

# ***Student Success***

*Title 1 students improve achievement in science*

## **Many different students at many different levels: One integrated technology solution**

The diverse student populations that comprise American schools today create unique opportunities and challenges for student learning, and Norcross High School, in Gwinnett County, Georgia mirrors this in many ways.

Its enrollment is made up of almost equal percentages of African American, Caucasian and Hispanic students who come from a variety of economic backgrounds, including nearly 60% eligible for free and reduced lunch. There is also diversity in academic ability, with students taking courses ranging from Advanced Placement (AP\*) to College Prep (CP) levels.

To meet the needs of their diverse learners, they have found a science educational partner that is effective in helping all of their students learn science. Norcross High has chosen PASCO to be a part of its success for years, and its student outcomes keep improving.

Norcross High, a Title I school, outperforms the Georgia and Gwinnett County averages for passing the science portion of the state high school graduation test among first-time test takers. The scores are higher than those of any of the other five Title 1 high schools in the district. Overall graduation rates, especially for African American students, are also on the rise. Norcross High identifies incorporating technology into its lesson plans as the key to maintaining continuous progress in science achievement, and PASCO's probeware, and learning environments including the SPARK Science Learning System™, are at the heart of it.



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***~ Logan Toth***

## **Engaging students in the scientific process**

Logan Toth is a second-year science teacher at Norcross High. Her class schedule of CP chemistry and AP\* biology reflects the diversity at the school. "I teach both ends of the spectrum," she says. "It kind of keeps me on my toes. I don't deal with the same groups of students all day and you definitely have to work with those groups in completely different ways."

Prior to the 2009/10 school year, physics teachers had been successfully using PASCO's portable graphing datalogger, Xplorer GLX, and probes in their AP\* courses. Then Toth took up the challenge to try out PASCO's new portable graphing datalogger, the SPARK Science Learning System, in her chemistry and biology courses. The results were so good that SPARKs are now in use in many classrooms and courses.

While Toth teaches students at different academic levels, one thing they all have in common is an infusion of technology in their lives. Because of this, she believes "they just get it" when it comes to SPARK. And she's confident that all of her students benefit when using SPARK, regardless of their academic level or interest in science.

The biggest challenge Toth has faced in her CP class is getting students interested in lab activities. And yet, she saw a sudden change when they started using SPARK. "I had never seen any of the CP chemistry students more engaged than they were using the SPARKs. It's user-friendly, the kids grasp the technology so well and it was one of the first times that I actually saw those kids really get excited to do experiments and practice science in the classroom."

For her CP students, Toth believes that "seeing is believing," particularly as it relates to collecting data over time. "My students get the material a lot quicker when we do these labs with the SPARKs, especially when graphing is concerned. They can see as data is being collected, they can see graphs being created in real time and they're understanding patterns. It definitely has made them understand chemistry at a whole different level!"

Toth also sees a great advantage for her AP\* students using the technology. "The AP\* curriculum has been around for years and the labs have as well. The [measurement] technology we have at the school is becoming out of date so the students don't always get the results that they should. With the SPARKs it's nice because we can use the sensors and collect a lot more data than we can normally, so the kids can see their results and they understand a lot better."

The value of seeing data collection over time applies to her AP\* classes, too. "They're like a textbook," she says of the students, "They can memorize something and remember it. But it's different when you actually try to dig a little bit deeper and try to get them critically thinking. There are definitely concepts that they have taken away because they have seen data collection over time."

In her chemistry classes Toth uses PASCO's SPARKlabs, inquiry-based, interactive lab activities that incorporate science content, data collection and analysis and student assessment. In addition, they include prompts for students to answer questions, make predictions and analyze their results. For her biology classes she creates lab handouts and the students create the data runs and sampling methods on SPARK. She has used the units indoors and out with great success.

## Teacher friendly: Easy to learn and use

Toth acknowledges that taking on new technology in the classroom can be challenging. "It can be a little scary if you have a set of 30 SPARKs in your classroom. If they start to have problems and the kids are off task, what do you do?"

But a short workshop with a PASCO trainer and her school's technology coordinator was all she needed to relax. "After you do a lab you're not by any means daunted by the technology. It's so user-friendly. You see it at first and you think 'Oh my gosh, look at all the set-ups, all the probes, how I am going to get this thing to work?' But once you do a lab and you experience it, it's very easy!"

John DeCarvalho, Norcross High's technology coordinator and a veteran science teacher of 16 years, was impressed by the training the teachers received from PASCO. "I've been in dozens of these trainings and I thought that it was one of the best ones ... because as the coordinator I had everything I needed from PASCO. I was sent what to have ready and how to prepare, which made the whole process that much easier. And I was in touch with the trainer. He called me many times before he got here just to make sure that I had everything I needed."

DeCarvalho also appreciated PASCO's commitment to him as a customer demonstrated by regular check-ins to see if they were using the equipment or if they needed anything. "I thought that was great, and when we had extra money I didn't hesitate to order up another 30 SPARKs." But excellent customer support wasn't the only reason for getting more PASCO equipment: "I can guarantee you that if there wasn't a level of success demonstrated, we would never have gotten the additional SPARKs."

## Impacting Science Learning

At a time with increased focus on testing, Toth enjoys using SPARK to show students that science is about more than just memorization. "I think that kids kind of lose track, and teachers too, that science is a study and it's a process and it's experiments and questioning and things like that. The SPARKs have given me an upper hand in the classroom environment to let these kids know that science is fun and it can be engaging."

DeCarvalho also sees the value of the SPARK Science Learning System to their students understanding of science. "Between middle school and high school somehow they lose that love for science, and so to bring that to the high school and have the kids see that science is not just taking notes and watching PowerPoints and watching Bill Nye — that there's actual value in collecting data and analyzing it...to me it's worth a lot! And to see that kind of involvement, interaction and engagement at the CP level was worth all the money we spent on the SPARKs."

"It's beautiful to watch the kids using the SPARKs," says Toth, "because it's every science teacher's dream to see that natural inquiry go on and see all the students engaged and doing the lab and asking questions and looking ahead."

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## Improving science achievement

Schools receiving Title 1 funds face the challenge of improving academic achievement for their students. To ensure success, high quality instructional materials and scientifically based instructional strategies must be implemented. As your science education partner, PASCO will help you identify the right strategy to engage students in the learning process and improve student achievement.

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