



# Reaching Students as a Graduate TA

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# Basic Responsibilities as a TA

- Official scope of job is limited
  - Lecture 1-2 times/week, office hours, grading
- Amount of time with students makes personal connections difficult
  - How many student names do you remember?

# What is the Goal of Recitation?

- Lecture paints “broad strokes”
  - Fundamental principles, equations, etc.
  - Typically few examples
- Recitation works with a “finer brush”
  - Fill in missed details
  - Correct misperceptions
  - More examples to build problem solving skills

# Problems with Recitation

- Limited time with students
  - 1 hour/week in Fall or Spring semesters
  - 3 hours/week in Summer session
- Giving appropriate attention to *all* students
  - Time-intensive (need hand holding through problem)
  - Confident, but clueless students (request little time, but need much)

# Taking Inventory

- “I don’t even know how to start this problem.”
  - One of most infuriating things in teaching
- These students need to build problem solving *skills* before they can start solving problems.

# Analyze the Problem

- Read question carefully
  - Look for *explicit* information, e.g.  $q=13\text{ nC}$  says what the charge is.
  - Look for *implicit* information, e.g. "A capacitor is charged..." implies the two plates have equal and opposite charges
  - Make a chart of knowns and unknowns
  - Draw pictures, if helpful
- What does the problem ask for?
  - Can I identify what I need to solve for?

# Assemble Relevant Equations

- Make a list of possible equations
  - Based on analysis of problem and question
  - Be as inclusive as possible; don't leave any possibilities out
- *Direct* link between known quantities and desired result?
- *Indirect* link between known quantities and desired result?
  - e.g. Know potential, get electric field, calculate field energy density

# Start Calculating

- Choose a path to try first and begin
- Include units
  - Assures you know when conversions need to be made
  - Difficult to explain to students importance of this part



# “Sanity Check”

- Does final answer have units I expected?
  - Wrong units = definitely wrong answer
  - Right units = maybe right answer
- Is my result reasonable? (Order of magnitude)
  - Takes experience with problems to determine
  - Look at similar worked problems to compare

# Repeat as Necessary

- Wrong answer?
  - Was any information missed previously?
  - e.g. tried problem using forces, too difficult. Reread question and noticed more information about energy. Try energy!
- Encourage incorrectness
  - Forces reevaluation of understanding; gain experience

# Responses?

- “Inventory” idea? Thoughts? Concerns?
- How do you identify & help students in need?
- Thank you!