

# Impact of a Superstar

NAME \_\_\_\_\_

Coaches and sportswriters always talk about the importance of playing as a team.

The 2004-05 Detroit Pistons are often credited as the epitome of the team concept, with no player trying to outperform his teammates. “We are a team that truly embodies what team is about. We’re unselfish,” said Piston Chauncey Billups.<sup>1</sup> Many credit the Pistons’ unselfish style as the reason they won the NBA Championship in 2005.

On the other hand, detractors have branded Kobe Bryant as a selfish, egotistic player who pads his own achievements at the expense of his team.<sup>2</sup> David M. Carter of the Sports Business Group consulting firm in Los Angeles said of Bryant, “There is no ‘I’ in team, but he makes you think there might be a bunch of ‘I’s’ in Kobe... to many, I think he personifies the current-day ballplayer — self-centered, greedy and coming across as having a sense of entitlement.”<sup>3</sup>



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In this activity, you will compare these two teams to see what impact a superstar player has on his team’s statistics.

Go to the **Illuminations** web site, <http://illuminations.nctm.org>.

- Select **Activities** from the top navigation bar or from the first button along the left side.
- On the search page, enter *line of best fit* in the Advanced Search box, and click the Search button.
- The resulting list will include the **Line of Best Fit** activity. Click on the link for this activity.
- Read the **Instructions**. Then, spend a few minutes familiarizing yourself with the tool before attempting the questions below.

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<sup>1</sup> McCosky, Chris. “Pistons Add Team Concept.” *The Detroit News*. Received 3 March 2006 from <http://www.detnews.com/apps/pbcs.dll/article?AID=/20060219/SPORTS0102/602190377/1127>.

<sup>2</sup> “Kobe Bryant.” Received on 3 March 2006 from <http://www.answers.com/topic/kobe-bryant>.

<sup>3</sup> Dupree, David. “Like It Or Not, Kobe Bryant Shines.” *USA Today*. Received on 3 March 2006 from [http://www.usatoday.com/sports/basketball/allstar/2006-02-15-bonus-cover-kobe\\_x.htm](http://www.usatoday.com/sports/basketball/allstar/2006-02-15-bonus-cover-kobe_x.htm).

The following tables show only those players who, on average, played more than 20 minutes per game. Roughly speaking, these players would be considered the “starters” on each team.

### Los Angeles Lakers, 2004-05

PLAYER	GAMES	POINTS	MINUTES
Kobe Bryant	66	1819	2689
Caron Butler	77	1195	2746
Chucky Atkins	82	1115	2903
Lamar Odom	64	975	2320
Chris Mihm	75	735	1870
Jumaine Jones	76	577	1830

### Detroit Pistons, 2004-05

PLAYER	GAMES	POINTS	MINUTES
Tayshaun Prince	82	1206	3039
Richard Hamilton	76	1424	2926
Chauncey Billups	80	1316	2866
Rasheed Wallace	79	1145	2687
Ben Wallace	74	721	2671
Antonio McDyess	77	740	1797
Carlos Arroyo	70	461	1448

- Using the data for Kobe Bryant, enter points along the horizontal axis and minutes along the vertical axis. (To plot this data, you can enter **1819, 2689** in the text box and click the Update Plot button.) Plot the same data for the other players on the Lakers. After all of the data is plotted, describe any patterns that you notice.
- Click the **Student Guess** button, and move the green dots until the line approximates the data.
  - What is the slope of your line? What does the slope of your line represent?
  - What is the y-intercept of your line? What does the y-intercept represent?
- Click the **Computer Fit** button. The computer will calculate the equation for a line of best fit, and a red line will appear on the graph. How does the equation of your green line compare to the equation for the red line of best fit?

At this point, you may wish to un-check the **Student Guess** button to remove the green line from the graph.

4. The  $r$ -value that appears with the Computer Fit is the *correlation coefficient*. The absolute value of  $r$  indicates how well the line of best fit approximates the data. If  $|r| = 1$ , the line of best fit perfectly approximates the data. If  $|r| = 0$ , the line of best fit is a very poor approximation of the data.

What is the  $r$ -value for the line of best fit that approximates the data for the Lakers? Explain what this value means in regards to the data entered.

5. Remove the data for Kobe Bryant from the text box, and then click the Update Plot button.

- a. How does the line of best fit change?

- b. How does the  $r$ -value change?

- c. Explain the changes to the line of best fit and  $r$ -value in the context of this problem. That is, how do the points and minutes of Kobe Bryant compare to the rest of the players on the Lakers?

6. Replace the data for Kobe Bryant in the text box, remove the data for a different player, and hit the Update Plot button. Take note of any changes that occur. Repeat this process for each of the other player's, removing their data one at a time. Does the removal of data for other players have the same effect as the removal of the data for Bryant?
- How do the line of best fit and  $r$ -value change for the other players?
  - Do these results suggest that Kobe Bryant is “selfish,” as some sportswriters have claimed? What other conclusion might be drawn from these results?
  - For which set of data is the line of fit better—the set of data for all six Lakers, or the set of data for the five Lakers besides Kobe Bryant? Explain your answer.
7. Repeat this procedure using the data for the Detroit Pistons. First, find the line of best fit using the data for all seven players. Then, take turns removing the data for just one of the players. Explain any patterns that you notice. How are the results similar to or different from the results for the Lakers? Is there a “selfish” player on the Pistons?