Points Per Shot (PPS) Activity

Rondae Hollis-Jefferson, Shooting Guard and Small Forward for the Brooklyn Nets, showed how a player's Points Per Shot (PPS) is calculated. While attempting 10 field goals, Rondae made seven 2-pointers for 14 points, and he made two 3-pointers for 6 points. All together, his shots totaled 20 points. To determine his Points Per Shot, those 20 points were divided by his 10 field goal attempts. His PPS was 2.0.

From Careers that Count: A Virtual Field Trip with the NBA

We all know that shooting around in an open gym is much different from a live game with top defenders, a roaring crowd, and four quarters of intense play. Let's look at an entire season's data and determine some Points Per Shot stats.

The following table, from Discovery Education Math Techbook's NBA Analysis Tool, contains real data from some of the NBA's most popular players. Can you calculate each player's PPS stat? Write a formula that could be used to determine each player's Points Per Shot.

EXTENSION: Create your own data set as an individual or class activity. Have each participant take the same number of shots (10, 20, etc.), and have observers record the number of 2-pointers and 3-pointers made. Calculate each player's Points Per Shot. Alternatively, calculate the PPS for NBA or WNBA players on your favorite team using the NBA Analysis Tool in Discovery Education Math Techbook.

QUESTION TO PONDER: Setting aside player skill level, what factors or variables might impact a player's Points Per Shot statistic?

NBA Analysis

Stats | Player | Team

All Players > Player Comparison   All Time Leaders ▾   Compare List (10)

Formula: [   ]   ?   Choose Stats ◉

	A	B	C	D	E	F	G
1	Player	FGA	2PM	3PM			
2	Brandon Ingram	670	216	55			
3	Buddy Hield	752	174	146			
4	Domantas Sabonis	473	140	51			
5	Dragan Bender	161	29	28			
6	Jakob Poeltl	112	64	0			
7	Jamal Murray	713	174	111			
8	Jaylen Brown	413	141	46			
9	Kris Dunn	300	92	21			
10	Marquese Chriss	632	212	72			
11	Thon Maker	173	52	28			

Table Key: FGA = Field Goals Attempted, 2PM = Two Pointers Made, and 3PM — Three Pointers Made

Effective Field Goal Percentage Activity

Zain Jafri, Analyst for the New York Knicks, shared that Effective Field Goal Percentage (eFG%) can be a more accurate measure of a shooter's impact. Why? Because it accounts for the fact that, even though 3-pointers are made less often, they're worth more than 2-pointers.

The formula for determining Effective Field Goal Percentage is:

$$eFG\% = \frac{FGM + 0.5 \cdot 3PT}{FGA}$$

The table from Discovery Education Math Techbook's NBA Analysis Tool, contains the data you need to calculate the Effective Field Goal Percentage for each player on the Los Angeles Sparks, including Nneka Ogwumike, 2016 WNBA Most Valuable Player. What is each player's eFG%?

EXTENSION: How does each player's Effective Field Goal Percentage compare to her general Field Goal Percentage? What does this tell us about the player and the position she plays?

QUESTION TO PONDER: What's the difference between the formulas for Effective Field Goal Percentage and True Shooting Percentage (TSP)? Research each statistic, then compare.

NBA Analysis

Stats · Player · Team

All Players > Player Comparison · All Time Leaders · Compare List (12)

Formula:

Choose Stats

	A	B	C	D	E	F	G	H
1	Player	FGM	FGA	3PM				
2	Alana Beard	100	214	13				
3	Evgeniia Belyakova	16	54	5				
4	Essence Carson	102	227	23				
5	Ana Dabovic	20	54	3				
6	Jelena Dubljevic	9	22	1				
7	Chelsea Gray	71	157	14				
8	Sandrine Gruda	3	9	0				
9	Jantel Lavender	150	279	0				
10	Nneka Ogwumike	244	367	16				
11	Candace Parker	190	430	42				
12	Kristi Toliver	142	333	81				
13	Ann Wauters	12	22	0				

Table Key: FGM = Field Goals Made, FGA = Field Goals Attempted, and 3PM = Three Pointers Made

Scheduling Activity

Hao Meng, Director of Basketball Strategy for the NBA, shared some of the complexities of scheduling all 1,230 games in the NBA season. What does this scheduling actually feel like? Let's take into account just one variable: distance between destinations.

The Brooklyn Nets compete in the NBA's Eastern Conference. Throughout the season, they play teams in the Eastern and Western Conferences. To help minimize player fatigue and, in many cases, cost of travel, it is helpful to keep travel distances to a minimum.

In this part of their away-game schedule, the Nets need to travel to play the Charlotte Hornets, the Toronto Raptors, the Detroit Pistons, and the Indiana Pacers before returning home to Brooklyn. What is the shortest possible travel route for them to take? The table below represents distances between cities in miles.

Create a partial schedule for the Nets to play each of these four teams and then return home. Try to minimize total travel distance. Is the combined distance for your schedule as few miles as possible? How do you know?

EXTENSION: Doris Daif, Senior Vice President of Customer Data Strategy for the NBA, shared that they use fan data to create compelling and personalized messages. Compose a tweet or email promoting these road games. Who is your target audience? What do you want them to know?

QUESTION TO PONDER: This scheduling exercise is a variation on what's known as the Travelling Salesman Problem, an unsolved problem in mathematics. What algorithms exist to help solve the Travelling Salesman Problem? What do you think this says about creating a "perfect" NBA schedule?

Five cities:
Toronto (TOR)
Brooklyn (BKY)
Charlotte (CHA)
Indianapolis (IND)
Detroit (DET)