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Introduction

This year's class of *Advanced Methods of Teaching Science* included Jamie Wilcox, who teaches Biology I, Chemistry I and Physical Science at Potts Camp High School, and Pete Nelson, who teaches Biology I and Biology II at Simmons High School in Hollandale.

The articles included in this volume exemplify thought and insight by the authors and are very enjoyable reading.

I would like to commend these students for the dedication they have shown to the teaching profession and I wish them continued success in their future teaching endeavors.

Pete Nelson

Finding a Balance

Like most first year teachers, I have struggled with many obstacles in my first months of teaching. My formal training as a teacher was certainly extensive and upon leaving summer school I felt confident enough in my abilities as a teacher. However, I soon found out (but not without warning) that no matter how much training new teachers are put through, there is nothing that can prepare them for teaching. Within weeks of starting my job as a Biology instructor I found myself unable to think of the fundamental rules given to science teachers. "Teaching inquiry" and presenting fun and hands-on activities soon took a back seat to silent work and notes as I attempted to get control over my students enough to take attendance. It wasn't long before I found myself stuck in a mundane cycle of notes, worksheets, and tests.

Like most teachers, most of my obstacles have been classroom management problems. Early on, I often found myself blaming my students for problems in the class. Why not? I had called many of their parents the first week of school to check in, I had given them clear rules to follow as well as swift and appropriate consequences for those who broke them. It was clear to me that my job was done. I had laid the framework for my class and had enforced rules as I said I would. Why was I seeing such minimal changes in their behavior? Given that I knew the answer to my problem from previous coursework, it took me much longer than I would like to admit to accept it. It seemed as though some of my problems were not necessarily central to what my students were doing, but what they were being asked to do. Of course not all of my problems were connected to the structure of my lesson (some students simply devote their time to disruption) but I soon realized that if I was asking the students to take notes and do worksheets while remaining silent, they had no choice but to generate disruptions. Such was the case with Neshekia.

From the moment Neshekia set foot in my classroom, her apathy towards my class was readily apparent. She rarely was in class on time, and spent a significant portion of the class period sleeping or scowling at me after being woken up to learn. My first

attempt at solving her problem was to move her to the back of the room thinking that the energy of the students in the middle would draw her back in (this was based on several suggestions from colleagues). Unfortunately, this tactic backfired and Neshekia capitalized on her new anonymity by becoming even more of a problem in the classroom. My problems with Neshekia continued steadily until I gave her class their first opportunity to break from the norm. I allowed them to make their own groups and assigned the groups to create a song, rap, poem, or skit depicting the process of photosynthesis. This was a big step for me, but at the time I had nearly worked myself into the ground with lecture and was in need of a break. Luckily, it turned out my class was also in need of a break.

Given the chance to work together and create something of their own, my class thrived. There were some problems with the group project, but several of the presentations were much better than I had expected and the students finally had something other than notes to occupy their time. Even more surprising to me, was the change in Neshekia's behavior. Rather than sit in the back, she took an active role in her group's project and became the informal MC for the presentations. The group project had finally given her a chance to do something she enjoyed, but more importantly, it forced me to reevaluate my initial judgments on Neshekia and others like her.

Since the project I have attempted to incorporate as many alternative or "hands on" activities as possible. However, with that in mind, it is impossible for learning to *always* be enjoyable. I now spend more time planning alternative methods of presentation, but incorporating activities into my lesson plans has not completely jarred my personal belief that concise notes and lecture play an important role in learning. Neshekia helped me remember that falling into mundane routines, whether in or out of the classroom, poses a threat to healthy progress. There are benefits to both formal lecture and informal group work but relying solely on one or the other raises the potential for exhaustion on both sides of the teacher/student relationship.

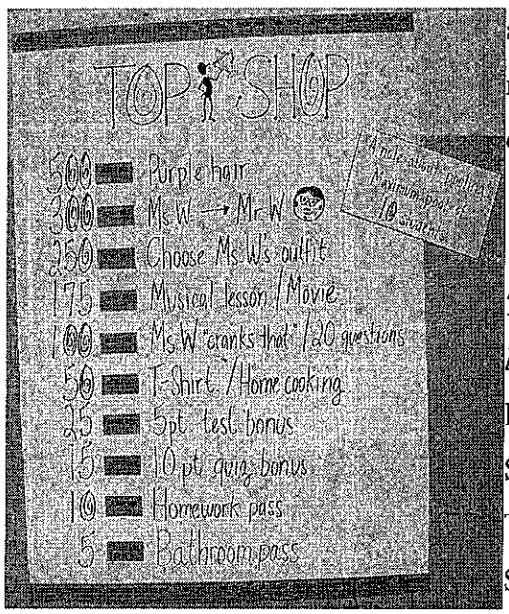
"Inquiry and Jellyfish"

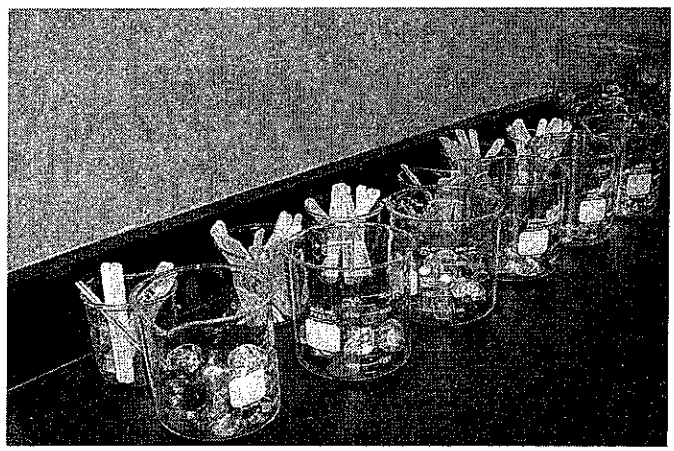
Jamie Wilcox
Fall 2007

To say that these past few months rank among the most taxing and reflective periods of my life feels to me to be as gross an understatement of their impact as describing Avogadro's contribution to chemistry as a "really big number." My teaching career by far hasn't had the marked brilliance of that certain scientist's dozen, but in its own way has been as much an application of science as that which I have aimed to teach: a progression that begins with a vision—an educated guess—followed by a series of trials and errors, sometimes culminating in an affirmation of the hypothesis and at other times calling for a revision, a redirection, an adjustment. The brief time spent at this small, rural high school in northern Mississippi has allowed me to become familiar not only with the methods of inquiry innate to the traditional sciences but also to the dynamic science of teaching. What follows are the highlights of my semester-long inquiry of (in)effective science instruction.

Bribing them (to learn).

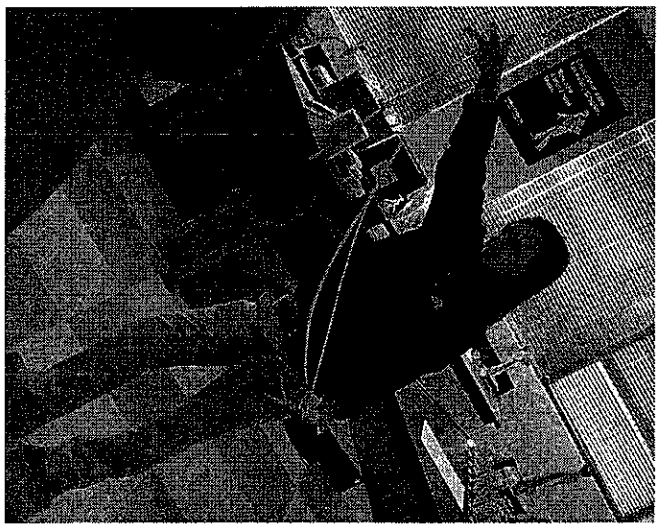
If the class goes through the period without anyone receiving a consequence, I add an "atom" to their class jar. When the jar is full, they get the infamous FreeDay. Tickets are earned with insightful comments, questions, or participation. The rewards range from a homework pass to Ms. W teaching in drag. No one has redeemed any yet, but they sure seem to get a kick out of the concept, notably the distant carrot of my dying my hair purple.



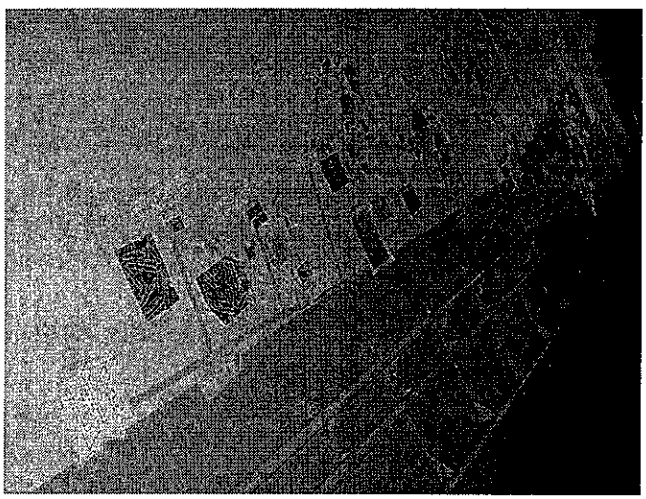


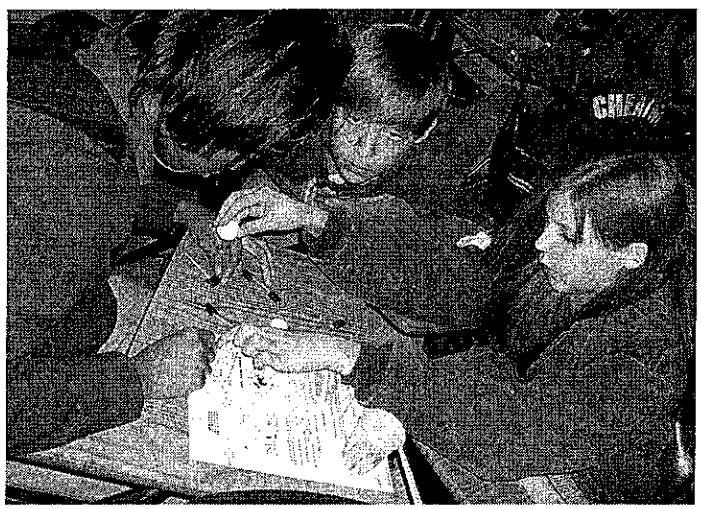
Tricking them (to learn).

Physical science: Students made Teenage Brain Substitute (gak) and explored its physical properties; modeled the Kinetic Molecular Theory and changes of state through human-particle motion (not pictured).



Biology: Students found pictures of organisms, classified them, and wrote taxon characteristics in the form of organism autobiographies; made candy models of glucose molecules; performed plays on the biogeochemical cycles (not pictured).





Chemistry: Students were assigned a selection of elements to research and display on index cards as a wall-sized periodic table, color coded according to elemental division; performed flame tests on metallic compounds; created and performed raps on the periodic trends of atomic and ionic radii, electronegativity, electron affinity, and ionization energy.

Lately I've felt as though I, age five, were encountering my first jellyfish, sea-wrecked on the shore of Buttonwoods Beach, Rhode Island. Armed with a meager stick and mustered determination, I poked at the moribund, biological Jello. Growing bolder, I abandoned the arm's length distance and hunkered close to it, reaching out with a tentative finger to prod at the small, gelatinous tentacles. The sting from the nematocyst was very tolerable, and so years later, when I found myself swimming in the Atlantic in a cloud of red cnidaria, I didn't immediately head for shore. Instead, stubbornly, I tested my tolerance until I couldn't tell the difference between numbness and searing pain. Strange as it may seem that teaching high school science reminds me of the morbid curiosity and blind-sighted independence that brought me a quarter way to death, to me the memory seems a near perfect analogue. That same yearning for discovery and challenge brought me here and keeps me here, despite the daily, multitudinous tinges. What I hope is the saving difference between then and now is, of course, my stint with teaching doesn't end with a bottle of ammonia and temporary paralysis.