

Common Splash teaching pitfalls (and how to avoid them)

Too much material in too little time

It can be difficult to get a good sense of how long it takes to teach a certain topic. Don't feel badly if you struggle with this at first; it takes experience and practice. However, there are some precautions you can take to make sure your class goes well despite your lacking sense of how much time you should budget for it.

What's the worst that can happen? Imagine you've told students in your class description that you'll show them, from electricity and magnetism, the nature of light as an electromagnetic wave. You plan for the wave solutions to Maxwell's equations to be the punchline at the end of a two-hour class. But to your surprise, when the two hours are up, you've only gotten through half your material, and your students are sad because you haven't talked about light! Or, you might realize this impending problem half an hour before the end of your class, and rush through the remainder of your material. This isn't good either, because your students won't understand any of it, and you may as well have kept going at the same pace.

How to avoid the pitfall:

- Practice your class, or a few parts of it, in front of a friend to get a sense of how long things *really* take. You might find that a concept for which you budgeted only five minutes actually takes you 15 minutes to explain! Remember to budget time for student questions.
- Don't plan to reveal the big punchline in the last ten minutes of your class! Instead, plan to achieve your central goal halfway or three quarters of the way through the class, and then add extra cool things to talk about (possible examples in this case: circularly polarized waves, diffraction...) for the remainder of your lesson plan. If you run out of time for these extra things, it'll be much less of a big deal than running out of time for your central goal. By planning this way, you'll eliminate much of the possibility that class ends before students get what they came for.

Too little material in too much time

This is the opposite pitfall: Oops, it's 11:40, class ends at noon and you've already finished your lecture! What gives?

Why might it happen?

- You may have simply not planned enough material to fill the time of your class
 - You may have rushed through your material too fast.
- Some teachers start rushing when they become nervous.

What to do if it happens:

- *Don't* let your students out early. If you really can't think of anything else to do with them, try playing a game like Hangman on the blackboard.

How to avoid the pitfall:

- Incorporate flexibility into your lesson plan: an extra half hour of content you could cover, or topics for students to discuss, in case your default lesson doesn't fill the time. If you really can't think of anything, try searching for YouTube videos related to your topic.
- Do you typically talk while simultaneously writing on the board? Don't do this! Talk, then pause to turn around and write, then start talking again when you turn to face your class. Those pauses seem a lot shorter to your students, who are also trying to listen to you, and copy down notes at the same time, and who haven't seen your material before! Additionally, your students can't hear you as well when you're not facing them, and you make it impossible for those who may be hard of hearing to lipread. Simply deciding not to write and talk at the same time can add as much as 20 minutes to the length of your lecture, *and* help students understand it better.

Forgetting essential prerequisites

Uh-oh: you've just gotten halfway through your teaching and realized you need students to know (for example) how to solve physics problems using free-body diagrams, what a derivative is, or that $e^{i\pi} = -1$... and your students haven't seen this before. Unfortunately, none of these are things your students are likely to understand if you try to explain them on the fly: they're concepts that take time for students to absorb and accept.

How to avoid the pitfall: Unfortunately, this one really takes advance planning to avoid. *Carefully think through each step of your class, before it comes time for students to sign up, and write down what concepts your students will need to have seen before.* If they are concepts that students won't be able to completely understand and apply after only a short amount of exposure, you need to include them as prerequisites. An example math prerequisite might be 'ability to compute simple derivatives and integrals', or on a lower level, 'familiarity with the concept of a function and simple polynomial functions (quadratics and cubics).'

Powerpoint syndrome

Do you have a powerpoint full of words and bullets? Are there more than three complete sentences in your powerpoint? Do you need to look at it constantly while lecturing? If so, you may be suffering from Powerpoint Syndrome. A lecture that is read off of a Powerpoint is not very engaging.

The cure: First plan your lecture *entirely without Powerpoint*. Transfer the information from your powerpoint to your personal notes, which you can refer to periodically while speaking. Plan to write some of it on the board during your class, and/or include some of it on a handout for the students. Practice in front of a mirror, a friend, an empty room, or your peers at an ESP teacher training to get comfortable. *Then* add the powerpoint back in, and this time, *include mostly pictures and diagrams, and only a minimum amount of words.*