

COMMUNICATE YOUR SCIENCE! ... SUPER SEMINAR SLIDES

Bernard S. Brown

It's your first research talk. You've spent months doing the work and weeks writing the talk, and at last you're nearly ready. Although you found writing the talk not too difficult, there was one aspect that perplexed you – the slides. You felt that you ought to have some slides and you were told that you'd have to design and prepare them yourself. But, little advice was given. Fortunately, your department has a photocopier that can copy directly onto acetate sheets for an overhead projector (OHP), so you decide to use that. You photocopy some nice-looking graphs, a couple of impressive-looking tables and a diagram or two. You also type and photocopy some summaries. So, now you are ready.

Your audience files in and you begin. As your talk proceeds, you ignore the puzzled looks and the craning necks as detailed slide after slide is flashed before the audience. Finally, you finish and cannot understand the

stunned silence or the lack of questions. 'Did I do something wrong?', you ask yourself.

The answer is, probably, yes. Assuming that your talk was well thought out, not too long and delivered clearly, in all likelihood the problem lies with the slides you used. Only too often, slides are considered to be an optional extra to a talk and are prepared at the last minute, without thought for their design and content. Only too often they contain far too much information. Why not do better next time by designing some 'super seminar slides'? You can use the word **SLIDE** to remind you of the guidelines that apply to both 'ordinary' projector slides and acetate sheets for overhead projectors.

SL – SIMPLE AND LEGIBLE

These two rules are so important that it's difficult to know which of them to put first. To make impact, and

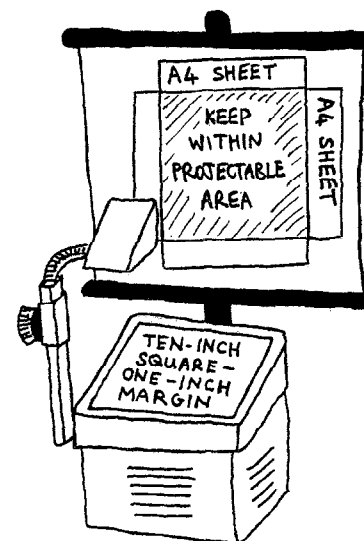
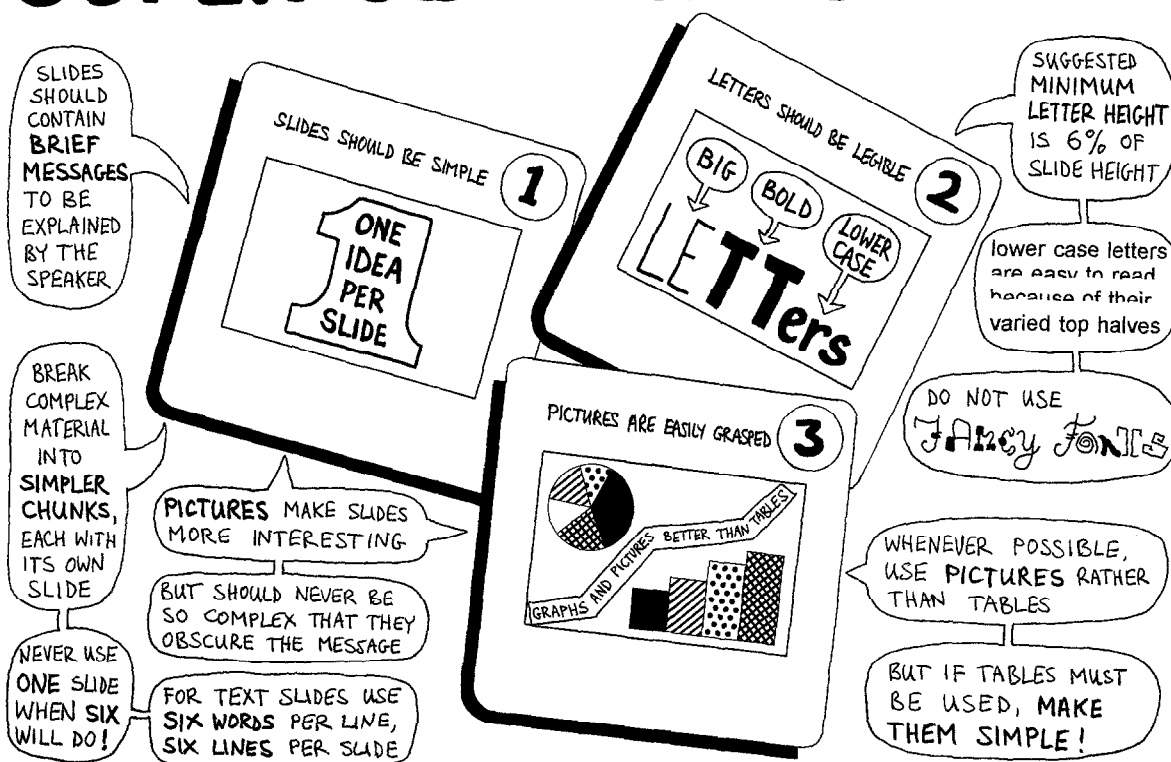


FIGURE 1

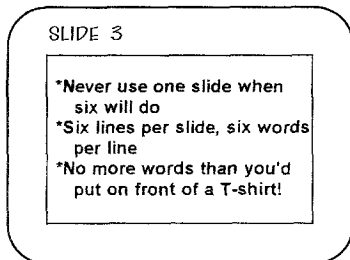
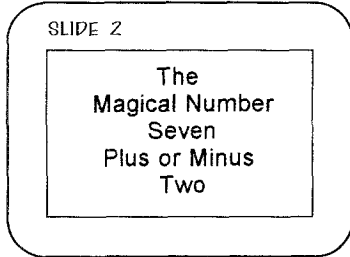
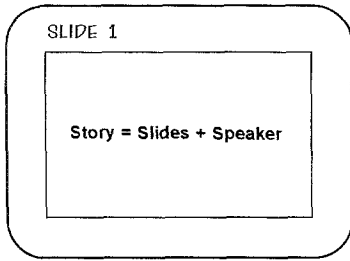
to be understood, a slide must be both simple and legible.

Simplicity means thinking about what is going onto a slide and making it as clear and uncluttered as possible. A slide should present one idea only – but it should need you to explain what it is saying. If you were to give a talk about giving slide presentations, for example, you could show Slide 1 and say something like: 'Slides are not intended to tell the whole story. They summarize and make a point that you

SUPER SEMINAR SLIDES!



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then amplify and explain. The story is the slide, backed up by the speaker's explanation.' Then, you could show Slide 2 and say, 'The American psychologist George Miller, in a paper published in 1956, concluded that people listening to a talk were able to remember about seven pieces of information, plus or minus two.' Next, addressing how much information should go onto a slide, you could show Slide 3 and say, 'Many rules of thumb have been devised to guide the slide maker. Here are three of them. In a presentation, divide your material into short chunks and put each chunk on its own slide. For slides containing words only, try to keep to six lines, each containing no more than six words. More graphically, you could say that you should never put more words on a slide than you could get onto the front of a T-shirt. All these statements, and others not included here, are merely guides, not holy writ!'

No matter how simple a slide is, its impact is lost if it is not legible. Legibility means both the area of slide covered and the size and style of typeface used. Remember that you only have about 2 cm² of slide, or about 700 cm² of OHP acetate sheet to contain your message, so don't overcrowd it. Indeed, OHP sheets carry hidden risks. They are commonly supplied in two shapes, square or oblong. The square is 10 in.

(267 mm) X 10 in., which is difficult to file in an A4-based filing system, but which fits the square OHP platen perfectly. However, not all the area is projected. The oblong is A4 (297 mm tall by 210 mm wide), which is filed easily but is too tall and too narrow for the OHP platen. The point is that you need to decide beforehand what is the usable area of these sheets. A useful rule of thumb (Fig. 1) is to leave a 2.5 cm (1 in.) margin around the square sheets, to give a working area of 470 cm². For A4 sheets, you can use the area formed by two A4 sheets overlapped as shown in Figure 1. This is a square of side 21 cm, giving an area of 441 cm².

Legibility also includes letter-size and letter-style. A rule-of-thumb states that letter-height should be 6% of slide-height. This means 1.2 mm for 35 mm slides and 1.2 cm for OHP slides prepared as above. For letter-style, you should use lower-case rather than capitals because they are easier to read, particularly if there is line after line of them. Traffic signs use lower-case lettering for this reason. Use a simple letter-style and avoid use of many varied fonts.

I - INTERESTING

The slides shown so far are all simple and legible. They do the job that a slide should do - communicate information to the viewer. But they are all boring because they contain only words. Words are not visuals, so if you want to make your slides interesting you should include visuals too. Compare Slide 2 with Slide 4, and Slide 3 with Slides 5-7; the two sets of slides say the same thing - but which do you think is more interesting? Notice that these visual versions contain fewer words, make their point more vividly and will need a little more explaining from you!

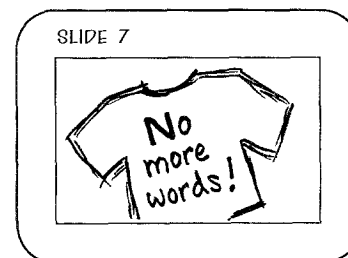
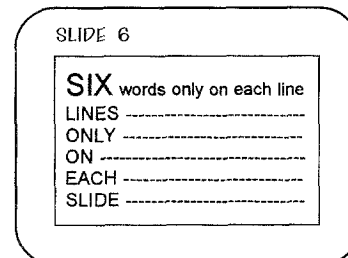
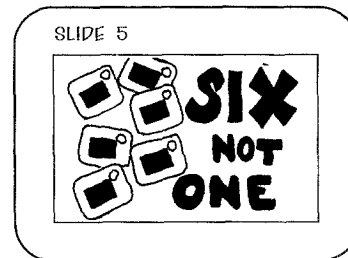
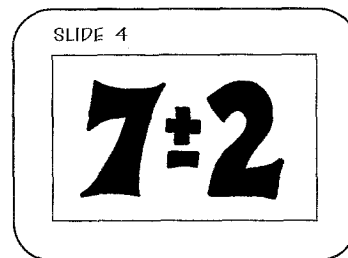
One point to watch here is 'art versus science'. You should never let a diagram or illustration obscure your message. If you use too many vivid colours, if you use arty drawings rather than simple sketches, or if you use three-dimensional pillars for bar charts, then these devices might prove distracting. Think carefully about whether to use them.

D - DESIGNED

By this, I mean thinking about not only what is to go onto a slide but whereabouts in your square or oblong it is to go. Books on graphic design go into such matters in detail, but I would

go so far as to say that if it looks right it very likely is right! We all have an instinctive design-sense that tells us when something doesn't look quite right. One way to cultivate your design-sense is to look at other people's examples. Examine the graphics in newspapers and on television programmes. Keep an 'ideas file' of adverts, brochures, pictures, diagrams and flow-sheets that might be of use to you. If you find this advice too vague then try the following tips:

- Place captions in prime spots on the slide: top-left above the drawing or bottom-middle beneath the drawing.
- Avoid vertical captions since they are harder to read. They may be all right for factory chimneys, but, for your slides, put the letters on their sides, reading upwards.
- When drawing graphs, use bold rather than spidery lines. You will find some ideas on the accompanying cartoon on page 74.



Also to consider under design is 'table manners'. By this, I mean the use and abuse of tables on slides. How many tables have we seen that filled the slide and, to add to our difficulties, had a six-line caption underneath? Such tables are frequently copied from books. Tables in books are all right – in books. But with tables on slides, your audience will find it difficult to read, analyse and compare columns and lines of numbers. If you want to use complicated tables, then you can save yourself a lot of trouble by copying a sheet from a British Rail timetable to use as a universal table! Nobody will be able to read it, so you can make it mean what you like! If you want your tables to be easy on your audience,

then keep them simple – not too many columns, not too many lines. Better still – translate the table to a more pictorial form – bar chart, graph or drawing.

E – Easy

Your slides should be easy. Their content should make them easy to take in and understand. Their design should make them easy on the eye. One book points out that a slide presentation is a theatrical performance, a one-person show, with the audience wanting to be delighted with what it is seeing. If it is, then the audience will remember your slides long after your talk has ended. And those attending will also have fond

memories of you as a good communicator who presented some super seminar slides!

Here's where to find more help:

- ANHOLT, R. R. H. (1994) *Dazzle 'em with Style – The Art of Oral Scientific Communication*, pp. 99–124, W. H. Freeman
- BIRCH, N. J. (1988) The rule of sixes, *Biochem. Educ.* 16, 22
- BRISTOE, M. H. (1990) *A Researcher's Guide to Scientific and Medical Illustrations*, pp. 123–133, Springer-Verlag
- SIMMONDS, D. and REYNOLDS, L. (1994) *Data Presentation and Visual Literacy in Medicine and Science*, pp. 123–128 and 135–144, Butterworth-Heinemann

Microscopy animations on the Web

Lance A. Ladic and Alison M. J. Buchan

The advent of the World Wide Web has enabled the presentation of multimedia content on the Internet and has simplified access to information. This communication technology holds great promise for the dissemination of scientific animations between researchers around the world, something that is not easily done with existing media. This article will examine some of the issues surrounding microscopy animations on the Web: what is out there, how to find it, how to put your animations on line and what is in store for the future. Although the primary focus of the article is on microscopy, the topics discussed are also of general relevance to other types of scientific animations on the Web.

Types of animations

An increasing number of researchers around the world are generating animations from digital microscopy data and are putting these on the Web to communicate their research to colleagues. These offerings include data from confocal microscopes, high-resolution charge-coupled device (CCD) cameras and other cellular-imaging devices. The animations are typically in the form of either time-lapse sequences depicting

changes from image to image, or animations of three-dimensional (3-D) reconstructions generated from sequential stacks of 2-D images through a specimen.

Locating microscopy animations on the Web

Although there are many microscopy animations on the Web, there is no central repository from which they can be accessed. Conducting keyword-based queries with Web search tools does not guarantee success. Attempts have been made to compile a list of institutions that are involved with microscopy research (most notably at the Microscopes and Microscopy Web Page at <http://www.lars.bbsrc.ac.uk/micro/>). However, there are numerous sites with animations that are not listed. So, how do you locate microscopy animations on the Web?

The most common source of news about new and existing animations are Internet mailing lists and Usenet newsgroups (see Box 1). Mail and News archives on the Web can also be searched for the mention of animations. A helpful trick is to use keywords related to animation formats, such as 'MPEG' and 'QuickTime', in these queries.

As part of a Web page that I maintain (<http://www.cs.ubc.ca/spider/ladic/confocal.html>), I have compiled a list of sites that have animations related to 3-D confocal microscopy. Typically, most Web sites present only a small number of microscopy-related animations. Each of the following sites utilizes animation in a different way to present their research, and each serves as an example of how the Web can be used to transfer visual information between colleagues. 'FishScope' (<http://weber.u.washington.edu/~fishscop>) contains an archive of time-lapse recordings and confocal microscope images dealing with the developmental biology of fish. Through viewing these animations, you can follow the movement of individual cells at different stages of embryogenesis. Similarly, an animation that follows the temporal development of a *Caenorhabditis elegans* embryo at a single focal plane (using a confocal microscope) can be found on a Web page at the Integrated Microscopy Resource, University of Wisconsin-Madison, USA (<http://www.bocklabs.wisc.edu/imr/instruments/4da.html>). Animations of 3-D reconstructions of cells microinjected with modified oligonucleotides can be found on Daniel Chin's home page from The Agouron Institute, La Jolla, CA, USA (<http://agi.org/otherD/Dan.html>). Some of these animations demonstrate the application of a blind deconvolution algorithm to improve the resolution of linear structures in all viewing

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