What is POGIL?
- Teams of 3-5 students use processes with roles, reports, etc.
- Scripted activities to guide inquiry, construct knowledge, & achieve learning objectives.
- Used & validated for ~20 years in other areas (chem, bio, etc).
- Improves content mastery, learning skills, attitude, retention.

Why does POGIL work?
Learning increases when students:
- collaborate in teams
- combine content & process
- construct knowledge
- connect ideas & representations
- receive prompt, regular feedback
- reflect on process & progress
- follow learning cycles (see below)

How do POGIL activities work?
- roles: manager, recorder, speaker, technician, ...
- models: data, figure, code, ...
- questions to guide inquiry
  - directed, convergent, divergent
  - learning cycle(s)

Example Activity (Simplified)
Model: Consider a 2-player game:
- a. A chooses a number (0...100).
- b. B guesses a number.
- c. A replies “hi”, “low”, “you win”.
- d. Guess & respond until B wins.

Critical Thinking Questions
1. Play the game several times. How could rules be clarified?
2. List & describe 3-5 strategies for B to guess numbers.
3. Compare with other teams. (recognize tradeoffs)
4. Rank strategies by how:
   - i. quickly they win
   - ii. easy they are to explain
5. How are rankings related?
6. For each strategy, find the largest (worst) # of guesses? the average # of guesses?
7. Compare with other teams. (see different patterns)
8. Find worst & average counts if range is 0...1000? 0...N?
9. Compare with other teams. (see patterns as count grows)

Goal 1: Develop, refine, validate, & disseminate CS-POGIL materials.
Goal 2: Raise awareness of POGIL & foster a CS-POGIL community.
Year 1: Train & Develop
- workshops & kickoff meetings
- pilot, revise, & share activities
Year 2: Revise & Validate
- expand project team
- revise, assess, & share activities
- presentations & workshops
Year 3: Disseminate
- revise, assess, & share activities
- presentations & workshops
- explore new ideas & directions

Colleagues & Collaborators
- CS: Matt Lang, John Doughtery, Heidi Ellis, Stoney Jackson, Lisa Olivieri, Mario Nakazawa, Sriram Mohan, Brad Richards
- CS (high school): Tammy Pirmann
- India: Sandhya Kode, Bhanusree Kodura, Jyotsna Cherukuri, et al
- chemistry: Dan Libby, Carl Salter, Tricia Shepherd, Rick Moog
- students: Tim Gee, Erica Wenzel, Laurainne Ojo-Ohikuare, Mike Walsh, Averill Morash

Activities Developed (partial list)
- DS&A: searching, sorting, queues, stacks, lists, hashing, algorithm analysis, NDFAs, halting
- Soft Eng: life cycles, scheduling, risk, task tracking, version control
- AI: decision trees, fuzzy logic, genetic algorithms, neural nets, natural language processing
- Misc: unit testing, exceptions, inheritance, code reading, Python

Dissemination
- conference posters & talks; workshops: 6 conference, 6 other (ASEE, CCSC, NCIIA, SIGCSE, T4E)

Emerging Directions
- tools: Google Docs, Moodle
- patterns and design canvas to analyze & construct activities
- POGIL in high school CS
- POGIL in southern India

References & Resources
- POGIL Project http://pogil.org (guides, activities, workshops)