

Chemistry Man

Pete O'Brien gets students working on "real science"

Pete O'Brien, the Upper School Chemistry teacher for the past six years, was a process engineer and lab manager for Kaiser Trentwood before deciding he'd be a lot happier in education. To hear him talk about his work, there's some good chemistry between Pete and Saint George's!

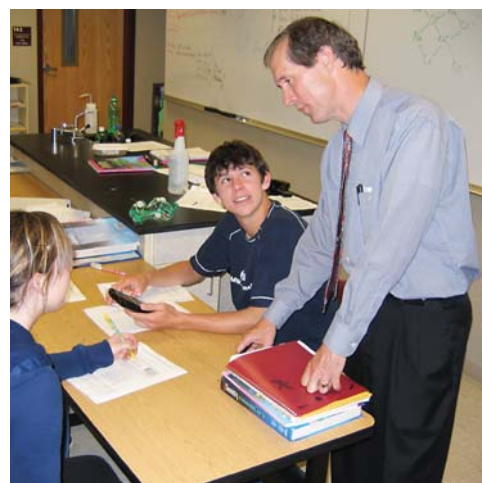
"I focus on chemistry, my area of expertise, and I don't have to teach out of my field, which is rare at a big school. Then we are given latitude to use the curriculum that we think is best. Pair these two things together and you end up with a good curriculum.

"Then add outstanding professional development opportunities that the school pays for. Last summer I spent five days with college chemistry teachers at Linfield College. Here's how that benefits the students: This year the science teachers were asked to identify the best elective to offer at Saint George's. The college professors that I spoke with said they want to see kids with a background in organic chemistry, since that's the class they use to weed out pre-med and pre-pharmacy students. So I'll be offering that as an elective starting this fall.

"When it comes to equipment, I've never had the school say "No," so I've got everything I need. Balances accurate to 1000th of a gram, spectrophotometers for

every small group, and every computer workstation has data-logging equipment and software that shows a real time, on-screen graph so you can watch the pressure or temperature change as it happens.

"The biggest thing though is small class sizes, so I can see that



Pete O'Brien talks with his class about a POGIL experiment

everyone is on task and getting the material. Small labs allow you to do "inquiry labs" where you give brief instructions so the students are solving a problem, instead of just following a detailed script. It's more like real science – not like baking a cake – and it's what the National Science Foundation says labs should be like. But it doesn't work with 30 kids in a lab.

"Take the lab we are doing today – "Heat of Solutions" – which has three pages of instructions in the book. I boil it down to seven lines of general directions and a few questions that they have to solve. They work in small groups to figure it out, not just demonstrate something. It's less structured, there are more questions in class, and the kids have more responsibility. It changes their thought process. And there is so much classroom discussion that I'm only talking half the time in a "lecture" class.

"These inquiry labs are what's called process-oriented, guided inquiry learning, or POGIL. This is what many colleges use, but very few high schools can do it. I've been using the college materials for some of my lessons. It makes the 10th graders stretch and works fine for AP Chemistry. The O Chem class will be 100% POGIL. The kids also seem to be learning – the average test score on these lessons was 90%."

Two chemistry students check the results of their experiment

