Name:_____ Date:_____ Period:_____

Chapter 5 Investigation Guide

Before you begin the written report:

1.) Choose an athlete, team or league that you can compare in two different contexts or choose two different athletes, teams, or leagues that you can compare to each other. You may use the data from the Chapter 4 Investigation or get new data.

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

3.) If using a new athlete, team, or league, find the relevant data on the Internet or another source. Many of the websites listed allow you to copy and paste the data into a spreadsheet program such as Excel. This will allow you to sort the data and do basic calculations. 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 the performances. 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 the 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 ability discuss possible causes.

Name:_____ Date:_____ Period:_____

Chapter 5 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
- ☐ **Table**
  - Table of the raw data for all distributions
- ☐ **Dotplots**
  - Dotplot for each of the distributions
  - Include on the dotplot-mean and median and any possible outliers
  - Brief explanation for each dotplot that describes the max, min, mean, median, range and IQR values and if there are any outliers list them too.
- ☐ **Histograms**
  - Frequency Histogram comparing the data (2 total)
  - Relative Frequency Histogram comparing the same data (2 total)
  - Brief explanation comparing the histograms using the SOCS acronym (1 paragraph for both relative frequency and frequency histogram)
- ☐ **Boxplots**
  - Boxplots comparing the data (2 total)
  - Brief explanation comparing the boxplots using the SOCS acronym
- ☐ **Test Statistic (1/2 page)**
  - Identify and calculate your test statistic-discuss what you used and why you chose it
- ☐ **Simulations**
  - Discuss the note card simulation and applet simulation
  - Dotplot representing the information of the simulation
  - Brief explanation of the dotplot (estimate and interpret you p-value in the explanation)
- ☐ **Conclusion**
  - Give a conclusion based on your results. (1 page minimum)
- ☐ **Errors/Causes**
  - Discuss the possible errors and causes
  - 1 page (minimum)
- ☐ **References**
  - Using appropriate citing rules and techniques, cite all the references used for the investigation