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Michael Guarraia

8th Grade Science Teacher

Arbutus Middle School

Arbutus, Maryland

Working as a senior engineer for Lockheed Martin, Michael Guarraia made the decision to leave engineering and obtain his masters in teaching. Upon graduation, he was placed at the lowest performing middle school in the district. Within three years, Guarraia received several accolades from internal and external sources, including recognition at two Baltimore County Public Schools award ceremonies and being named an Amgen Fellow by the National Science Teachers Association.

Guarraia's next step was becoming department chair at nearby Arbutus Middle School. He worked tirelessly to improve the existing antiquated science pedagogy. By identifying professional development opportunities for the teachers he supervises, Guarraia was able to improve instruction across the science department. In two years, student performance increased 1.2%, an impressive achievement when compared to other departments.

Michelle P. Feeney, Principal at Arbutus Middle School, asserts "Mr. Guarraia is a focused and high-energy teacher who engages his students through his love and enthusiasm for science. He works closely with the members of this department to ensure that they feel supported and that they incorporate best practices in science instruction for their students. He is an outstanding teacher leader."

In addition to his role as chair, Guarraia manages two engineering focused programs at the school. The first is an afterschool program called the Kinetic Sculpture Race Team, in which students design, build, and race a human-powered vehicle that must also be a work of art. Guarraia manages this program to motivate students to pursue engineering careers and to inspire learning by doing.

The second program Guarraia manages is designed for students that typically underperform in a traditional academic setting. The goal is to spark student interest in the skilled trades, such as carpentry. Guarraia recognizes that while college is a wonderful opportunity for many students, it is not the only pathway to a rewarding and successful career. The program uses an overarching project to integrate core academic subjects in an engaging manner. The latest student project involved constructing a full scale medieval siege weapon designed to hurl a ten-pound projectile 1,000 feet.

Guarraia summarizes his teaching philosophy in four words: kids learn by doing. He works tirelessly to make sure students are actively engaged in constructing meaning from bell to bell. To start, Guarraia identifies a measurable and achievable learning objective and lays out a path for students to achieve success. His lesson plans focus on the 5E model: engagement, exploration, explanation, extension, and evaluation.

In the classroom, Guarraia inspires engagement by presenting a problem that students must solve collaboratively during an experiment. For example, students may be given three pipe cleaners and asked to create a model for each of the three types of galaxies. These exercises require students to be actively engaged in the content in a meaningful and enjoyable manner.

Guarraia creates opportunities for exploration by providing students more control in the learning process, allowing them to make meaningful connections to the content. After the exploration stage, students are better able to understand and provide their own explanation.

Next, in order to provide a more authentic context for new knowledge, students must understand and appreciate its application. Extension provides an opportunity for students to consider how new knowledge fits into the world around them. Finally, students must be evaluated on this new knowledge.

The 5E model gets students excited about science as a potential career choice. Guarraia recognizes that science is a field that is constantly evolving, requires selfless collaboration, and can result in tremendous benefits to both humanity and the natural world.

Guarraia maintains a positive attitude toward his students, interacting with them as an interested adult who listens to their academic and social needs. His classroom climate is positive and supportive while maintaining high levels of academic expectations.