

Sheet 211: Difference in Proportions

Question: Are the Nighthawks better at home than away?
(This is a pretend situation to illustrate the process.)

1. The Nighthawks team win 19 times and lose 21 times out of 40 games **away**. They win _____ times and lose _____ out of 40 games at **home**. (Fill in the smallest number of wins that you think will provide convincing evidence that the team's *ABILITY* is greater at home. Examples are 23, 25, 28, 30, 33, 35, 38.)
2. Write the null and alternative hypotheses.

3. Display the data in a two-way table. (First with numbers then with percentages.)

	Home	Away	Total

%	Home	Away

4. Make appropriate graphs to compare the athlete team's *PERFORMANCES* in the two contexts. Use %.

Name: _____

5. Give a preliminary answer to the question of interest.

You may now use the online applet simulation <http://bcs.whfreeman.com/sris/> or the Fathom simulation.

6. Identify and calculate the value of the test statistic you will use to test the hypotheses.
7. Describe how to use note cards to simulate the distribution of the test statistic.

8. Then use simulation 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. Make a well-labeled **dotplot** in Fathom to display the results of the simulation.

9. 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. Is there convincing evidence of a difference in *ABILITY*? Why or why not?