

## Who had the Best NBA Season Ever?

The table below gives statistics from one of the most productive seasons of some of the greatest basketball players ever to play the game. A little background info:

- Points are points scored by that player.
- An assist is when a player passes the ball to the player who scores, often setting them up for a good scoring opportunity.
- A rebound is when the player gets the ball off of a missed shot attempt, thus giving his team possession and another scoring opportunity.
- A steal means that the player legally took the ball away from a player on the other team, thus giving his team possession and another scoring opportunity.
- A block means that the player swatted away a shot by the other team, usually giving possession to his own team.
- A turnover is when the player gives up the ball to the other team, giving the other team possession and a chance to score.

Based on data below, which player do you think had the most productive season? Another way of thinking about this is which player either produced or had a part in the most points for his team? How do you determine the most productive season?

Player and Season	Points per Game	Assists per Game	Rebounds per Game	Steals per Game	Blocks per Game	Turnovers per Game
<b>Bird 87-88</b>	29.9	6.1	9.2	1.8	0.9	3.2
<b>Bryant 05-06</b>	35.4	4.5	5.3	1.8	0.4	3.1
<b>Harden 18-19</b>	36.1	7.5	6.6	2.0	0.7	5.0
<b>James 12-13</b>	26.8	7.3	8.0	1.7	1.1	3.0
<b>Johnson 88-89</b>	22.5	12.8	7.9	1.8	0.3	4.1
<b>Jordan 86-87</b>	37.1	4.6	5.2	2.9	1.5	3.3
<b>O'Neal 99-00</b>	29.7	3.8	13.6	0.5	3.0	2.8
<b>Olajuwon 92-93</b>	26.1	3.5	13.0	1.8	4.2	3.2
<b>Westbrook 16-17</b>	31.6	10.4	10.7	1.6	0.4	5.4

One way to consider which player had the most productive season is to give a mathematical value to each statistic. Being a life long sports fan, basketball fanatic and a mathematician, I have put together an informal (not perfect at all but useful) way to quantify total offensive production for their teams.

- Points are worth exactly what they are worth. If a player averages 30 points a game that produces 30 points a game for the team.
- Assists are worth 2.1 points each. The rationale: an assist leads to a score. Most scores are two point plays, but around 10% of scores are three point plays. So each assist is worth 2.1 points, because if you averaged out ten scoring plays you would have 21 points, 9 two pointers and 1 three point play. That averages out to 2.1 points per play.
- Rebounds are worth 1.05 points each. The rationale: similar to the logic of an assist, but a rebound only leads to a score around 50% of the time, so instead of 2.1 points per rebound it would be half that or 1.05 points.
- Steals are worth 1.05 points each. Same logic as rebounds.
- Blocks are worth 1.05 points each. Same logic as rebounds and steals.
- Turnovers are worth -1.05 points each. That is right, negative points. When committing a turnover you are giving the ball back to the other team and they will score about half the time.
- All of these values added together compute the total offensive production value per game of a player.

1. Use the mathematical values for each statistic to determine which of the players in the table had the most productive season. Be sure to show all of your thinking and work below.

Player	Points	Assists	Rebounds	Steals	Blocks	Turnovers	Total Value
<b>Bird 87-88</b>	29.9	6.1	9.2	1.8	0.9	3.2	
<b>Bryant 05-06</b>	35.4	4.5	5.3	1.8	0.4	3.1	
<b>Harden 18-19</b>	36.1	7.5	6.6	2.0	0.7	5.0	
<b>James 12-13</b>	26.8	7.3	8.0	1.7	1.1	3.0	
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<b>O'Neal 99-00</b>	29.7	3.8	13.6	0.5	3.0	2.8	
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2. Rank the players' seasons from 1 to 9 below. Who had the most productive (or maybe valuable) season? Was this the same player that you originally thought it would be?

3. Write a formula that gives the total offensive production for any player given a player's  $p$  points,  $a$  assists,  $r$  rebounds,  $b$  blocks,  $s$  steals and  $t$  turnovers. Is there more than one way to write this formula?

4. As I admitted earlier in the activity, this formula is not perfect. How would you change the formula to better represent total offensive production by a player? Or, how might you tweak the formula a little to make a different player (say one of your favorite players) have a greater total offensive production value?

5. Extension: Research other past or present NBA players at <http://www.basketball-reference.com/>. Use this formula to find the total offensive production value of other players. Can you find a player whose production tops any of the players mentioned in this activity?

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Reference: <http://www.basketball-reference.com/>