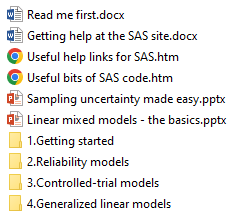
**How to Use This Resource**

You have downloaded a zip-compressed folder called **Mixed-model Workshop.zip** from sportsci.org, or someone has sent you the folder. You have unzipped the folder in some suitable place on your computer. Inside the folder you have found these files and folders (not necessarily in this exact order):



You have opened this file, **Read me first.docx**.

**Getting help at the SAS site.docx** tells you how to access frequently asked questions, online-discussion forums, and the SAS tech team. Use it when you start to program independently. Another useful approach is simply to Google your problem, which will often take you to resources at the SAS site.

**Useful help links for SAS.htm** contains links to documentation on SAS programming at the SAS site that I use frequently. You will find this file useful when you write SAS programs independently. It will open in a browser, when you should then bookmark it or make it a favorite. Within SAS Studio, you can also get immediate help for keywords in data steps and proc steps from the pop-up window, when SAS recognizes part or all of the word you are typing. Links there also take you to the documentation. Keywords appear in blue: if, then, else, drop, keep, and so on. Unfortunately there is no immediate help for functions in data steps, such as log(), abs(), mod(), but these also turn blue when SAS recognizes them.

**Useful bits of SAS code.htm** contains code that I have worked out for doing various fiddley or esoteric things that would take you ages to work out again or find in the documentation. Again, open it in a browser and bookmark/favorite it.

**Sampling uncertainty made easy.pptx** is for the benefit of anyone who has not previously learned about the different ways of dealing with sampling uncertainty and statistical inference: compatibility (confidence) intervals, tests of (non-)substantial hypotheses, Bayesian probabilities, magnitude-based inference, and the test of the nil hypothesis (statistical significance and non-significance). This slideshow is available at Sportscience <https://sportsci.org/2022> in the article about replacing statistical significance with other approaches. A more academic slideshow dealing with tests of (non) substantial hypotheses and the associated error rates is available at Sportscience <https://sportsci.org/2020> in the article on magnitude-based decisions as hypothesis tests.

**Linear mixed models – the basics.pptx** is a short slideshow on mixed modeling. Don't expect to understand everything straight away: it takes considerable time and experience to learn how to model standard deviations along with the usual means! You will understand the concepts better when you start *using* mixed models. General and generalized linear models are dealt with in more detail in the slideshow **Linear models and effect magnitudes** at Sportscience.

The folder **1.Getting started** contains two docx files of instructions, which you should open and work through in this order:   
 **How to access SAS Studio.docx  
 Subject characteristics with SAS Studio.docx**.

Then work through the files in the remaining folders in this order:   
**2.Reliability models**  
**3.Controlled-trial models**  
**4.Generalized linear models**.

Note: The instructions and screen shots in **3.Controlled-trial models** and **4.Generalized linear models** relate to an earlier version of SAS Studio running entirely on your laptop. With the new on-demand version running in the cloud, you have to create folders within SAS Studio and upload spreadsheets to the folders. I changed the instructions accordingly in **1.Getting started** and **2.Reliability models**, but I got lazy after that. You will have to ignore the instructions to "find" the relevant spreadsheet in the relevant folder on your laptop; instead, you will have to create the relevant folder in Studio and upload the relevant file from your laptop before proceeding.