You are cordially invited to attend the
MSU Mathematics Education Colloquium

Wednesday, February 20, 2013
3:30 – 5 p.m., 252 Erickson Hall, MSU

Presented by:

Amy Ellis
University
of
Wisconsin-Madison

Building Learning Trajectories From A Foundation of Quantitative Reasoning

A recent focus of mathematics education research has been the development of learning trajectories characterizing the learning over time of a mathematical topic. Work from our research project SPARQ (Supporting Proof in Algebra through Reasoning with Quantities) has emphasized developing hypothetical learning trajectories for middle school students' understanding of linear, quadratic, and exponential functions and then engaging in teaching experiments to validate and revise those trajectories. I will report on my research team's processes of retrospective analysis to refine a learning trajectory for exponential functions; through this process, we identified multiple conceptual shifts students experienced as they created multiplicative rates of change. I will share data on students' emerging conceptions and identify challenges in negotiating hypothetical and actual learning trajectories when analyzing student data.

Amy Ellis is an associate professor of mathematics education at the University of Wisconsin-Madison. She studies students' learning, focusing on algebraic reasoning, generalization, and proof. Dr. Ellis received her Ph.D. from the joint program at the University of California, San Diego and the San Diego State University. She also holds a master's degree in mathematics. Prior to her appointment at U.W. Madison, she spent a number of years teaching middle school and high school mathematics in California. In her current position she enjoys working with pre-service and in-service mathematics teachers at the 6-12 level. Amy's research is supported by multiple NSF and IES-funded projects, which include work on examining how classroom environments influence students' mathematical generalizations and proof practices, investigating how reasoning with quantities supports students' understanding of functions, and exploring how thinking with examples can foster proof development. Amy is currently the co-principal investigator for *The Role of Examples in Learning to Prove*, an NSF-funded project aimed at exploring the relationship between example use, conjecturing, and proving. She is also the principal investigator for SPARQ, an NSF Early CAREER award supporting the investigation of the role that quantitative reasoning plays in students' development of function understanding and proof production. Amy received the Early Career Publication Award from the SIG-RME division of the American Education Research Association, and she has published her research in journals such as the *Journal for Research in Mathematics Education*, the *Journal of the Learning Sciences*, the *Journal of Mathematical Behavior*, and *Cognition and Instruction*. Amy has also co-authored three books for the NCTM Essential Understanding Series on ratio and proportions, mathematical reasoning, and proof.

The Program in Mathematics Education sponsors this event.