Introducing Spreadsheets across the Curriculum
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NSF DUE-0126500
(5/15/02 – 4/30/03)
Modules for geological -
Mathematical problem solving.
Proof of concept.

NSF DUE-0442629
(7/05 – 6/08)
Spreadsheets across the Curriculum.
Full Development.
A WORLD AWASH IN NUMBERS!

Where I’m coming from.

QL: A habit of mind in which one engages numbers in everyday context.

Math phobia
Math anxiety
Math avoidance
The process begins, not with a list of content items, but with setting goals by answering the question, “What do I want my students to be able to do on their own when they are done with my class?”, rather than the question, “What do I want my students to know in this subject?”

What do I want my students to be able to do on their own when they are done with my class?

Solve problems.

Polya.

Our knowledge about any subject consists of information and of know-how. If you have genuine bona fide experience of mathematical work on any level, elementary or advanced, there will be no doubt in your mind that, in mathematics, know-how is much more important than mere possession of information.

What is know-how in mathematics? The ability to solve problems -- not merely routine problems but problems requiring some degree of independence, judgment, originality, creativity. (p. vii-viii)

Polya’s heuristic –
1. Understanding the problem.
2. Designing a plan.
3. Carrying out the plan.
4. Looking back.

A problem is a ‘great’ problem if it is very difficult, it is just a little difficult. Yet some degree of difficulty belongs to the very notion of a problem: where there is no difficulty, there is no problem. (p. 117)

My Course: Computational Geology

Purpose: To solve (geologic) problems (not exercises) with quantitative content.

- 15-25 students.
- Late Juniors, early Seniors.
- Capstone for required math for the major (one year of calculus).
- Non lecture
  - Each class: A “How to Solve It” session
  - “Just in time teaching”
  - Target: Leave with plan to build a spreadsheet to solve problem
  - Homework: work through module on course Website
  - Hand in selected “End-of-module questions”
- Term project: Groups make and present a SS module.
Rules/Tips for Modules

Teach the math, not the context.*

Remember, 13-16 slides. Target for 15.

Include one or more slides that preview the module.

Pose the problem.

Build the spreadsheet in successive slides.

End with “end-of-module questions.”

Create metadata for cataloging and access.
Rules/Tips for Modules

Expect that whatever you think will be in one module will take 3-4 modules.

Do not expect that your students will have mastered unit conversions.

Repetition is a good thing.

Tip from his students → Small Steps, All Steps.
(Reinforce the problem solving process!)