

STAT 217: Tennis Ball Activity 9/23

In this activity, you will measure the diameter of tennis balls in centimeters using three methods:

- string
- flashlight
- rolling

Work through the following questions. **Turn in one sheet for your group before you leave class today.**

1. What is the response variable? Is it categorical or quantitative?
2. What are the two explanatory variables? Identify each as categorical or quantitative. (Hint: the second explanatory is group. There are 8 groups in the class today.)
3. Use the rulers and materials provided, have each person in your group measure the diameter of the tennis balls with all three methods. Record each person's measurements here.
4. Find the average diameter length for each method.
5. Provide two reasons why people in your group may have gotten different measurements even though they used the same methods (string, flashlight, and rolling).
6. Find another group and write down that groups' data below. Include the names of the people in the group you get the data from.

7. Find the average diameter length for each method for the other group's data.
8. Draw an interaction plot with your data and the other group's data. Include the means and all the data points on the plot.
9. Does there appear to be an interaction between measuring method and group? Explain how you know.
10. Describe what it means to have an interaction between measuring method and group in this context. Think hard about this one, and explain it thoroughly. I encourage you to use pictures in your explanation.
11. Write out the two way ANOVA interaction model for this example. What does each parameter represent? What are the possible values for i , j , and k ?