

## Chapter 2 Investigation Guide

### Before you begin the written report:

- 1.) Choose an athlete or team that you are interested in investigating.
- 2.) Choose a categorical variable that you will use to measure the athlete or team's performance in two different contexts (ex. Home vs. away, day vs. night, etc.)
- 3.) Find the relevant data on the Internet or another source. Many of the websites listed below allow you to look at "splits," which break down an athlete or team's performances into different contexts. Do not include playoff games, as these are played in different circumstances as regular season games.

### To complete the written report:

- 1.) Write an introduction which states the question of interest and briefly describe 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. Also, describe how and where you obtained your data and include the null and alternative hypotheses.
- 2.) Display the data in a two-way table and make a bar graph and a segmented bar graph to compare the athlete or team's performances in the two contexts. Compare the graphs, making sure to compare the percentages of success in each context. 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, by using the applet, conduct 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 change of a difference in ability, discuss possible causes.

### Websites with data for multiple spots include:

- ✓ [www.sports-reference.com](http://www.sports-reference.com)
- ✓ [www.espn.com](http://www.espn.com)
- ✓ [www.usatoday.com/sports](http://www.usatoday.com/sports)
- ✓ [Sports.yahoo.com](http://Sports.yahoo.com)
- ✓ [www.si.com](http://www.si.com)

### Website for applet/spinner:

- ✓ [www.whfreeman.com/SRIS](http://www.whfreeman.com/SRIS)

## Chapter 2 Investigation Guide: Checklist

- Title Page**
  - Title
  - Class Name
  - Your Name
  - Period
- Table of Contents**
  - Contents of Each Page
  - Page Numbers
- 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
  - Describe the null and alternative hypotheses
  - Give a preliminary answer to the question of interest
- Graphs**
  - Two-way table
  - Bar Chart
  - Segmented Bar Chart
  - Brief Explanation for EACH graph-what is each graph and table is displaying. (3-5 sentences)
- Simulation**
  - Conduct the applet simulation **ONLY**
  - Explain the procedure and data necessary to conduct the applet simulation
  - Describe how to conduct the simulation using note cards. (Do not do this simulation)
  - Perform 100 trials of the applet simulation.
- Dotplots**
  - Create a dotplot for the applet simulation
  - Explain the results of the dotplot (3-5 sentences)
- Conclusion**
  - Give a conclusion based on your results and simulations (explaining the p-value and what it allows you to conclude. (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