Teaching Math
Everything I know

Pedagogy
Nothing works.

• Pacing the course
  “Covering” vs. discovering
  Review / View / Preview
  When to move on
  The “parallel paths” system
  “Lagging” the homework

• Heterogeneous classes
  Alliance with the best students
  Support for the weakest
  Diversity of levels and techniques

• Cooperative groups
  To go over homework
  To solve big problems
  As general policy

• Class discussion
  The elevator: too easy / too hard / just right
  No putdowns
  How to handle wrong answers
    Postpone revelation
    Poker face (sometimes)
    Students call on students
  Praise participation not correctness
  Ask students to restate things
  Make “mistakes”
  Get responses from all students
    (votes, writing, hand signals, …)
  “Talk to your neighbors.”
  New problems, not same
  Move around
  Nonverbal techniques
  Don’t answer questions they don’t have
    Seed with questions and discussion
  When appropriate, lecture!
    Fanfare vs. silence

• Writing
  Exploratory: routine
  Finished product:
    Reports
    Problem sets
    Projects
    Posters, other media

• Assessment
  Homework
  Quizzes
    Participation quiz
    Homework quiz
  Cumulative tests
  Notebooks
  Test corrections / “recycles”
Curriculum
This is not 1900.

• Skills vs. concepts
  Balance!

• Problem-solving
  Reversal
  Flexibility
  Open-ended questions

• Tool-based learning
  Manipulatives
  Technology
    Graphing, spreadsheets
    Interactive geometry, statistics
    CAS

• Connections
  Within math
  To science
  To life, art, culture, literature
  Using the Web

• NCTM, Common Core Standards
  Less emphasis on
    Simplifying
    Memorized algorithms
  More emphasis on
    Reasoning and sense-making
    Applications
    Communication
    Discourse

Professional Development
You are as important as your students.

• Reasonable expectations
  Attainable goals
  Being willing to not attain them

• Constant forward motion
  Too fast: exhaustion, depression
  Too slow: rut, depression
  Just right: excitement, inspiration

• Focus
  Curriculum: one course at a time
  Pedagogy: one technique at a time

• Working with colleagues
  Buddy
  Mentor
  Collaborator

• Keep on learning
  Teachers’ mathematics

• Beyond the classroom
  Discussion of department policies
  Staying in touch with other schools
  The Internet
    Escape from the Textbook! network
  Conferences