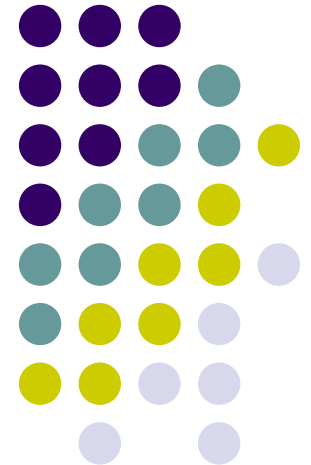


Using PBL to Teach Teachers

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MSERC's Mission



- To provide professional development to in-service teachers-math and science, middle and high school.
 - Strengthen content understanding
 - Model good classroom practice

The educational system context for teachers



- Classes are inclusive-students with a variety of aptitudes, attitudes
- Students learn best if they are engaged in constructing their own understanding
- Science and Math standards that specify the “big ideas”
- High stakes testing at intervals that requires teachers “cover” lots of material

Quantitative Literacy & Scientific Inquiry: MATH 589, SCEN 545



- Co-taught with Jon Manon, math colleague at MSERC
- Learning Goals: Three big ideas
 - Are two populations the same or different on a single variable?
 - Are two variables related within a single population?
 - How do scientists use evidence to construct explanations, make inferences (what is nature of science)?

Quantitative Literacy & Scientific Inquiry: MATH 589, SCEN 545



- Pedagogical methods/goals
 - Model for teachers how inquiry can transform the classroom experience with PBL
 - Help develop reflective practitioners. Challenge teachers to ask the question: What are my students thinking?
 - How can we collect evidence?
 - What do I do with that information?

Quantitative Literacy & Scientific Inquiry: MATH 589, SCEN 545



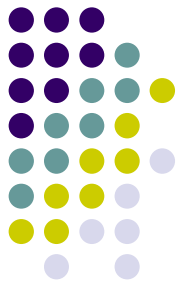
- Pilot offering in spring 2006, to be repeated summer 2007
- Intended for middle school mathematics teachers and science teachers
- Engage teachers in a discussion of the math and science beyond the levels that they would expect for their students



PBL Problems

- John Snow and the London Cholera Epidemic of 1854
 - Nature of Science
- Hilda's Research on the Finches of the Galapagos Islands
 - Nature of Science
 - Statistical description and analysis of a large database from different species and the same species on different islands.
- Egyptian Skulls—5000 years of change
 - Are they different? What does it mean?

John Snow & the London Cholera Epidemic of 1854



- Evidence, explanation and inference
- Sources: handouts, text material & web readings



John Snow & the London Cholera Epidemic of 1854



- Stage 1: Read all about it
- Stage 2: What were the major theories for the cause? What is evidence? How did John Snow use his theory to predict?
- Stage 3: Testing the prediction





John Snow—did it work?

- As an example of college level classroom inquiry-B (engaging story, lots of depth & resources; fun for the instructor)
- As an exposition of the nature of science-A (clear line between evidence, explanation and prediction; evidence vs inference)
- As a classroom example—D (teachers remarked that it was “way too difficult for their students”)
- Use of end-of stage formative assessments—B (What are my students thinking?)