General

* **Differences between scenarios for BF[1], BF[2], CB[1], SP/RM[1;1], LS[1]**
* Decomposition for **BF[1], BF[2], CB[1], SP/RM[1;1], LS[1] (“ANOVA-doku” – filling in blanks in the tables)**
* Statistical model notation and ANOVA table for **BF[1], BF[2], CB[1], SP/RM[1;1], LS[1]**
* Why do we randomize?
* Why do we replicate?
* What are the following items in an experiment:
  + Factors
  + Levels of a factor
  + Treatments
  + Blocking (if any)
  + Experimental Unit(s)
  + Response Variable
  + Interaction (if any)
  + Statistical Model
  + Writing the null and alterative hypothesis for any model.
  + The degrees of freedom for doing any type of ANOVA F test for any factor (both numerator and denominator)
* What is the definition of an interaction? – pg 210
* Why do we do a “blinded” study?
* Notation for the Factor Structure
* Know how to use software for each of the following designs: **BF[1], BF[2], CB[1], SP/RM[1;1], LS[1], BF[3]**
  + **Descriptive Statistics**
  + **Check Requirements**
  + **Do an ANOVA using R**
  + **Interpretation**

There are four different but similar scenarios. You are to determine the following:

* The correct design
* Factors
* Levels of a factor
* Treatments
* Blocking (if any)
* Experimental Unit
* Response Variable
* Interaction (if any)
* A partial ANOVA table with Factors and degrees of freedom for each factor
* All of the null and alternative hypotheses
* Statistical model notation

1. You are an expert piano teacher, and you are interested in the effect of curriculum emphasis (sight reading or music theory) to improve students’ ability to learn playing the piano. There are 24 piano students that volunteer for this study. You randomly select 12 students to have a sight reading emphasis and 12 students a music theory. At the end of the six-month study, you give each student a piano competency exam and give them a score (scores ranging from 0 to 100).
2. You are an expert piano teacher, and you are interested in the effect of curriculum emphasis (sight reading or music theory), individual study systems (Bastian or Faber) and the interaction. There are 24 piano students that volunteer for this study. You randomly select 6 students to go to each of the four treatments. At the end of the six-month study, you give each student a piano competency exam and give them a score (scores ranging from 0 to 100).
3. You are an expert piano teacher, and you are interested in the effect of curriculum emphasis (sight reading or music theory), individual study systems (Bastian or Faber) and the interaction. There are 24 piano students that volunteer for this study. Before performing the experiment, you give each student a pre-test and put the students in groups of four based on similar test scores. You randomly pick three groups to do sight reading emphasis and three groups to do music theory emphasis. Within each group, you random pick two student to do Bastian and the other two to do Faber. At the end of the six-month study, you give each student a piano competency exam and give them a score (scores ranging from 0 to 100).
4. You are an expert piano teacher, and you are interested in the effect of individual study systems (Bastian or Faber). There are 24 piano students that volunteer for this study. Before performing the experiment, you give each student a pre-test and put the students in pairs based on similar test scores. From each pair (there are 12 pairs), you random pick one student to do Bastian and the other to do Faber. At the end of the six-month study, you give each student a piano competency exam and give them a score (scores ranging from 0 to 100).