Answering Student Questions

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Rutgers DELTA-P Seminar  September 29, 2016
answering students’ questions well

why does it matter?

• helps students learn!
• student evaluations
  • most important attribute is that you care and have respect for students
  • fairness+helpfulness not “easyness”
• critical skill for seminars, outreach, etc.
answering students’ questions well

Prof... is the first instructor I've had at Rutgers that never made the students feel dumb.

His patience was astonishing and the answers to some of our questions which were sometimes irrelevant or far too complex for the care of the lesson were comprehensible and extremely satisfying.

... cares about the quality of answer to in class questions and pays special attention to answers that may confuse or were just off the mark by a little and needed followup instruction.
24 years ago: a town-hall debate
Doppler shift: observed wavelength vs time

Doppler shift: \[ z = \frac{v}{c} = \frac{\lambda_{\text{obs}} - \lambda_{\text{rest}}}{\lambda_{\text{rest}}} \]

A galaxy is moving away from us at a constant speed. Which of the following shows a plot of the observed wavelength (\( \lambda_{\text{obs}} \)) of a spectral line from the galaxy (with laboratory wavelength \( \lambda_{\text{rest}} \)) as a function of time?

- **A**
  - \( \lambda_{\text{obs}} \) vs time
  - \( \lambda_{\text{rest}} \) vs time

- **B**
  - \( \lambda_{\text{rest}} \) vs time
  - \( \lambda_{\text{obs}} \) vs time

- **C**
  - \( \lambda_{\text{rest}} \) vs time
  - \( \lambda_{\text{obs}} \) vs time

- **D**
  - \( \lambda_{\text{rest}} \) vs time
  - \( \lambda_{\text{obs}} \) vs time

- **E**
  - \( \lambda_{\text{rest}} \) vs time
  - \( \lambda_{\text{obs}} \) vs time
Doppler shift: observed wavelength vs time

Review Question 3
Which plot below best represents the case for a spectral line as a function of time, for a distant galaxy?

(A)  
(B)  
(C)  
(D)  
(E)  

\[ z = \frac{v}{c} = \frac{\lambda_{\text{obs}} - \lambda_{\text{rest}}}{\lambda_{\text{rest}}} \]
answering students’ questions well

- why does it matter?
- student evaluations
  - most important attribute is that you care and have respect for students
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• asking a question in class is one of the most courageous things our students do; respect and reward that courage always!
best practices: make time for questions

• try to avoid: “Any questions?” “Is that clear?” “Got it?” “Ok?”
• students are perceptive! they can tell when you really don’t want questions and just want to move on to the next topic!
• “At this point, I’m sure there are questions, so please ask.”
  “This is a confusing topic, so I budgeted time for questions.”

• if it suits your teaching style, encourage questions anytime
• pay attention to raised hands (look at your students!); tell students to get your attention however they can
• if you do this, don’t postpone answering the question; that will discourage others

• in general, time spent clarifying old material is typically more useful to students than moving on to new material
best practices: understand & clarify

- take time to understand the question
- repeat the question/paraphrase the question (this helps you, the questioner, and the whole class)
- take a few seconds; think about and formulate a response

- answer for the questioner and for the whole class

- give validation & encouragement to the questioner
  - “great question!” “that’s an interesting perspective” “ah, yes, this is a confusing point, I’m glad you asked about it”
  - promotes a positive and active learning environment
  - be sincere!

- check back with the questioner to see if you’ve answered
best practices: confusion

• if you don’t know the answer to a question, say so!
• “I’ll look that up and get back to you (and the class)”
  “Why don’t you research that for next time?”
• make sure to follow up

• often, the questioner will be confused and the question won’t really make sense, e.g., wrong terminology. (but make sure!)
• avoid these words: “no” “wrong” “stupid” “idiot”...
• try to latch on to some correct part of what was asked and gently mold it into a better question. then answer that.

• follow up individually (after class or via email) with students whose questions show lack of basic understanding
answering students’ questions well

• best practices
• budget time for questions; encourage them
• repeat/paraphrase/understand the question
• answer it for the student and for the class
• pause, take a few seconds before answering
• validation: “that’s a good/interesting question”
• be honest if you don’t know
• correct a misinformed questioner gently
• connect with the student asking the question
discussion by example
any questions?

uh, I mean...

what are your questions?
3. A snowboarder starts from rest at the top of three ramps with the same height but different slopes as shown. Ignoring friction, for which ramp will the snowboarder have the greatest speed at the bottom?

(A) Ramp 1
(B) Ramp 2
(C) Ramp 3
(D) The snowboarder will exit each ramp with the same speed
(E) It’s impossible to tell without knowing the mass of the snowboarder

write down questions a student might have