

Rudi Aksim
Box 86
Carp Ontario Canada K0A1L0
613-839-2990
rudi@aksim.org

Calibrating the Microscope

The cart with the eight microscopes on it made a soft jingling sound as Gary rolled them into the room on a Monday night in the old High School of Commerce. Some minutes before he had said, "I'll just be a moment," and had run out of the classroom in which teachers were giving demonstrations as part of an instructional techniques course. Gary was puffing and was looking flushed and middle-aged as he picked up one of the microscopes.

"First thing," he said, "Everyone's gotta know that each of these babies costs \$800.00. You drop one of these babies and you owe me *eight hundred dollars*." With that he moved around the room and set microscopes at eight desks and most of us moved so that we were relatively close to, but not in any danger of knocking over, one of the microscopes.

The lesson began. "This lesson is about calibrating the microscope. We're going to use these slides here—he held up a small piece of glass—to calibrate these microscopes. By the way, each of these slides is worth \$25.00. If you break one of these you owe me *twenty-five* dollars. The easiest way to break the slide is

to put it in the microscope like this—he demonstrated something on a microscope at the front of the room which none of us could see—and crank the barrel down. So don't do that. Start with your barrel at the bottom and then back it off."

"O.K. We're going to calibrate now. Put in your slides." Those of us who were not completely intimidated by this point moved up to a microscope. Some particularly brave members of our group—all experienced teachers taking a course in teaching adults—actually went up to Gary to get the slides he had warned us about. We installed our slides. None broke immediately.

"O.K. I've set up the microscope so you can just look down it. If you don't know what you're doing it can be a bit tricky. So look down your microscope. You'll see some lines.

They look like this—||, he drew on the board— and you can line them up with the scale you can see on the slide. It looks like this: | | | | | | | | | | —again he wrote on the board—you see?" Apparently there were some who did not see, for he walked quickly from microscope to microscope and twiddled the knobs and pointed down the barrel in a couple of cases.

"O.K. Now, you see, you can read these numbers off, like **1**—he wrote on the board—and they fit in this formula." He wrote down what looked to me like a really long formula, which I don't remember. The woman sitting beside me said,

"I could never do this kind of thing in school." "It's simple. Just line up the slides and read off the numbers, and plug them into this simple formula." The room in which this was happening had three 4 by 8 blackboard panels. Gary wrote the formula at the left of the left-hand panel, under the ||, the

| | | | | | | | | | ¹, and the **1** that were already written there and began to do

calculations. While he stopped every now and then and, without turning to face us, said something emphatic but unintelligible and we could imagine from the force and speed of his writing that little bits of chalk were showering the front of the room, he did not stop writing and murmuring to himself until he reached the middle of the right-hand board. Then, Gary turned to us with a flourish. He had written a large **35** on the board and punctuated it with a big chalk • which he delivered with a snap of his wrist. "And *that's* calibration," he said.

We sat dumbfounded for some minutes. Since no one else was ready to speak, I asked—although clearly it was not expected that any questions would be required—"Gary, why do I have to know this?" Actually, he had not told us either what we were to learn from this demonstration or why he had chosen it. "It's on the Grade 11 science curriculum," he said. "I'm not in Grade 11," I said, to which he replied, "Any competent microbiologist knows this." "Ah, Gary, I don't really

want to be a microbiologist, you know," I ventured although it was clear from his even ruddier complexion that he was getting angry.

"Gary," someone asked, "what is calibration, anyway?" "Well look," he said, "when you look down a microscope things are real small and it's had to tell how big they really are. Calibration lets you do that." "But what's the stuff with the formula?" "O.K.," he said, really angry now, "Forget the formula. Look at me. I'm about six feet tall. Lie me down on the floor and it would take about 3 1/2 of me to measure the whole length of this classroom. So this floor is about 3 1/2 Garys long. That's calibration."

"That would be a pretty good way to start your talk, if you want to teach us about this," one of the other teachers said and I wondered what might happened if his regular class in the high school had ever forced him to give this kind of explanation.

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