

So You Want to Give a Math Talk...

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1. Purpose

Before presenting or even planning a talk, you should seriously and honestly consider your goals in presenting the talk. Here are some typical goals in the minds of presenters:

- a. Show the audience how clever you are.
- b. Convey to the audience an enthusiasm for your topic.
- c. Get through as much content as time will permit.
- d. Stall for time—maybe the time will elapse before you get to the really hard part that you don't understand anyway.

I will share some experiences of one of my favourite teachers, H.S.M. Coxeter, an excellent mathematician and teacher who always presented material based on its intrinsic appeal and interest.



2. Topic

What will you talk about? Ideally, something you are excited about! Maybe the general topic has been assigned to you, so you feel you don't have much choice. Even so, as presenter you have free reign over what aspects of the topic are most suitable for a talk, and how it would be best presented. This is *your talk!*

3. Medium

Several choices of medium are available from low-tech (such as blackboard) to high-tech (electronic projector). Each method has its advantages and disadvantages. Many speakers prefer to project slides, designed using *PowerPoint* (general purpose slide presentation software, which however requires some effort and experience before mathematical symbols and formulas can be incorporated) or *beamer* (currently a very popular LaTeX package for developing presentations with mathematically technical content). Well-written slides will help keep you (the speaker) on track during the actual presentation, not forget any essential definitions or points, and incorporate any helpful illustrations. Unfortunately this method also encourages speakers to overload their talks with too many details and to proceed too quickly.

Ask a few mathematicians about the best talks they have ever heard. Many will tell you that the best talks they have heard were presented on the blackboard. The three best math talks I have ever heard were all presented by John Conway (Princeton University).



4. Detail

The most important dictum is the KISS rule—Keep It Simple Stupid!

You would do well to ensure that the entire audience understands the first 1/3 of your talk. And you may want to progress in level throughout your talk so that by the end of your talk, you have mentioned something that may provide the experts with food for thought.

A popular rule of thumb in math talks is to present, during the course of your talk, one proof. There is much wisdom in this approach—select one result from your talk which is representative of your main results, and give a brief (at most 5-minute) outline of the proof. Details can be omitted in favor of summarizing the key ideas in the proof. On the other hand, many good talks contain no proof at all!

Avoid the widespread ‘Death by PowerPoint’.



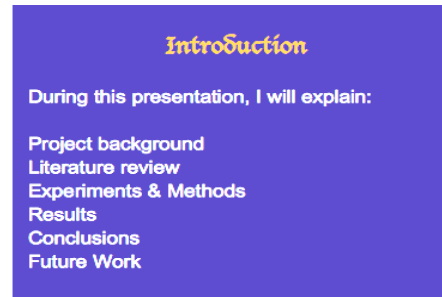
5. Slides

For your final presentations, most of you will be using slides. Keep a few points in mind:

- Complete sentences are not required (and usually not advisable) in slides. Speak in sentences, but display a few key words and phrases on slides for the audience to focus on.
- The slides, oral presentation, and written report contain three very different accounts of your work. (How do they differ?)

- Use only large clear fonts which contrast with backgrounds (if any) or your audience will be unable to read!
- Avoid busy (overly complicated) slides.

Good:



Bad:



Never:



6. Delivery

Imagine yourself telling a story. A good story starts off slowly, providing some context which introduces the main characters and themes, then builds momentum as it progresses. Typically

there is some tension, but this is interspersed with moments when the tension is relaxed. Why? and what can we learn from this about giving a good talk?

Here are some rules for giving talks, most of which admit exceptions.

- a. Relax! and don't forget to breathe. If you are uncomfortable, then your audience will be too.
- b. Maintain audience contact. Do not face the screen except momentarily.
- c. Avoid overused pet phrases and interjections.
- d. Use good posture. Stand up straight and avoid nervous mannerisms.
- e. Never go overtime. Better to omit some slides.

Practice in front of a friend with whom you are comfortable enough that they can honestly point out some mistakes that you are making.

7. Spice

Consider the appropriate use of visual aids: an appropriate card trick; displaying a video clip; anything that will involve another part of the audience's brains.

8. Acknowledgements

Give credit where credit is due! A common mistake is to not mention sources. This often follows from the mistaken notion that by acknowledging sources, you will appear less original. On the contrary, citing your sources can only create a better impression of your work. *Special hint:* If you know in advance that someone in the audience has worked in an area related to the subject of your talk, you would do very well to acknowledge

this work. (Afterwards they are likely to tell everyone what a great talk you gave!)

9. Improving Your Skills

Take a hint from Stephen King¹: "If you want to be a writer, you must do two things above all others: read a lot and write a lot. There's no way around these two things that I'm aware of, no shortcut." King learned what not to do, as well as what to do, by reading a variety of books by other authors. A similar dictum holds for would-be presenters: To learn to give talks, you must do two things: listen to talks, and practice giving talks.

10. Final Advice

Glenn Gould wrote the following vocal fugue. Listen to it (or read it) and discuss the parallels between his advice.

So You Want to Write a Fugue

So you want to write a fugue.
You've got the urge to write a fugue.
You've got the nerve to write a fugue.
So go ahead, so go ahead and write a fugue.

Go ahead and write a fugue that we can sing.
Pay no heed, Pay no mind.
Pay no heed to what we tell you,
Pay no mind to what we tell you.
Cast away all that you were told
And the theory that you read.

As we said, Come and write one,
Oh do come and write one,
Write a fugue that we can sing.

Now the only way to write one
Is to plunge right in and write one.
Just forget the rules and write one,
Just ignore the rules and try.

And the fun of it will get you.
And the joy of it will fetch you.
It's a pleasure that is bound to satisfy.

¹ *On Writing*, Stephen King. Pocket Books, 2002.

When you decide that John Sebastian must have
been a very personable guy.

Never be clever
for the sake of being clever,
for the sake of showing off.

For a canon in inversion is a dangerous diversion,
And a bit of augmentation is a serious temptation,

While a stretto diminution is an obvious allusion.
For to try to write a fugue that we can sing.
And when you finish writing it
I think you will find a great joy in it.
or so...
Nothing ventured, nothing gained they say
But still it is rather hard to start.

Well let us try right now.
Now we are going to write a fugue.
We are going to write a good one.
We are going to write a fugue ... right now.