Professor Ginsboo's Story of *How Many*

Herbert P. Ginsburg

My story begins at the beginning, with nothing.

LESSON 1

One for all and all for one

OR

The one and not only one

One day, I, Professor Ginsboo, was deep in thought, strolling along a blank computer screen, when a little girl emerged to face me.

"Who are you?" she said.

"I'm Professor Ginsboo."

"What's a professor?"

"That means a teacher," I said.

"So teach me something!" she exclaimed.

"What's your name?"

"I'm Menette. I'm a student."

"OK, Menette, I, Professor Ginsboo, will teach you everything you need to know about math."

I was delighted to see that my generous offer put my new young student in a state approaching rapture. She said: "When I was a baby, I wanted to learn about math and I counted my first steps (but I only got up to about three)."

"Too bad you didn't ask my help then. But let's begin. Look around you, Menette. What's on the screen?"

Menette replied, "Nothing. It's blank. It's a primal void."

"You are a good student. Exactly. We start with nothing, with emptiness (except for us, of course). Now watch this."

As soon as I said that, a trumpet appeared!
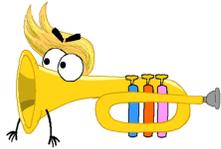
"I'm Teo the Trumpet. I can make very loud sounds."

Menette looked astonished. I, Professor Ginsboo, surmised (and needless to say, my surmises are always correct) that Menette had never heard of such a strange name as The Teo the Trumpet before, but she was polite and didn't say anything.

I asked her, "How many trumpets do you see?"

Menette responded, "One. Easy-peasy! Like, duh."

Teo the Trumpet said proudly, "There is one and only one Teo the Trumpet. I am I. I am the only Teo the Trumpet."

Menette said, "Like, Duh."

"Dear Menette," I said, "Professor Ginsboo sees that you still have a lot to learn about the number one. Now watch this."

Teo the Trumpet disappeared, poof, into the computer's RAM. Then a sound and…

"I am Katherine the Kazoo. I can make very funny sounds."

"Dear Menette," I said, "How many kazoos do you see?"

Menette responded, "One. Easy-peasy! Like, duh."

Katherine the Kazoo said proudly, "There is one and only one Katherine the Kazoo. I am I. I am the only Katherine the Kazoo."

Menette did it again. She said, "Like, duh." Sometimes modern children employ revolting language, but I, Professor Ginsboo, forgive them.

"Dear Menette, this might be harder than you think. Now watch this."

2

Teo the Trumpet suddenly appeared!

"Professor Ginsboo wants you to think. Is Teo the Trumpet one?"

Menette agreed.

"And is the Katherine the Kazoo one?"

Menette agreed.

Teo the Trumpet said, "There is one and only one Teo the Trumpet. I am I. I am the only Teo the Trumpet. I am one. You are not one."

But then Katherine the Kazoo shouted, "There is one and only one Katherine the Kazoo. I am I. I am the only Katherine the Kazoo. I am one. You are not one."

After that, Teo the Trumpet hit Katherine the Kazoo (who made a horrible kazoo sound of distress).

Katherine the Kazoo kicked the trumpet (who bellowed an ugly trumpet sound).

Menette started to cry. I, Professor Ginsboo, could see that the sounds and the fighting scared her. I surmised (again, accurately, I am sure) that she was getting very confused about one, and that she realized that one might not be so easy-peasy and like duh after all.

I told the musical instruments that they should be ashamed of themselves for hitting and kicking and making bad music. Then I said, "Dear Menette, please don't cry. Professor Ginsboo will explain everything.

 "First of all, Teo the Trumpet, you are definitely one. And, Katherine the Kazoo, you are definitely one. Now wait. Don't be upset again. Don't hit and don't kick. Lots of things are one. I'm one and Menette is one, and elephant is one."

Menette and Teo the Trumpet and Katherine the Kazoo were all shocked and said in unison: "How did this huge elephant get here on our screen?"

I said, "Don't worry. Elroy the Elephant is very sweet. But don't stand under him towards the back. Anyway, there are lots and lots and lots and lots of ones. One (and only one) Professor Ginsboo, one Menette, one Teo the Trumpet, one Katherine the Kazoo, and one Elroy the Elephant, one motorcycle, and one banana."

Everyone looked up and saw a motorcycle chase a banana across the screen and disappear.

Menette said, "Don't worry. That happens all the time."

Teo the Trumpet said, "I'm THE one," and he hit Katherine the Kazoo, who said, "I'm the ONLY one, not you," and she kicked Elroy the Elephant.

And Elroy the Elephant said, "I'm a REALLY BIG one," and he sprayed both Teo the Trumpet and Katherine the Kazoo with a huge splash of water—almost a Tsunami—from his trunk.

Menette and I had umbrellas, so we didn't get wet.

I said, "Dear everyone, I, Professor Ginsboo, have explained everything. We are all ones. You can still be the only Teo the Trumpet, and you can still be the only Katherine the Kazoo, and you can still be the only Elroy the Elephant. And I of course am the only Professor Ginsboo and Menette is the only Menette the student. So we are all one."

Looking confused, Menette said, "But we're all different. I'm a student and Teo is a trumpet and Katherine the Kazoo is a kazoo and Elroy is an elephant. We are all different!"

"Dear Menette, Professor Ginsboo wishes to calm you and explain. Yes, we are all different but at the same time we are all the same. We are each one! An elephant can be one, and a motorcycle can be one and a banana can be one."
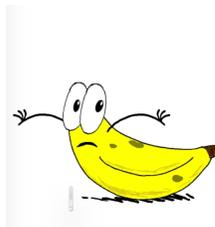
Everyone looked up and said, "There they go again!"

I said, "Professor Ginsboo wants you to pay attention.

"Anything can be one and one can be anything. All for one and one for all. Everyone is the one and only one. One here, one there, one everywhere."

I must admit that I, Professor Ginsboo, despite my exalted academic status, get very excited when I talk about one, the essential, unique one. Here a one, there a one, everywhere a one, one. One, you are glorious. I swoon over you, my darling one.

Despite my rapture, I didn't forget my responsibility to teach Menette math.

"Menette, what have you learned from Professor Ginsboo's remarkable lesson?"

"I learned that there are discrete elements, individual units that have the fundamental property of singularity. They may also have names and may also fit into broad categories. Also, from a psychological point of view, they may have feelings of uniqueness—a subjective 'me-ness' or 'one-ness' or sense of identity. All otherwise different units, whatever their names, categories or identities, are still units in that they share the abstract property of one-ness. One-ness is blind to exterior appearance, to fantasy or reality, and to size, color, pulchritude, or odor. One is an idea. "

"Well done, Menette. You learned a lot. You are an excellent student. This should come as no surprise. I told you I am a superb teacher."

LESSON 2

Counting Out Loud

Now that Menette understood the idea of one, I decided to teach her about *How Many*. But before that, I had to take care of some preliminaries.

"Dear Menette, do you know how to count?"

"Of course, I do," she said. "It's easy-peasy! Like, duh!"

She then counted all the way up to 20. She skipped "fifteen," but otherwise counted perfectly.

Teo the Trumpet began murmuring that there are no numbers larger than one because he is one and no one is larger, but I ignored him.

I said, "How did you learn to count so well?"

"I'll tell you my secret, Professor Ginsboo. I listened to adults counting, which they do all the time. They count how many cookies to give me and they count their money and they count their calories. Sometimes they read counting books to me and sometimes I watch the Count count on Sesame Street. Then I just memorized what I heard. And I love to show off my counting whenever a big person asks me. Want me to count again?"

"No, dear Menette, that won't be necessary." (I refrained from saying that it would be totally boring.) "It's good that you memorized those numbers. It's the only way to learn them and you are going to need them to learn some really interesting math."

Dear Reader, I hope that I have not shocked you. Although I have praised memorization and rote learning, I am a certified progressive educator. I studied at Teachers College, Columbia University. I know full well that the essence of math is not about memorizing and rote learning. Math is about big ideas. But I also know that sometimes you just have to "suck it up" (uncouth

5

expression) and memorize "stuff" (even uncouther). You cannot use your creativity to construct your phone number; you have to memorize it. You cannot count, "Five, blue, hippo, yogurt." No one will know what you are talking about if you say that there are hippo cookies (except perhaps hippos). So memorization is sometimes necessary, but not sufficient. It's not enough to count out loud by rote memory. You also have to understand what counting means and how you can use it.

Knowing how to count to 20 almost perfectly, and possessing remarkable insight into the history of her own learning, Menette was ready for the next lesson.

LESSON 3

How can one be one and also two?

"Dear Menette. Now that you can count to 20 and you understand one as a unit, you can learn some amazing math. I'm going to teach you *How Many*.

"Let's start in a simple fashion. You are, after all, a child. Look at Elroy the Elephant and Teo the Trumpet. How many are there altogether?"
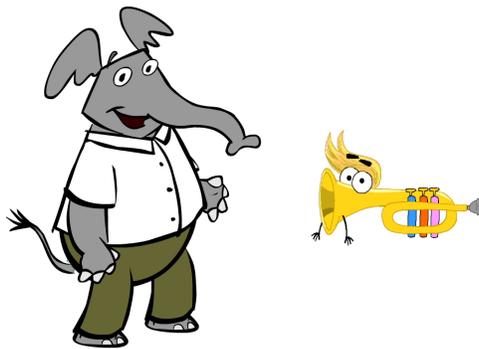
Menette said, of course, "Easy-peasy! Like, duh. There are two."

"But how do you know there are two? In math, you have to prove what you think is the right answer. Otherwise, how do you know if it's right?"

Menette then pointed to Elroy the Elephant and said "one," then to Teo the Trumpet and said "two." There are two altogether."

When they heard this, Elroy the Elephant jumped up and down, shaking the whole screen and bellowing as he said, "I am number one!" Teo the Trumpet stomped his feet and said that he always has to be number one; he is never number two in anything. Then he kicked Elroy the Elephant, but the elephant didn't feel a thing.

Menette tried to calm them down. She said, "I have an idea. I can make sure you are both one. Watch this. I'm going to count in a different order." She pointed to Teo the Trumpet and said, "one," whereupon he said, "Of course!" Then she pointed to Elroy the Elephant and said, "two," whereupon the elephant stomped his feet, almost crushing Teo the Trumpet, and said, "That's ridiculous. I am so big. I am number one."

6

Menette protested. "Stop acting like such babies. First I did Elroy the Elephant is one and Teo the Trumpet is two, and then I did Teo the Trumpet is one and Elroy the Elephant is two. You both were one. That's fair."

Elroy the Elephant said that *he* should always be "one" all the time because he is so big. But Teo the Trumpet argued that *he* should be "one" all the time because he is so great.

And then Katherine the Kazoo reappeared, crying loudly, and said that she was sad because nobody wanted to play with her and she wanted to be "one" also.

Menette started to cry. She said that she was trying to be fair but just didn't know what to do. She turned to me and said, "Professor Ginsboo. They both want to be one, but there are two altogether. This is your fault because you said everyone is one: one (and only one) Professor Ginsboo, one Menette, one Teo the Trumpet, one Katherine the Kazoo, one Elroy the Elephant, one motorcycle, and one banana."
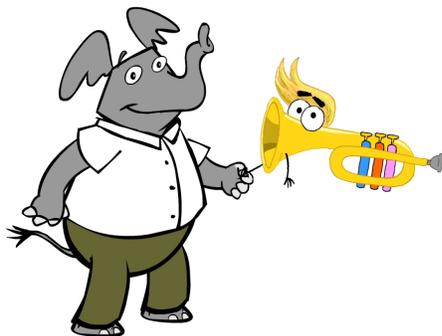
I decided that I would help. "Professor Ginsboo said that he would explain everything. Everyone pay attention. This is really hard. You are all right and you are all wrong. Got it?"

They didn't seem to but I went on. "First of all, you are all one. Each and every one of you is one. All for one and one for all. Here's a one, there's a one, everywhere a one, one.

"But. Watch this. Elroy the Elephant, say, 'I am one.'" He said it. "Teo the Trumpet, say, 'I am one.'" He did. "Now, Elroy the Elephant, hold hands with Teo the Trumpet."

This was not so easy because Elroy the Elephant had such big hands and Teo the Trumpet didn't want to hold hands with anyone. (I surmised that he was worried that his hands are small.) But finally they succeeded, and when each hand was holding the other, Elroy the Elephant and Teo the Trumpet sang out, "We are two!" I could see that they did not intend to do it, but when holding hands could not help themselves. They sang it a second time, "We are two!" They sang, "We are two!" two times.

"Professor Ginsboo is very proud of you," I said. "Now you understand. Elroy the Elephant, you are 'one' and Teo the Trumpet, you are 'one.' Neither one of you is two. Both of you together are two, even though each of you alone is one. Two is one and one; and one and one are two.

"Now Katherine the Kazoo, it's your turn."

Katherine the Kazoo went over to join the others. Elroy the Elephant said he is one, and Teo the Trumpet said he is one, and Katherine the Kazoo said she is one. And then when holding hands, they sang all together, "We are three! We are three! We are three!" That's right, three times.
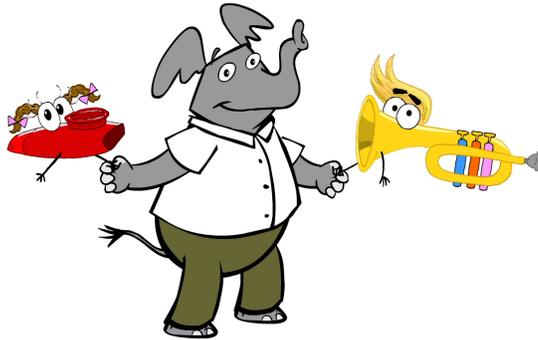
Suddenly down swooped the motorcycle. You guessed it. She was also "one," and at the end they were "four" altogether.

I then decided to deliver my big bombshell. "Listen up. Professor Ginsboo is going to tell you something shocking—like totally. No one ever counts correctly. Well, hardly anybody (but Professor Ginsboo) counts the right way. Let me show you. Here are some frogs.

"When most people count, they do this. 'You are one, and you are two, and you are three. So there are three altogether.' The last part is right: there are three frogs, but the rest of it is wrong. Yes, this pink frog—Feeble Phoebe—is one. But this purple frog is not two. That is not his name. It is Fast Freddy and he is one frog. And then when people point to the next frog, they say 'three.' But her name is not three. It is Fearless Frances, who can catch a fly twenty feet away." Number words are not names. They tell you how many.

"So here is the right way to count these frogs:

 "First, Feeble Phoebe says 'I am one' because she is one frog.

"Second, here are Feeble Phoebe and Fast Freddy. Each of them is one frog. But they hold hands and say 'We are two.'

"Professor Ginsboo is getting tired. Menette, can you figure out how to count all of them now?"

Before Menette could answer, the frogs lined up again, with Fearless Frances on the left and Feeble Phoebe on the right and Fast Freddy in the middle. Fearless Frances said, "I'm one," and then Fast Freddy said, I'm one," and Feeble Phoebe said, "I'm one."

Then Fearless Frances and Fast Freddy held hands and said, "We are two" and after that Fearless Frances and Fast Freddy and Feeble Phoebe held hands and said, "We are three!!!!"

I was very pleased with my frog demonstration and was positive that Menette had learned everything she needed to know about how many. So I asked her if she had any questions.

"Professor Ginsboo, that was a very good lesson. But I have a question, what do you do if you are counting something that doesn't have hands, like bowling balls?"

"Dear Menette, I need to think about that…"
Dear Reader, you are dismissed.