

Teachers to Learn From

These two teachers make learning come alive for their students.

By Edward Humes

Rod Ziolkowski

There's almost always a hodgepodge group of kids hanging out in Rod Ziolkowski's lab, building robots or writing computer programs or trying to figure out why their force-and-distance equations for the water-balloon catapult Ziolkowski built from Home Depot scraps keep coming up 30 metres short.

The kids loved that one. Seven teams had to calculate how far their balloons would theoretically travel, draw a chalk target for Ziolkowski to stand in, then fire their water missiles across the school yard. An A went to any group accurate enough to soak their physics teacher.

One day, Ziolkowski shows his honours physics class a strange-looking model. It has a flat wooden base about one foot long, anchoring three vertical metal rods of varying lengths, from less than a foot to about two feet tall, each topped by a small, rounded block of wood.

"If I shake this back and forth," he asks the class, "what will happen?" By now the students in honors physics know a Mr. Z trick question when they hear one, and they hesitate to blurt out the obvious answer. Mr. Z gives each thin metal rod a slight push with a finger, one at a time, making them sway slightly, so the class can see they are all flexible. "If you shake it, they'll all move," several students finally volunteer.

"Well, let's see," the teacher says, and he begins to shake the model back and forth, very fast. Only the short rod sways. He stops and switches to a long slow motion and immediately the long rod moves as the others stand still. Then he strikes a motion somewhere in between: the medium rod moves in synch while the other two remain motionless.

"Come up and try it," he says, and they do, kids with a cool new toy, fascinated and perplexed, then quick to grasp this visual demonstration of the dry discussion of resonance and frequency they read last night in their textbooks.

The model illustrates a host of principles and equations the class will use over the next few weeks, explaining everything from how wind can make a suspension bridge collapse (one very cool video), to why green light and red light combine — in apparent contradiction of everything they've been taught in the past — to make pure yellow.

Ziolkowski could have just given them the technical explanation of light waves and electromagnetic disturbances and resonance and the natural frequency of objects. He could have had them memorize the right equations and they could have passed a test on wave theory just as handily.

But long after those equations are forgotten and the exact wording of the underlying principles grows hazy, they will remember those magic metal trees and understand, viscerally, how one tiny piece of the universe ticks.

Dave Bohannon

Dave Bohannon, a history teacher revered and feared by students for 20 years, is not there to entertain and cajole, but to lay down the rules for his classroom, which he says are enforced without mercy and based "on the shocking notion that kids who come to school learn more than kids who don't."

For example, students' incessant habit of neglecting to bring textbooks to class is dealt with in this way: Bohannon obligingly lets them go to their lockers to fetch the books, but when they return, they find a blank paper on their desktop and an assignment to write a 200-word essay on how much history their lockers were able to learn from the textbook.

Today, Bohannon is wearing a white T-shirt emblazoned with the image of a bald eagle chomping on the head of Osama bin Laden and captioned THE EAGLE'S FURIOUS. The class is discussing the recent terrorist attacks, and the kids are full of questions about the coming war.

After a while, Bohannon brings it back to what they're studying: the founding of their country and the war for independence when, he tells them, many of these same questions, or ones very much like them, were first faced in America.

Why, he wants to know, were the founders so adamant about placing the military under civilian control. He waits a beat, sees no hands, and answers his own question. "Because they didn't want the generals to decide when to go to war. Why? Because generals are trained to fight. That war had to be a political decision, not a military one."

"Let me explain it this way. Let's say a kindergarten girl rushes in here and kicks Ryan and then laughs about it. What do you do? You grab her and yell stop — and she starts screaming. If you let her go, she knows she can get away with it. So what do you do? You have the power, but can you use it? Who do you want to decide?"

A collective *ohhh* can be heard in the room, the small telling example making viscerally clear to every kid in the room with a little brother or sister just how exasperating the choices facing a country might prove to be. This is Dave Bohannon's gift for teaching history: seamlessly spanning the centuries in a single question. Though he is traditional, strict, and curmudgeonly, he remains a perennial favourite of the students, who admire and respect him.

"It's strange," Jennifer says, shaking her long, beaded braids, "but you can relax in Mr. Bohannon's class *because* he is so strict. You would think it would be the opposite, because, you know, we're teenagers and we like to get away with everything we can. But when kids know they can't, then you just relax and learn. I think that's really why everyone likes his class so much."

(Adapted with permission from School of Dreams — see our review on page 3)