

## Preparing a seminar chalk talk

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If you've given a mathematics chalk talk before, you're familiar with the challenges. But if you haven't, you'll find that chalk talks look easier to give than they are. A common misconception in undergraduate seminars is that learning the material is sufficient preparation: that if you know the material it will be easy to just come to class and present it. But presenting without prior thought about *how* to present is challenging: you need to simultaneously decide what words to say, what words to write, where on the board to write them (especially when you run out of space), and how to juggle speaking and writing. Simultaneously you also have to decide which information to include and omit and how to order it, monitor time and decide how to adjust if you're running over, monitor audience understanding and decide how to adapt if they seem confused, etc.

Doing these all simultaneously is hard, so you can make your life much easier by moving as much of these to the preparation stage as possible. I suggest doing the following to prepare for your chalk talk:

1. Learn the content
2. Decide what to focus on: your classmates can read the text so there's no reason for you to just duplicate the text. Instead, your presentation should ideally help your classmates to understand the text. That means
  - a. Identify what's hard or subtle about the content, and decide how you can help your classmates understand this material
  - b. Identify why your classmates should care about this material. How does it relate to other material in the course? You may not know this yourself, but your professor can help: ask.
  - c. Once you've decided what to focus on, decide what content, if any, can be omitted or presented in less detail to make room for (a) and (b) above. (check with your professor)
3. Once you know what content you want to include and what you want to emphasize, choose a structure for the content. (e.g., sometimes stating the main result first helps classmates see the relevance of preliminaries, but sometimes that's not an option.)
4. Plan out what you will write on the boards and where you will write it. You can do this by drawing the boards on a piece of paper. Typically, about 5-7 lines fit legibly on a board (you can go into a classroom to test this with your handwriting). Once you have your plan of the boards, look at it from the point of view of a student who is confused and trying to figure out what you're doing and why you're doing it, or from the point of view of a student who stopped listening to you briefly to think and needs to look at the boards to catch back up. Revise your board plan as needed so the boards contain enough to be helpful for these students.
5. Practice your presentation in the classroom with someone who can give you good feedback. I am happy to do so—you can email me to arrange a time.
6. Leave enough time before your talk so you can revise based on how the practice goes.

I'm happy to meet to help you plan your talk or to give feedback on a practice (or both). You can email your communication instructor, Malcah Efron, to arrange a time: [meffron@math.mit.edu](mailto:meffron@math.mit.edu)

A seminar is a group of mathematicians helping each other learn a body of material. Have fun!