Name:_____ Date:_____ Period:_____

# Chapter 7 Investigation Guide

**Before you begin the written report:**

1.) Choose an athlete or team that you can compare in two different contexts or choose two different athletes or teams that you can compare to each other. Remember that the purpose of this investigation is to compare consistency!

2.) Choose a single numerical variable that you will use to measure the consistency of the athlete(s) or team(s) that you chose in step 1.

3.) Find the relevant data on the internet or another source. Many of the websites listed below allow you to copy and paste the data into a spreadsheet program such as Excel. To see the game-by-game results, click on a link that says something like "Game Log" or "Schedule and Results." Do not include playoff games in the data, as these games are played in different circumstances than regular season games.

**To complete the written report:**

1.) Write an introduction which states the question of interest and briefly describes the context of the athlete or team's performances, including noteworthy accomplishments that year and why you chose to use a particular variable to measure consistency. Describe how and where you obtained your data and include the null and alternative hypotheses.

2.) Include the raw data from both contexts and make appropriate graphs to compare the athlete or team's performances. Compare the graphs in detail and include appropriate summary statistics. Give a preliminary answer to the question of interest.

3.) Identify and calculate the value of the test statistic you will use to test the hypotheses.

4.) Describe how to use note cards to simulate the distribution of the test statistic. Then, using the applet, conduct at least 100 trials of a simulation to see what values of the test statistic could happen by random chance, assuming that the null hypothesis is true. Include a well-labeled dotplot to display the results of the simulation.

5.) Use the results of the simulation to estimate and interpret the p-value. Then, make an appropriate conclusion about the hypotheses based on the p-value.

6.) Discuss any limitations or possible errors you may have made in your conclusion. If there is convincing evidence of a difference in consistency, discuss possible causes as well as the type of error committed.

Name:_____ Date:_____ Period:_____

# Chapter 7 Investigation Guide: Checklist

- ☐ **Title Page**
- ☐ **Table of Contents**
- ☐ **Introduction**
  - Introduce the athlete/team (include any accomplishments)
  - What is the question of interest and why did you select this topic
  - Describe how and where you obtained your data
  - Give a preliminary answer to the question of interest
  - State your hypotheses
- ☐ **Table**
  - Table of the raw data for all distributions
- ☐ **Dotplots**
  - Raw Data, Deviations, Simulation
  - Compare all the dotplots (Using SOCS)
  - Discuss what positive and negative values mean
  - Discuss the summary statistics (min, max, mean, med, range, IQR)
- ☐ **MAD (1/2 Page)**
  - Calculate the MAD for your data
  - Discuss the note card simulation
- ☐ **SD (1/2 Page)**
  - Calculate the SD for your data
  - Discuss the note card simulation
- ☐ **Test Statistic (1/2 page)**
  - Identify and calculate your test statistic-discuss what you used
  - Discuss the process of how to achieve your test statistic
- ☐ **Simulations**
  - Dotplot representing the information of the simulation
  - Brief explanation of the dotplot (estimate and interpret you p-value in the explanation)
    - Compare the dotplot (Using SOCS)
    - Discuss what positive and negative values mean
    - Discuss the summary statistics (min, max, mean, med, range, IQR)
- ☐ **Conclusion**
  - Give a conclusion based on your results. (1 page minimum)
  - Discuss the comparison between MAD and SD. Is one larger than another, why?
- ☐ **Errors/Causes**
  - Discuss the type of error that may have been made
  - Discuss the possible reasons for your conclusion
  - 1 page (minimum)
- ☐ **References**