

How to plan a class session

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So (to use a scenario from personal experience), having put it off until the last minute, you're faced with 75 minutes of class time tomorrow. How should you go about planning that time? Here are some thoughts.

1. To be clear: **You need to make a plan, every time.** Even if you think the subject matter of a particular day's class is easy, I have personally witnessed very capable instructors make nontrivial errors and get "lost in the weeds" on topics like drawing parabolas, taking square roots and absolute values, and factoring, and certainly I've done things like that myself. If you present or make up examples, they should be worked out ahead of time; if you're going to have students do problems, make sure you know how to do them yourself. "Winging it" doesn't work!
2. One good place to start is to ask yourself: **What do you want students to be able to do when class is over?** What is the homework that you'll assign later? What are the main ideas from the class that might show up on an exam? In particular, it's a good idea to assign the homework from the day's material ahead of time, and then actually look at the problems enough to figure out what the main ideas are that your students will actually use.

3. Similarly, you'll want to ask: **What's important in the textbook, and what isn't?** And actually, the latter question is more important: Most textbook sections will have material that you will only want to cover lightly, or even omit completely. (For help with this question in Math 8, see the list of "possible topics for the final".)

In my view, this job of "curation" is a highly underrated part of teaching. Your students are faced with a mass of information in textbooks, videos, etc., and it's your job to point out which portion of that information are the most important ones to learn first. (Of course, if this is your first time teaching a course, you first have to figure out what's important yourself!)

4. Perhaps the most important question is: **What will your students do in class to practice the goals you want them to be able to achieve?** Or in other words: **How will you spend your time?** I suggest a mix of:

- *Lecture:* You talk. (And, I hope, look for questions, answer them, and adjust what you're saying based on how your students respond.)
- *Exercises:* Students do relatively straightforward problems by themselves, and then check answers with their neighbors. (The "check with your neighbor" idea is called "pair-share".)
- *Group work:* Students solve longer, more involved, or more conceptual problems in groups of 3 or 4.

When planning your class time, I suggest you keep the following principles in mind.

- *Active learning:* Different topics and different instructors will use different mixes of “you talk” and “they do”, but if you find yourself talking for 75 minutes, that is may not be the best use of your students’ time. Remember how you asked yourself what you want your students to be able to do when they leave? Why not have them practice doing that in class, instead of waiting until they get home (or possibly never)?

As a warning, active learning does require more thinking about people skills, more planning, and more improvisation than just talking. However, I urge you to try it; it works, and you’ll find that you and your students have more fun, to boot.

- *Try setting a timetable:* For example, when I plan a Calculus I class, I’ll make a rough schedule like: (30 min) Go over homework due today (5 min) Mini-review lecture (15 min) Group work part I (15 min) Group work part II (10 min) Present answers on board, wrap-up discussion.
- *Everything takes longer than you think:* It’s amazing how quickly “How on earth will I fill 75 minutes?” turns into “Oh no, we’re only halfway through the section and there’s only 5 minutes left!” Try to make a plan with parts that you can cut when (not if) time runs short; for example, in the above Calculus I plan, I might make the group work part II something that could be cut for time. And did I mention the importance of curation?
- *Conway’s rule:* My Ph.D. advisor, John H. Conway, is a legendary lecturer, and his advice to me was, “Plan what you want to say, and cut it in half. Repeat. Every time you cut it in half, it gets better.” (Of course, when I asked him, “When do you stop?” he answered “Never — at my advanced age, I can talk forever about nothing, and it’s absolutely *wonderful*.”)