Undergraduate Research at Valparaiso University

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Valpo Context

• Exclusively undergraduate dept
• Many double majors
  – Meteorology, Physics
  – Mechanical, Civil engineering
  – Education
  – Arts & Languages
  – Computer Science
  – Social Sciences
Research Program Focus

- Primarily first and second year students
- Inclusive for skill level and major interest
- Process, not product, oriented
  - Read, Conjecture, Prove, Write, Present
- Pre-REU focus
- Faculty interest areas
- Teams
Characteristics of Good Problems

• Engaging Problem
  – Easy to state
  – Relevant to students

• Easy to generate data for conjectures

• Easily stage-able sequence of work

• Computing component

• Access to readable literature
Current Problems

• Generalized Segregation Game
• Variations on the Piles of Pebbles
• Analysis of Course Evaluations
• Modeling Infectious Diseases
• Radio Colorings of Graphs
Other Research Assistants

- USDA projections
- Automated Tutoring Systems
- RFID vehicle transmissions
Recruiting Logistics

• Faculty
  – Temperament and timing

• Current students
  – Personal contact
  – Colloquium events

• First year students
  – Letter of invitation

• Balancing the teams
Scheduling Logistics

- Year long commitment
- 1 S/U credit per semester
  - (no teaching load credit)
- 1-2 hours of meetings plus additional work each week
Seven week cycles

- Understand the problem – confusion
- Build conjectures – frustration
- Proving theorems – excitement
- Sharing results – satisfaction
Presentations

- Technical report
- Undergraduate colloquium
- Celebration of Undergraduate Scholarship
- Conference presentation
- Paper publication