

CONSTANT COMMENT: KEEPING A DYNAMIC CURRICULUM ALIVE

Instructor in mathematics Joe Wolfson spent part of last summer doing what he and his colleagues have done almost every summer for the past 10 years—working, discussing and revising math problems, and writing commentary about them for the benefit of fellow teachers.

Exeter's math program is unusual in that it does not use standard textbooks except in statistics courses. Instead, each course uses a packet of word problems that the department has written and rewritten over the years, placing problems in a specific sequence that is the result of an annual collaborative editing process. "When we committed ourselves to creating our own materials more than 10 years ago, we wanted them to remain dynamic in the sense that they could and would change as our needs and thinking changed," says Department Chair Joyce Kemp. "We have remained faithful to this idea."

Every June, a volunteer editorial board of department members undertakes the task of incorporating into the course materials the suggestions colleagues have made as they have used the problems. "This might involve some reordering of problems so that the presentation is smoother, or perhaps rewording to make things clearer," says Kemp. "Sometimes we add new problems and delete those that don't seem to be working." Wolfson believes "it is a great advantage to have dynamic curricular material that is not tied to a publisher and which allows ample room for regular redesign." In addition to participating in this process, Wolfson has taken on maintaining a commentary on the problems that is available to his colleagues. In the Math 4 (calculus) commentary that is still in progress, for example, Wolfson's conversational prose offers insights and suggestions about approaching each problem and makes connections to other problems in the packet. "Joe is a very skillful writer and mathematician and his commentary is invaluable to all of us, but it is especially critical for anyone new to the program," says Kemp. "I don't know how we could begin to introduce a new teacher to teaching here without his support materials."

This is true in part because course packets do not contain introductions to concepts and principles or sample problems and

equations; all pertinent material is in the text of the problems themselves, which are presented in a way that asks students to see patterns and connections before naming concepts. They are designed to reflect what Wolfson calls "the spiraling nature of mathematical knowledge," where no skill or concept is isolated or abandoned, but rather built upon. The department's approach is an alternative to the traditional textbook presentation of topics as discrete, unrelated units with associated rules and formulas.

"Word problems demand that the students be proficient readers and that they make decisions about what to do with the information they have been given," says Wolfson, a believer in the intellectual value of facing the unknown. "We want to develop people who are problem solvers, who aren't afraid to deal with novel situations." Ideally, the students, not the teacher or a textbook, become the source of their own mathematical knowledge.

For many math teachers, one of the great pleasures of teaching at Exeter is the fact that each class has a different "chemistry" in which the nature of

each student's previous math experience comes into play, so that every iteration of a problem is unique. Teachers typically assign eight problems a night. In the following class, students put their solutions on the board and discuss them with their classmates, in essence teaching each other; the teacher helps to forge connections between ideas and make sure the skills being developed are mathematically sound.

Just as learning math in a Harkness class is a collaborative process, so is the teaching of math at Exeter. Math teachers often cite the opportunity to explore their subject with outstanding colleagues, many of whom have chosen to teach here instead of at the college level, as one of the most satisfying aspects of their jobs. Wolfson's commentary is part of that equation. Although not all department members use it, Wolfson sees it as something that reflects the whole department's work. "As I get feedback, I adjust what I've written, and I have redo things every year as problems get moved around," he says, "but I have enjoyed doing this for my own sake." ●



Joe Wolfson, instructor in mathematics