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Away from the ivory tower: Real challenges teaching high school physics in an urban environment

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For more than 20 years, I have been a physicist and a science educator, primarily at the college level. My research is on understanding and improving the learning of science, from elementary school science through quantum physics. Since 1999 I have been Professor in the School of Education and the Department of Physics and Program Director of Science Education at City College of New York. In that time I have had the privilege of working with hundreds of K-12 students, with over a thousand science teachers in and around New York City, and with even more college science students who are graduates of the city school system. To improve my ability to work with all these groups, I spent my sabbatical as a full time high school physics teacher in a public high school in New York City. For me, it was where the rubber meets the road. In this presentation, I will share experiences as an instructor and researcher from the perspectives of college physics instructor, science teacher educator, and high school teacher. With few exceptions, teachers are taught physics one way, are taught to teach it another, are put in a system where neither approach works, and have their students assessed in a way that promotes instructional strategies at odds with how students learn. I will share both challenges I encountered and what I learned about what works in this environment.