## Focus on Mathematics Summer Institutes, 2006
http://www.focusonmath.org/FOM/programs/summer/

Three one-week Summer Institute sessions were offered to the **Focus on Mathematics** school district partners: Arlington, Chelsea, Lawrence, Waltham, and Watertown. 42 teachers from our five districts participated. This includes, Anne Cook, a teacher from Lawrence who facilitated the very successful institute "Fostering Geometric Thinking."

Descriptions of the different institutes are described below. All sessions are being hosted by Waltham, at the Kennedy Middle School. FoM is particularly grateful to Eileen Herlihy, District Leader, for her hard work, and to the Waltham administration for the much needed support to make this possible.

## Fostering Geometric Thinking

This institute, aimed at strengthening teachers' understanding of geometry, will serve to help teachers advance geometric thinking in their classrooms. Designed for upper elementary, middle, and high school teachers, Fostering Geometric Thinking will provide hands-on investigation of rich mathematical problems in geometry and measurement. Teachers will be given the opportunity to explore and solve mathematics problems, discuss different solution approaches, and analyze artifacts of student thinking. A framework for conceptualizing important geometric ideas, Geometric Habits of Mind or G-HoMs, will provide teachers with a language to describe geometric thinking and a lens through which to view and analyze student work.

Three major content areas in geometry will be explored: Geometric Properties, Transformations, and Measurement.

Session 1 (July 10 – 14, 2006)

Facilitator: Anne Cook (Lawrence Public Schools)

## Focus On Calculus

Or, "Everything You Wanted to Know About Calculus, But Were Afraid to Ask"
No prior experience with calculus is necessary.

This institute is designed to introduce calculus to teachers from a variety of perspectives.

Preparation for Calculus: What are the key concepts that are presumed of students as they begin the calculus sequence, such as linearity and periodicity?
Conceptual: What is calculus? We will strip away the technical details, and examine the core concepts of calculus in familiar contexts such as motion and the growth of investments.

Historical: Where did calculus come from? We will look at some history behind the development of calculus.

Scientific: How is calculus used in science? We will examine why virtually every science and engineering major in college is required to take calculus.

Educational: Why should teachers know about calculus if they are not teaching it? We will discuss how the K-12 curriculum can help prepare students to take calculus at the university level.

Practical: This won't be a test-prep course, but by the end of the institute participants should be able to answer most kinds of calculus questions that appear in teacher certification exams like the MTEL.

Session 2 (August 14 – 18, 2006)

Facilitator: Ken Levasseur (UMass Lowell)

## Trajectories in Algebra

Algebra is more than just a high school course sequence! What are the "habits of mind" that lead to success in developing algebraic proficiency across the grades? We will spend this week tracing core ideas from early elementary searches for patterns to results and applications in high school. Through a focus on interactive problem solving, we will emphasize three major themes: representation, structure, and extension. This institute is suitable for teachers of all grade levels.

Session 2 (August 14 – 18, 2006)

Facilitators: Al Cuoco, Bowen Kerins, Sarah Sword (EDC)