

## NBA BASKETBALL TEAM PERFORMANCE

### RELEVANT JMP PLATFORMS AND STATISTICAL TECHNIQUES

Graph Builder : Scatterplots, Correlation, Simple Linear Regression

### PROBLEM STATEMENT

Collecting and analyzing a variety of metrics that quantify a sports team's playing strategy and performance has become a core part of evaluating a team and comparing that to others. Teams in the National Basketball Association (NBA) have people dedicated to doing this.



The focus of the analysis will be to examine data from the 30 teams in the NBA during the 2022-2023 season using a variety of data visualizations to describe and compare the teams' playing strategies and performance.

## DATA SET

NBA\_Basketball\_Team\_Performance.jmp



Wins	Number of wins in the 82 games of the regular seasons
Losses	Number of losses in the 82 games of the regular seasons
Win/Loss %	Win/Loss percentage
Points Scored	Average points scored pergame
Points Against	Average point scored by opponents per game
Field Goal Attempts	Average number of shots attempted (not including free throws)
Field Goal Scored	Average number of successful shots (not including free throws)
Field Goal %	Average percentage of successful shots (not including free throws)
2 Point Attempts	Average number of 2 point shots attempted
2 Point Scored	Average number of successful 2 point shots
2 Point %	Average percentage of successful 2 point shots
3 Point Attempts	Average number of 3 point shots attempted
3 Point Scored	Average number of successful 3 point shots
3 Point %	Average percentage of successful 3 point shots
Free Throw Attempts	Average number of 3 point shots attempted
Free Throws Scored	Average number of successful 3 point shots
Free Throw %	Average percentage of successful 3 point shots
% of FGA_All 2 Point	Average percentage of all field goal attempts that are in the 2 point range
% of FGA_0-3 ft	Average percentage of all field goal attempts that are within 3 feet of the basket
% of FGA_3-10 ft	Average percentage of all field goal attempts that are within 3 to 10 feet of the basket
% of FGA_10-16 ft	Average percentage of all field goal attempts that are within 10 to 16 feet of the basket
% of FGA_16ft-3pt	Average percentage of all field goal attempts that are beyond 16 feet but within the 3 point line.
FG%_0-3 ft	Average percentage of successful field goal attempts that are within 3 feet of the basket
FG%_3-10 ft	Average percentage of successful field goal attempts that are within 3 to 10 feet of the basket
FG%_10-16 ft	Average percentage of successful field goal attempts that are within 10 to 16 feet of the basket
FG%_16ft-3pt	Average percentage of successful field goal attempts that are beyond 16 feet but within the 3 point line.
Offensive Rebounds	Average rebounds retrieved in offensive zone
Defensive Rebounds	Average rebounds retrieved in defensive zone
Total Rebounds	Average offensive and defensive rebounds
Steals	Average number of steals of the ball from the opponent

Blocks	Average number of opponents' shots blocked
Turnovers	Average number of turnovers of the ball to the opponent
Personal Fouls	Average number of personal fouls made



## EXERCISES

*Tip: Something that may be helpful is to choose a particular color and/or symbol for say the top 5 and bottom 5 teams. This way you can easily see where the data is for these teams in each visualization. To do this, select a desired row(s) and choose Rows > Colors and/or Rows > Markers to choose which to use.*



1. Create scatterplots of Wins vs. the other variables.

**Instructions:** Use Graph Builder. Place 'Wins' on the Y axis, and 'Points Scored' on the X. You can either make separate scatterplots, or create one graph using the Column Switcher tool to change the variable displayed on the X axis. To do so, choose Redo > Column Switcher under the red triangle. Select that current variable used for the X as the Column to Switch, and choose that along with others to use as the Replacement Columns. Choose to display both the points  and a line of fit . You may find it helpful to also display the equation,  $R^2$ , and F Test.

2. Create scatterplots of Points Scores vs. the other variables.

**Instructions:** Use Graph Builder. Place 'Point Scores' on the Y axis, and 'Points Against' on the X. You can either make separate scatterplots, or create one graph using the Column Switcher tool to change the variable displayed on the X axis. To do so, choose Redo > Column Switcher under the red triangle. Select that current variable used for the X as the Column to Switch, and choose that along with others to as the Replacement Columns. Choose to display both the points  and a line of fit . You may find it helpful to also display the equation,  $R^2$ , and F Test.

3. Create scatterplots of Points Against vs. the variables 'Defensive Rebounds', 'Steals', and 'Blocks'.

**Instructions:** Use Graph Builder. Place 'Point Against' on the Y axis, and 'Defensive Rebounds' on the X. You can either make separate scatterplots, or create one graph using the Column Switcher tool to change the variable displayed on the X axis. To do so, choose Redo > Column Switcher under the red triangle. Select that current variable used for the X as the Column to Switch, and choose that along with others to as the Replacement Columns. Choose to display both the points  and a line of fit . You may find it helpful to also display the equation,  $R^2$ , and F Test.

4. Create scatterplots of '2 Point %' vs. '2 Point Attempts' and '3 Point % vs. '3 Point Attempts'.
5. Create scatterplots of other variables that may be of interest to examine together and compare data across teams.
6. Based upon the visualizations created in Exercises 1-5, write a few paragraphs summarizing some features these data reveal about the teams' playing strategies and performance.  
*Note: Not necessary to write about every feature revealed in these data. Select a few themes to focus on that you would consider important and that can be communicated through these visualizations. Perhaps focus on certain teams or specific metrics to compare.*