Integrating Labs into Lableess Classes

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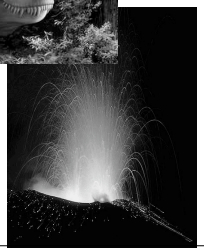
Constraints

- Time
- Attitude
- Facilities
  - Classroom
  - Elsewhere on campus
  - Virtual or actual field trips
    - Jewelry stores
    - Landscaping companies



Succeeded in:

- Intro courses (50 - 80 students)
- Cross-listed grads & undergrads (10 - 20 students)
- Courses for non-majors (80 - 120 students)

Time

- M-W-F class for 50 minutes
  - 30 minute activity for intro/general course
  - 40 - 45 minute activity for upper level course
- T-TH class for 100 minutes
  - 45 minute activity for intro/general course
    - On-campus field trips?
    - May lose students if you go too far
  - 90 minute activity for upper level course
    - Off-campus field trips?

Facilities: Want more than you have?

- Other campus locations
  - Library computer labs
  - Unused labs in other departments
  - Outside for a day?
- Costs time to move somewhere else!
- Make due
  - Dishpans instead of sinks?
  - Bring in laptops?

Attitude

- Students didn't sign up for a lab
- Get students accustomed to in-class activities, exercises the first day
  - "*Do it early, and do it often.*" --H. Macdonald
- Lab becomes extended in-class exercise

Decide & Inform

- Decide what you want to do
- Inform your students
  - What skills, concepts do you want your students to learn?
  - How will you grade them?
  - What will they hand in, when?

Just do it!*

- Run through the *entire* lab yourself beforehand
- Time factor:
  - Intro students = you * 3
  - Upper level students = you * 1.5

**Alone. First.*

Preparation: Get students accustomed to in-class activities

- Anything other than chalk-and-talk
- Small group discussions
- Think-pair-share
- Demos
- Pass around samples
- Sorting, classification exercises

Preparation: The "Lab"

- Hand it out previous class period
- Students will:
  - Lose it
  - Not read it
  - Not bring requested supplies
- You will
  - Briefly explain it
  - Bring needed supplies

The "Lab"

- Hands off as much as possible
- Enlist TAs or senior students if you need help
- "Steer" students, but
  - Let them goof
  - Let them teach each other

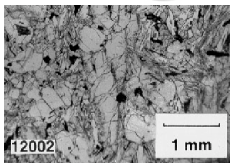
Aftermath

- ALWAYS finish in time to discuss activity
- Repeat goals to students
- Get immediate feed-back
  - Don't wait 'until next period
  - Will probably be oral
  - Hand out written evaluations
- Begin subsequent class with lab discussion
  - Remind students of goals, techniques, results
  - Collect written evaluations

Examples of "Labs"

- Crystal fractionation with Legos
- Measuring building volume using pace length
- Making geologic maps of planetary surfaces

More "Labs"



- Measuring viscosity of shampoo & yield strength of pudding
- Rock & mineral ID
- Thin sections of lunar rocks

Integrating "Labs"

- Use your research
- Time carefully
- Prepare students
- Practice alone first
- Debrief students--at least twice