NR140 Group Work Factorial ANOVA

This week we will use the same UVB radiation and frogs data set that we explored with the One-Way ANOVA last week. Remember that for this study, frog eggs at 3 different ponds in the Cascade Mountains (Washington State) were held in situ in randomly placed water permeable containers (12 at each pond). Three possible treatments were randomly applied to each of the 12 containers: no cover, a filter cover that allows UVB radiation to pass through and a filter cover that blocks UVB radiation. After several weeks, tadpoles were collected from the containers, identified to species level, and the proportion of deformations for each species recorded (Response).

Last week you prepped your data for JMP formatting so that all of the response variable was stacked into one column, with modifying columns to specify to which filter treatment, species and site each observation belonged. Last week you tested and found that there was a significant difference between filter treatments. This week will dig deeper.

Your task is to examine if the impact of UVB radiation on the proportion of deformed tadpoles differs by **filter treatment**, **site**, and **species**. Be sure to also include the possible **interaction between species and treatment**.

1. Is your data normally distributed?
    - (If not remember that for a FACTORIAL ANOVA you will have to transform your data (ranks will force a Friedman's K-way ANOVA). This may be easier to do in excel than JMP since ties must use the average rank)
    - Be sure to check the nature of your data when importing into JMP (Treatment, Site and Species are all categorical variables. If not listed as such, you will get a mixed model regression instead of a Factorial ANOVA!)
2. Report the name of the test you will you to address this research question (be specific).
3. Are any of your main effects are significant? IF so, describe the differences.
4. Are any of your interaction effects are significant? If so, describe the interaction.
5. Summarize: Write a concise one paragraph summary of this analysis. Remember that any summary should include the following:
    a. Statement of the research hypothesis or study objectives
    b. Brief summary of methods (one sentence or less) including the statistical test used.
    c. Statement of the statistical results (including type of test and shorthand)
    d. Description of any follow up tests, nature of any differences,
    e. Interpretation of how meaningful, along with an interpretation of the implications of these results, why these results make sense (or don't make sense).

ALL DONE…Be proud…you've just tackled a rather complicate analysis without panicking