

General Guidelines for Analyzing Data

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- Plot the raw data. Do you notice anything suspicious? Is there any suggestion of a possible time order effect?
- What are some plausible models for the data? How could you fit these models? How could you tell if there was significant lack of fit in any of the models?
- Plot the residuals from each fit.
 - Plot versus predicted values from the model.
 - Plot versus time order. Look for trends, jumps, etc.
 - Plot versus other variables.
 - Do an auto correlation plot.
- Do the residuals suggest the use of other models? (E.g., transformation of variables, or addition of new ones)
If so try them and repeat checking.
- Do the residuals suggest that that "weights" should be used?
If so try them and repeat checking.
- Might a simpler model work just as well? E.G. one ^{with} fewer variables.
Try any candidates and see what happens.
- Do the residuals suggest that some points might be outliers?
If so, temporarily set them aside and repeat fitting and checking.
- Is the magnitude of the observed random variation in keeping with what was expected? If not, why not?
- What are the weak spots in the way the experiment was run?
 - Was randomization used?
 - Were all measurements made in quick succession or under only ^a limited set of conditions?
- What assumptions have you made in carrying out the analysis? How reasonable are these assumptions? How could they be checked?