted by twos: “Two, four, six, eight, ten, twelve, fourteen!” She wondered why we don’t say “ten-two” and “ten-four” and “ten-six.” It would be so much easier than those silly “teen” words.

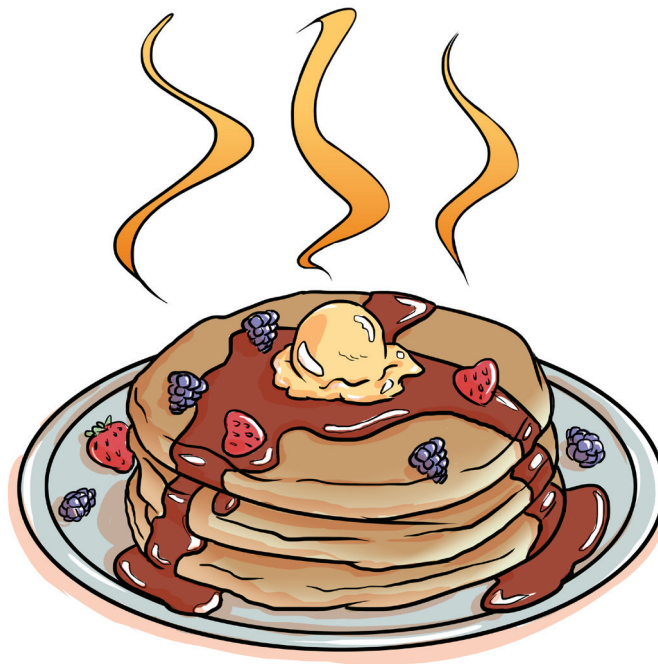


Alex's mother greeted her with a cheery, "Good morning, Alex. Are you ready for school?"

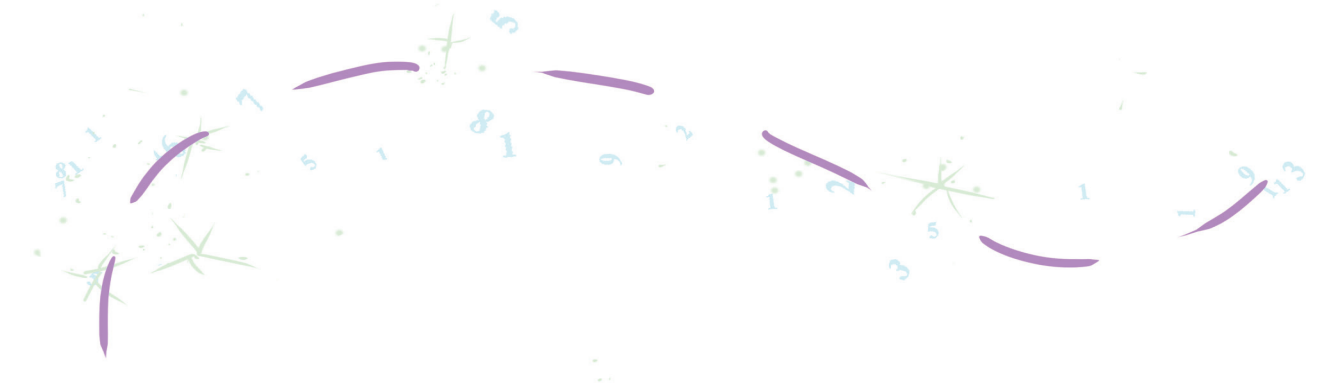
"Morning, Mom. Good morning, Dad. That sure smells good! Hi, Grace," she said to her older sister.

"Pancakes coming right up, sweetheart," said her father.

Alex looked at the pancakes on the table and noticed that they were in stacks of three on everyone's plate. She smiled and counted three, six, nine, twelve.... Alex loved breakfast!



After breakfast, Alex said goodbye to her family and skipped off to the school bus stop. There she met her best friend, Thomas. He was a secret counter, too. As they waited for the bus, they took turns counting the cars and trucks and motorcycles that went by. Each day they saw if they could break the previous days' record. But that morning was different: Alex was also waiting to spot Gray.



There she was! There was a new girl at the school bus stop. She had long brown hair and the biggest brown eyes Alex had ever seen. It must be Gray. She had a small notebook, and she was keeping a tally of the cars, buses, and motorcycles, too. Another secret counter!

Gray closed her notebook as Alex and Thomas approached. Alex stepped forward and said, “Hi! My name is Alex Hypatia. This is my friend Thomas Kepler, and we think you are doing something that we love to do!”

The girl looked at them, and with a soft smile, she introduced herself: “Hello. I’m Gray Hopper, and I just moved here. This is my first day. It’s nice to meet you. What do you think I’m doing?”

Alex’s eyes twinkled. “Are you counting?”

Gray smiled. “I am,” she said.

As the children began to talk, they discovered that they all loved counting things, and they all loved math. Alex and Thomas told Gray about their class and their teacher, Mrs. Googol-Plex. Gray could hardly contain her excitement. Maybe that tiny PI was right, she thought, and this truly was going to be a good year!



Alex said to Gray, “Since you like counting, maybe you can help me. My dad gave me a puzzle. It’s a checkerboard. He asked me to figure out the total number of squares on the board.”

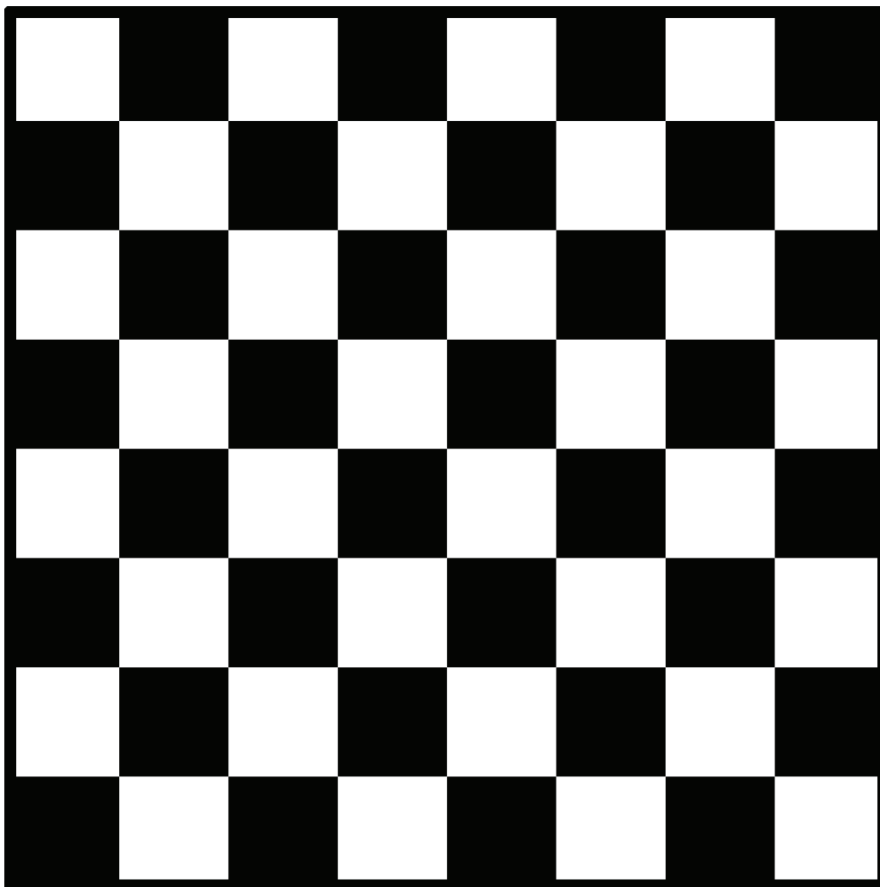
“That’s easy!” interrupted Thomas. “It’s sixty-four.”

“Yes, there are sixty-four,” said Gray, “but Alex's father asked for the *total* number of squares, which means that there may be more than sixty-four.”

“You’re probably right, Gray,” said Alex. “My dad never gives me something easy. It’s always more complicated than it appears. Right, Thomas?”

“That’s true,” Thomas admitted.

“Let’s think about it on the way to school,” suggested Gray.



Alex and Thomas agreed. Alex told her, “We’ll all walk to our classroom together, and we’ll introduce you to Mrs. Googol-Plex and our friend, Wu Li Chien.

“There’s a checkerboard painted on the playground,” added Thomas, “and we can look at that at recess. It might help us.”

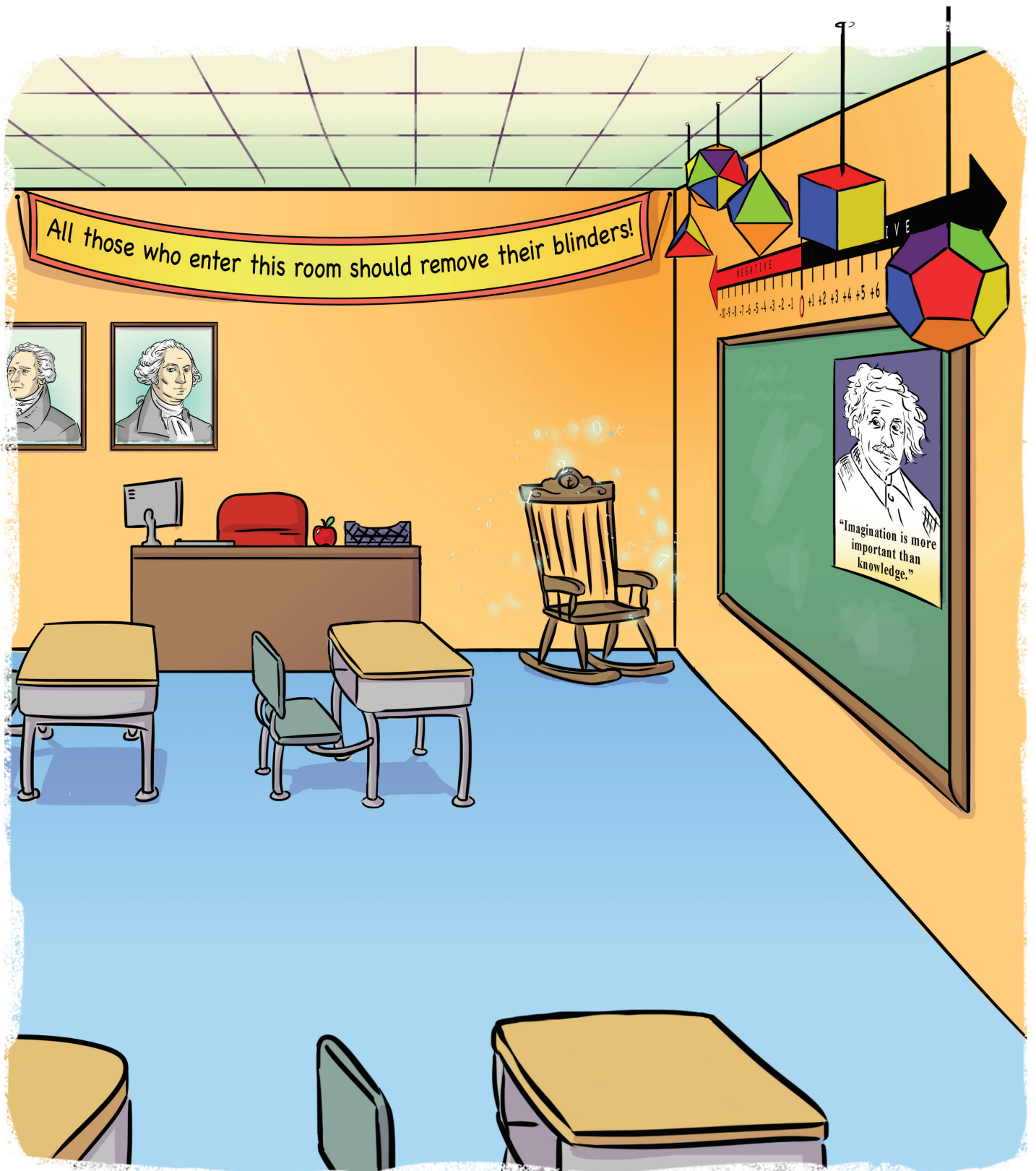
“You’re thinking like a mathematician, like Mrs. Googol-Plex always says, Thomas,” remarked Alex.

Thomas smiled.

Gray was smiling too as she entered her new school. She had already made two new friends, and the day had just started.

As they entered their classroom, they ran right into Mrs. Googol-Plex at the door talking to Wu Li. Alex and Thomas introduced Gray and shared that she too was a secret counter and loved math, so Mrs. Googol-Plex suggested that they think about starting a secret counters club. The four children looked at one another and smiled. What a neat idea!





Once all the children were seated, Mrs. Googol-Plex pointed to the pictures on the wall and to the banner above them and asked, “What do you think that banner means, class?”

“When my family was traveling this summer,” replied Gray, “we drove through Amish country. We saw farmers put blinders on their horses when they were plowing the fields. My dad had a chance to talk to one of the farmers, and he said they used the blinders so the horses wouldn’t be distracted by anything and would stay focused on what was ahead of them. They plowed in straighter lines that way.”

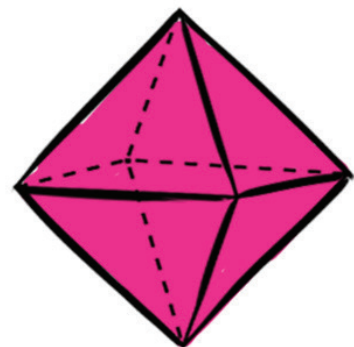
Thomas thought a moment. “Okay, I see,” he said. “Remember how I had blinders on about addition and thought we always had to add the ones place first? But now that I have learned about the associative property of addition, I’m not wearing blinders anymore. I know that I can add the hundreds first—really, I can add in any order! Isn’t that right, Mrs. Googol-Plex?”

“It is, Thomas,” she smiled.

Alex asked, “I know that subtraction is our next lesson, so you’re probably going to have us take our blinders off again, right?”

“Is taking off our blinders like thinking outside the box, Mrs. Googol-Plex?” questioned Gray.

“Yes,” answered Mrs. Googol-Plex. “We are all going to take our blinders off and think outside the box. Remember, class, for addition you broke out of the cube. This time you are going to break out of an octahedron! A cube has six sides, but an octahedron has eight sides, so that means we’ll need to think even deeper. Our next lessons are going to be about subtraction, and guess what? Subtraction is just shopping!”

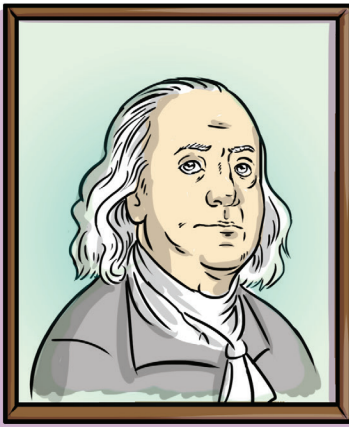


The buzz in the room began in earnest as the children got ready for math class to begin. Alex turned to Gray and said, “Sit by me! I’ll let you in on a little secret. I think we’re going to have visitors this morning.”

“What makes you say that?” questioned Gray.

“Well, yesterday Mrs. Googol-Plex talked about the pictures on the wall of the classroom,” answered Alex. “Did you see them under the banner?”

“Yes,” said Gray. “They are of Franklin, Hamilton, and Washington. I guess we’re going to study them in history.”



“Maybe, but the way Mrs. Googol-Plex was talking yesterday, I think we’re in for a surprise,” said Alex.

“What kind of surprise?”

“You’ll see.”