

Senior Statistics Students

Mr. Hichborn, Statistics Instructor

Projects for any excused days

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The folder contains 7 projects. For every 2 days of excused days off complete one of the projects of your choice.

For example, if there are 4 days excused – you would complete 2 of the projects.

The projects completed will be graded as projects which account for 25% of your quarterly grade.

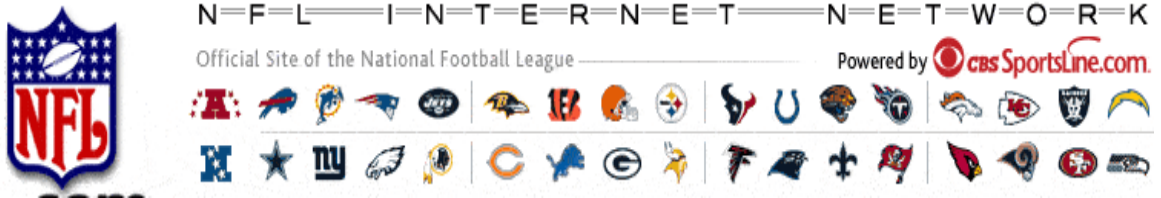
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# PROBABILITY IN SPORTS

- Have students search one of the two sports provided (or find information about a different sport, if desired) to find connections between the sport and probability. Each student or group of students can find and then share a piece of information about chances to win against a particular player or team, chances to make a "hole in one" in golf, chances of making a basket in basketball, or anything else connected with probability that they may find on these sports pages.
- Search for answers to specific questions. Each student or group of students can come up with specific questions concerning sports, and try to find answers using Internet resources.
- Sports challenge: "Do you believe it?" Students or groups of students find pieces of probability information on sports, and then challenge another group to confirm or refute their data. Students do not necessarily give the correct answer, making the activity more interesting. For example, having found that the record drive for a long drive in a golf contest is 448 yards, the students may challenge another group: "Is it true that the record drive is above 470 yards?" Students can give hints, for example, the address of the website where they have found the information.
  1. Web Sites to use
    1. mlb.com - baseball
    2. nfl.com - football
    3. nba.com - basketball
    4. nhl.com - hockey

## NORMAL DISTRIBUTION PROJECT

- STUDENTS ARE TO GO TO THE FOLLOWING SITES:



- EACH STUDENT IS TO SELECT A DIFFERENT TEAM
- FOR THE 2008 SEASON:
  - COMPUTE THE MEAN MARGIN OF VICTORY FOR EACH GAME
  - THE FIRST STANDARD DEVIATION WILL BE A FIELD GOAL (3PTS)
  - THE SECOND STANDARD DEVIATION WILL BE A TOUCHDOWN (7PTS)
  - THE THIRD STANDARD DEVIATION WILL BE 10 PTS.
- PREPARE A CONTROL CHART AND PLOT THE DATA
  - DOES THE EMPIRAL RULE HOLD TRUE FOR WINS (68%, 95%, 99.7%) FOR THE CHART
- FOR THE 2007 SEASON:
  - COMPUTE THE MEAN MARGIN OF LOSS FOR EACH GAME
  - STANDARDS WILL BE THE SAME AS FOR THE VICTORIES
- PREPARE A CONTROL CHART AND PLOT THE DATA
  - DOES THE EMPIRAL RULE HOLD TRUE FOR WINS (68%, 95%, 99.7%) FOR THE CHART

# Memorandum

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**To:** Statisticians  
**From:** Ed Hichborn, NFL Commissioner  
**Date:** 5/12/2009  
**Re:** Frequency Distribution Chart

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Your assignment is to prepare a frequency distribution chart of the top eight teams in each conference during the 2008 season relative to the following characteristics:

1. Passing
2. Running
3. Scoring
4. Turnovers (fumbles, interceptions)

**Do these statistics from the graphs lead to any conclusions about the season.**

## NBA PLAYOFFS PROJECT



- Go to the website for the NBA – [NBA.com](http://NBA.com)
- Click on Statistics then team stats
- Change to the playoffs
- Find the standard deviation for the Home and Opponent Columns (use Microsoft Excel)
- Compute the mean for each column
- Calculate the z scores for each team for each column
- Plot the data on a control chart
- Does the data comply with the empirical rule?

## **FOOTBALL STATISTICS PROJECT**

If you were Bill Belichick would the statistics on the following website provide you with any trends as to the passing and receiving and teams that qualified for the post-season in 2008-09.

[http://sportsillustrated.cnn.com/football/nfl/stats/2007/passing/0\\_byPASS\\_YDS.html](http://sportsillustrated.cnn.com/football/nfl/stats/2007/passing/0_byPASS_YDS.html)

Your assignment is to prepare a frequency distribution chart for the top 50 receivers and the top 35 quarterbacks in the NFL.

Are the charts indicating that the top receivers and quarterbacks on teams that qualified for the post-season?

# Memorandum

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**To:** Statistics Students  
**From:** Mr Hichborn  
**Date:** 5/12/2009  
**Re:** End of term project

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Students are to go to the following website:

[www.82games.com](http://www.82games.com)

1. Once at the website – pick out your favorite Professional Basketball Team.
2. Under the “Headings” Own & Opp.
3. Find the following statistics:
  - a. Range
  - b. Mode
  - c. Median
  - d. Mean
  - e. Variance
  - f. Standard deviation
  - g. Coefficient of variation
  - h. Construct a box and whisker plot of the information

## Scatter Diagrams

How much money will the bank lend to you? It depends on two main factors: how much money you make and what the current annual interest rate is. The following data represent the annual income (I) you would need for the bank to lend the amount (L) to you at a rate of 8.5% for 30 years.

Annual Income (I)	Loan Amount (L)
\$ 15,000	\$40,600
\$25,000	\$67,700
\$40,000	\$108,300
\$55,000	\$149,000
\$70,000	\$189,600

Let I represent the independent variable, and let L represent the dependent variable.

(a) Draw a scatter diagram of the data.

(b) Interpret the slope of the line of best fit for this data set (in sentence form).

(c) Determine the approximate loan amount that you would qualify for if your income were \$49,000. Explain your reasons.