A young man with dark and rumpled hair, his necktie loosened just a bit, walks slowly to the front of Michael Childers' classroom. He presents his teacher with a sheet of paper, politely asking for help on a physics problem that has momentarily stumped him. As the two begin to talk it through, the student's frustration gradually gives way to a spark of recognition. "I have to solve for $v$," he says, almost to himself, as if he has discovered something he hadn't noticed before.

"Yes, yes, keep that thought going," his teacher says with genuine enthusiasm. "You're on it—you're on it!"

This is a snapshot of learning physics in Mr. Childers' classroom at Webb School in Knoxville. There is an enormous periodic table on the wall facing the door. There are physics articles and brochures on the bulletin board, including a Knoxville News Sentinel story about Physics Professor Marianne Breinig and teaching the physics of football. And there is a contagious energy from the man in front, a 1993 UT physics graduate, who sees teaching physics not so much as a job, but as a way to make a positive mark on the world. He also happens to be the son of physicist Robert Childers, who spent more than three decades teaching physics on the faculty at UT. Yet it wasn't his father's work that drew him to the sciences.

"In fact," Mr. Childers says, "I probably avoided physics for a long time." At age 18, he says, "I wanted to blaze my own trail, do my own thing. I wanted to do something different. My father is a theoretical physicist, so there weren't gadgets lying around. It was just a slide rule and paper. That's what physics was to me; I had no clue as to what it was."

The younger Childers began college as a music major, but then tried computer science, accounting, and math.

"When I was a math major, I had to take a lab science," he says. "So I thought, 'I'll take physics.' And when I (did), just to fulfill the lab requirement, I thought, 'This is the most beautiful subject I've ever seen. This is what I want to do with my life.' I always credit physics for teaching me how to think."

Even though he decided on physics, teaching wasn't part of the picture—at least not at first.

"I thought I would do research," he says. "I can remember talking to my father and we were contemplating experimental versus theoretical physics and what I thought I might like better."

It was the inspiration from a young woman named Angela that added the educational component to Mr. Childers' career.

"I was dating a girl—who I ended up marrying—and she was in social work," he explains. "I felt like she was making such a difference in people's lives. I thought I'd really like to do something where I could do physics, because that's so much fun, and also have some hope of impacting somebody's life. That's how I happened upon teaching."

So while finishing his bachelor's degree in physics, Mr. Childers also earned his teaching certification in both math and physics. But while he always got a job teaching math, he says, he would have to wait at least a year in any school before he could teach physics. After 12 years in the public school system, his wife told him there was a physics-only teaching position opening at Webb, a private school in Knoxville. He is now in his second year there. He teaches courses in advanced placement and conceptual physics. He also sponsors the physics and engineering club, which gives him an opportunity to talk about science outside the classroom.

"Some kids just hear the word physics and it's frightening," he explains. "You don't want to make physics into something that it's not, but you want to present it in a way that doesn't scare off somebody." The key, he says, is to convince students that "you don't have to be a genius in math to have success at some level in physics. It's not an untouchable subject for anybody."

When asked how he would advise a student who might one day want to teach physics, his initial response is simple: "Find a grader." But in more serious tones, he adds, "You need a lot of energy. You need to have that social work heart to help somebody along. I think that's the only advice I would give somebody."

**The Artisan Scientist**

Unlike his son, Robert Childers ended up in physics partly because of a little fatherly advice. He had intended to major in philosophy and minor in art at Howard Payne College (now university) in his native Texas. But on a visit home, he says his father was reading the newspaper and announced, "I just don't see any job ads for philosophers."

As an undergraduate, Dr. Childers already had a passion for math, and he knew someone from Berkeley was coming to teach physics at
Howard Payne. So he decided to give physics a try. He went on to graduate in 1960 with a bachelor’s degree in physics and math and a minor in art.

When it came to choosing a graduate program, however, he says he had one caveat: no equipment.

“I like ideas,” he says. “I would be an utter disaster as an experimentalist. Give me a pencil.”

So when Vanderbilt University offered him a fellowship that meant no lab instruction, he accepted. But, he says, he also knew that once the fellowship ended, he might very well end up with an assistantship, showing undergraduates the finer points of experimentation.

“The money was for three years,” he says. “Normally it takes five years to get a Ph.D. I doubled up on courses; I finished in three years.”

After two years as a post-doc at Argonne National Laboratory, Dr. Childers came to the physics department in 1965 as an assistant professor, retiring in 2001. He started out teaching graduate courses and some engineering physics classes. He went on to teach physics for pre-med majors for several years, and physics for architects as part of a post-retirement agreement with the university. The biggest difference between the latter two groups, he says, is that “pre-med students study. Architecture students hope.”

That sense of humor came in handy when he would find mystifying problems in physics textbooks. He describes one that showed a picture of a patient with ropes wrapped around his broken leg and instructed students to calculate the proper torque. He once asked a physical therapist about the need for this and she explained that in reality you simply pull on the ropes until the patient asks you to stop.

“I am a teacher, really. I love to teach anything I know enough about to teach.”

“I decided that if I were ever in that sort of situation and a nurse came in with a calculator to figure out the torque, I would say, ‘Don’t touch the ropes; just go away,’” Dr. Childers says. “I like to focus on the intuitive of physics, rather than the formal,” he explains.

“Intuition is more reliable, to me, than mathematical detail.”

Intuition and creativity also drive his avocation: painting. (As his son says, “I’m bias; but he’s a fantastic artist.”) For awhile Dr. Childers took on portrait commissions for an art gallery, and he spent the summer of 1982 at the Art Students League of New York. Giving up the pay he normally earned teaching summer courses was a difficult decision to make, but it turned out to be a good one. New York was where he really learned to paint, he says. “You take classes until you learn what you need to learn, in your opinion.”

He also lucked out when fellow Physics Professor Ed Hart mentioned that he had a cousin in Queens with a spare room she was willing to rent for $275 a month. She even picked him up at the airport, holding a sign that read, “Is that you, Bob?”

Since his retirement, Dr. Childers has had more time to devote to artistic pursuits, sometimes even offering lessons to other painters. “I am a teacher, really,” he says. “I love to teach anything I know enough about to teach.”

It makes sense, then, that two of his children ended up in the academic world as well (daughter Cindy teaches computer science at Pellissippi State). However, Dr. Childers says that he advised them to do whatever they wanted to do professionally. “I love physics,” he says, but, “I did not suggest that (Michael) go into physics. I didn’t care what he did, so long as he liked it.”

And every once in awhile, he says, he still gets to be the professor when one of the kids calls to ask for some help with a math problem. “I get a kick out of that.”

“Research shows that a child who has teachers with the knowledge and skills needed to teach mathematics and science effectively in precollege grades is more likely to be able to close the achievement gaps that he or she experiences and be prepared as an individual for success in work and life.”

—From America’s Pressing Challenge—Building a Stronger Foundation
(A companion to Science and Engineering Indicators 2006)