Some notes on giving an effective research presentation

Telling your research “story”
Humans find stories easier to follow and digest than bunches of abstract or uncontextualised facts, so structuring your presentation as an idealised chronicle of your research journey will greatly aid audience interest and comprehension. To see what I mean by this, consider the following 3MT presentations.

Sandra Garrido: “The paradox of listening to sad music”.
http://www.youtube.com/watch?v=aiTyXwe2nm4

| 1. What was the motivation for the research? | “Given this human preoccupation with the pursuit of happiness, it seems unlikely the people would deliberately seek out things they know will make them sad – and yet we do.” |
| 2. What was the main aim of the research? | “So my research addressed the interesting question: Why do people listen to sad music?” |
| 3. How was the research conducted? (And highlighted contribution) | “My research is one of the first to conduct an empirical investigation ... and to consider the role of certain personality differences. ... In a series of 3 studies I tested over 200 people ...” |
| 4. What were the key findings? | Discovered co-relation between absorption & music empathy with a liking for sad music. May help some purge negative emotions but for those with mood disorders, may be attractive but make things worse. |
| 5. What are the important implications of those findings? | “My research not only addresses a fascinating philosophical question, but can also help us better understand human emotion, the function of music in society and the potential for music to help people with mood disorders.” |
| 6. What is a takeaway thought for the audience? | “So the next time you have that favourite tragic love song on repeat ..., you may want to ask yourself if you’re benefiting from that, if ...” “Thank you.” |

What “more detail” could be given in a longer talk?
• “My research is one of the first to conduct an empirical investigation ... and to consider the role of certain personality differences. ... In a series of 3 studies I tested over 200 people ...”
  – What personality differences and what are the theoretical underpinnings of these choices?
  – What exactly was tested in the 3 studies? How did each study complement or inform later studies?
  – What were the characteristics of the 200 people? How chosen and why?
  – How were the results analysed?
• Discovered co-relation between absorption & music empathy with a liking for sad music. May help some purge negative emotions but for those with mood disorders, may be attractive but make things worse.
  – Explain more what “absorption” and “music empathy” mean and the theoretical underpinnings of these constructs.
  – Give more detail on the strength of the co-relation and how well negative emotions may be purged or how much worse things might get for those with mood disorders. (Define “worse” and how much of a difference on the measurement scale was observed.)
Balarka Banerjee: “Lung Transplants – Making the Second Chance Count”.
http://www.youtube.com/watch?v=tJAO-zPoamY

| 1. What was the motivation for the research? | “>80% probability that within the next 7 years the new lungs will fail as well. ... This is not well understood, not preventable and not curable.” |
| 2. What was the main aim of the research? | “The main aim of my thesis was to better understand this disease ...” (”... not many people have looked at these cells before because they are very difficult to collect.”) |
| 3. How was the research conducted? | Used novel brush to collect cells from lungs and grew in lab. |
| 4. What were the key findings? | Discovered cellular transformations like those found in some cancers and in the foetus. |
| 5. What are the important implications of those findings? | “Chronic ‘rejection’ is not rejection at all => why rejection drugs don’t work.” |

There were also some more finding (Erythromycin can prevent this process) and more implications (Better drugs can really make that “second chance count”).

Having a framework of questions (that your target audience would want answered!) to address in your talk will help keep it focussed and provide a narrative structure which is easy to follow.

Presenting with style and clarity
What else made Balarka Banerjee’s presentation so effective?

1. Started the talk by explaining (creatively) why the research was interesting / important.
2. Didn’t speak too fast ... but did stress important points for emphasis and to be engaging.
3. Looked around the audience (made eye contact) to engage with them.
4. Helped you understand by relating new ideas to things you would probably be familiar with:
   - “… lungs fill with a thick, fibrous tissue similar to what is found in scar tissue or a tumour.”
   - “Now acute rejection, which you are probably more familiar with, is when ... In contrast, chronic rejection …”

Making technical talks comprehensible, especially to a general audience
- Even to an “expert audience”, many research presentations are too technical for all but a few in the audience – being in the same field does not mean you are on top of the technical details in all sub-fields.

To make your talk more comprehensible:
- Use analogies
- Relate new concepts / ideas to things the audience can be expected to know about
  Example 1: Jennifer Campbell, “Nanocantilevers: a new tool for medical diagnostics.”
  http://www.youtube.com/watch?v=kuRw_4VSp44

Top presenters use brief pauses effectively:
- before and after statements they want to stress or highlight
- after key ideas to allow a moment for them to sink in
- to signal transitions to a new part of the talk.
It works like a human nose, sniffing out human breath for the presence of certain molecules.

Now nanocantilevers are like tiny little diving boards. ...

They’re really tiny, about 100 times smaller than a human hair.

Example 2: Curtis McEwan, Uncertainty Propagation in Nuclear Reactor Physics Calculations: https://www.youtube.com/watch?v=QdQls4ZRzqc

How you would approach this task depending on whether you are talking to a general audience or a specialist audience:

• A general audience can’t be expected to know what Molybdenum (Mo) is and why it is of interest, so spending a few seconds explaining is worth doing:
  – E.g. “Molybdenum is a metal [people know what metals are!] which is useful for making high strength alloys and super alloys with steel.” [people know well enough what steel is]

• This phrasing would be “dumbing down” too much for an engineering audience, but if you incorporate the background into your argument, it won’t seem like dumbing down and will help those who have forgotten or work in a different area:
  – “Because of Molybdenum’s importance in the manufacturing of high strength alloys and super alloys, it is important to ...”

Helping the audience understand

Study these two examples for how the speaker doesn’t just say, “X is a problem”, but helps the audience understand why X is a problem:

• Suzie Ferrie: “Measuring Nutrition in ICU” http://www.youtube.com/watch?v=uRujtX1MudQ (Note that this is a “proposal”, the research had not been completed at the time of the talk.)
  – For a specialist audience, possibly wouldn’t need to explain this much, but could perhaps just say, “As you know, when a patient is in intensive care, the classic ways of assessing nutritional status, namely x, y and z, do not work very well. Consequently, my research looked at ...”

• Sumaiya Ahmed: "The waiting game in the movie industry: Timing decisions for DVD release". http://www.youtube.com/watch?v=SI8XOGubJyY
  Not simply: “Studios need to decide when to release a DVD in relation to box office release of a movie.” But also, “release too early and <one problem>, release too late and <another problem>”.

Secrets to a powerful and engaging introduction

The first question any presenter should address is: “Why on earth would anyone be interested in my talk?” Your goal in your introduction is to answer this question for your audience. In addition:

1. If the session chair introduces you and your presentation’s title, you don’t have to again.
   Besides, your name and the title are on your PowerPoint slide and the audience has already read it before you start speaking. Observe that none of the 3MT presenters started their talk with, “Good morning, my name is ... and today I want to talk to you about ...”. So, get straight into the motivation(s) for your research; it will get your audience “hooked” too!
2. Getting your audience hooked:
   a. Start with a puzzling question (that the audience can relate to): e.g. “If we all want to be happy, why do we actively seek out sad music to listen to?”
      http://www.youtube.com/watch?v=aITyXweZnm4
   b. Or, start with an interesting problem that needs solving: e.g. “What is the best time to release a DVD in relation to the box office run of a popular movie?”
      http://www.youtube.com/watch?v=SI8XOGubjY
   c. Wherever possible, try to make it personal for your audience: “Imagine you …”; “Who has ever experienced … and wondered …?”; “What would happen if you …?” E.g. http://www.youtube.com/watch?v=uRujtX1MudQ

How much can you say?
- For a short, highly polished talk like a 3MT presentation, a good pace is about 160-170 words per minute (any faster and the audience will have trouble keeping up). Allowing for a 10-15 second safety margin, this means about 450-470 words in total. (This is the only situation where memorising a script would be a good idea, but work on your presentation style!)
- For longer, less polished talks, a speaker would probably average around 100-120 words per minute.
- Talks tend to average one slide every one to two minutes. Excluding title and reference slides, a short talk might be okay with slightly more slides than there are minutes in the talk, but generally talks would have fewer slides than there are minutes for the presentation, and the difference would increase as the length of the presentation increased.

Polishing your performance
One powerful way to work out how your talk content or presentation style could be improved is to listen to yourself give your talk so you can hear firsthand how it will come across to your audience. This can be done by recording a voice over PowerPoint presentation:

1. Put palm card notes onto PowerPoint slides.
2. Go to the “Slide Show” tab and click on “Record Slide Show”.
3. After you click on “Start Recording”, wait until the clock counter starts ticking over to start speaking or you’ll cut off the start of your talk.
4. Use mouse clicks to progress through slides as per normal.
5. Hit “esc” or “enter” to stop recording. Again, wait a second after you stop speaking to do this.

Going to “Slide Show” will play back your presentation.

Some things to check:

1. Did you keep to time? (PowerPoint times your talk for you.) If your talk is overlong, think about cutting content or making your presentation more efficient (i.e. using fewer words to say the same thing) rather than speaking faster.
2. Did you use pauses effectively: to highlight or emphasise key points? To give your audience time to digest what you have just said? To mark a transition to a new component of your talk? If not, try putting pause marks on your notes or use line breaks to facilitate pausing at appropriate points.
3. Did energy or enthusiasm come across in your voice?