



# HOT SHOOTERS!

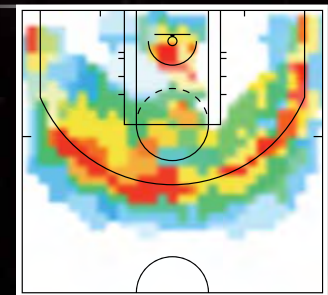
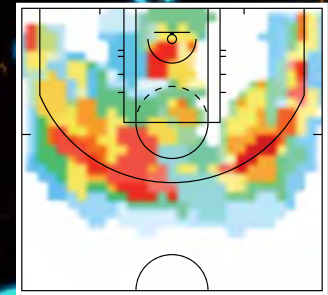
Today, some basketball stats are adding up to more than just numbers—they're now being translated into visuals that players can use to improve their game. A great example of this is the heat (or heat zone) map.

Information about thousands of shots is entered into a computer. The data are based on the location of shooting attempts and their success rate. The computer uses the information to produce a color-coded map of the court that shows the success of the various shooting positions, with red representing the spots where a player is most successful (in other words, where the player is a "hot shooter!") and blue representing where a player is least successful.



## Heat Zone Maps

These heat zone maps show the most and least successful areas of the court where two different players have made shots. Find the places where the shooter being measured is really good and where the player is "colder." You can see that a lot of shots are taken on or close to the three-point line.



## SCIENCE STUFF

Technology is becoming a bigger player in basketball. Some teams and colleges (and even players, using their own apps) are now using shot-tracking technology. Sensors can go in shoes, basketballs, and in the rafters of the arena to track every movement the players make and note when and where shots are taken. The data are gathered into statistical and visual presentations that can be studied by coaches and players to continually improve skill and the game.





# STAT CITY



**B**asketball athletes are supertalented, and it's fun to watch them show off their skills. But to really dive into hoops, you need to know the stats. How do teams, players, and fans keep track of who did what? What are the key statistics to know? What are the statistics of the future? Being tall, fast, athletic, and hardworking can help a basketball player become a superstar. Understanding basketball math and numbers can help you become the ultimate hoops fan!

### HISTORY BY THE NUMBERS

Though computers and tablets are essential for tracking stats in today's pro and college basketball scene, some scorekeepers still start with an old-school No. 2 pencil. They keep track of information on paper charts like this one and then transfer the answers into computer programs and spreadsheets.

# THE ABCS OF PPG

Here's the deal: Instead of yearly totals, the NBA uses per-game averages to determine the scoring leader. But how do the scorekeepers get these numbers? Time for a calculator! They take the total number of points a player scored during a season and divide by the number of games played. The result is the average number of points a player scored in each of his or her games. That is how the NBA figures out its scoring champ. The same is true for all of the counting stats, from rebounds to blocks. It's what you average per game that really counts, not the total score for the season.

**points**  
÷  
**games**

---

**average**



**1/ Who is the NBA's ALL-TIME leader in points per game?**

- a. Player A with 32,292 points in 1,072 games
- b. Player B with 38,387 points in 1,560 games

**Use the same method to answer these other questions:**

**2/ Who had the most career assists per game?**

- a. Player C with 15,806 assists in 1,504 games
- b. Player D with 10,141 assists in 906 games

**3/ Who had the highest blocks-per-game average in NBA history?**

- a. Player E with 1,830 blocks in 1,238 games
- b. Player F with 3,064 blocks in 875 games

**4/ Who is No. 1 in points-per-game scoring in WNBA history?**

- a. Player G with 8,472 points in 427 games
- b. Player H with 2,601 points in 124 games

Answers: 1/ a. Player A (30.12), 2/ b. Player D (11.19), 3/ b. Player F (3.50), 4/ b. Player H (20.98)



**COMING THIS FALL!**

**AVAILABLE WHEREVER BOOKS ARE SOLD**

*Some content may have been modified for purposes of this activity sheet.*

© 2020 National Geographic Partners, LLC

# TEST YOUR SMARTS!

Now that you understand how to calculate PPG (points per game), try out some of these word problems:

**1/**Penelope is a point guard for the fictional Mars Mavericks. Over the 92 games she played this year, Penelope scored 1,152 points. Dolly is a point guard for the fictional Saturn Slayers. She played 80 games this year and scored 998 points. Who has the higher PPG?

**2/**Andre plays power forward for the fictional Jupiter Jayhawks. He has blocked 908 times in 430 games. Sonny, who plays small forward for the fictional Pluto Pollywogs, has blocked 1,341 times during 600 games. Who has the higher blocks per game?

**3/**Marta plays for the Neptune and has 13.5 PPG for this year after playing 94 games. How many points did she score? (Hint: For this one, you have to multiply the PPG by the number of games to get the amount of points Marta scored.)

**4/**In 2017, Marta had 480 blocks and a blocks per game of 4. How many games did Marta play in 2017? (Hint: For this, you need to divide the number of blocks with the number of blocks per game.)

**5/**Brittney played 33 games in the 2018 season and scored 688 points. What is her PPG?

**6/**Bradley has a 25.6 PPG for the 2018–2019 season and played 82 games. About how many points has he scored? Round to the nearest whole number.

**7/**James has played 826 games in his entire career. He has a PPG of 25.1 as of the end of the 2018-19 season. About how many points has he scored? Round down to the nearest whole number.

Answers: 1) Penelope has 12.52 PPG, and Dolly has 12.48 PPG. 2) Andre has 2.11 blocks per game and Sonny has 2.24 blocks per game. 3) Marta scored 1,269 points this year. 4) Marta played 120 games in 2017. 5) Her PPG is 20.84. 6) Bradley has 2,099 points. 7) James has 20,733 points.



COMING THIS FALL!

AVAILABLE WHEREVER BOOKS ARE SOLD

Some content may have been modified for purposes of this activity sheet.

© 2020 National Geographic Partners, LLC

# PERCENTAGE PARTICULARS

Another way to track stats is by using percentages. A percentage is a number that can reveal how often something happens. For example, if you take 10 shots and 5 of them go in, you made 50 percent of your shots. To get this number, you divide the portion of shots that were made by the whole number of attempts. So, 5 divided by 10 equals 0.5. Multiply that number by 100 and, ta-da, you get 50 percent.

More math? Yes, please! Let's see how you do in figuring out these NBA single-season records.

We did the first one for you as the tip-off.

$$\frac{2,129 \text{ (shots made)}}{4,880 \text{ (shots attempted)}}$$

0.436

$$\times 100$$

43.6%

1/Who had the best shooting percentage for a single season?

- a. Will 586 attempts, 426 made
- b. Tamika 193 attempts, 129 made?

2/Who had the best free-throw percentage for a single season?

- a. Jose 154 attempts, 151 made
- b. Becky 35 attempts, 35 made

3/Who had the best three-point percentage for a single season?

- a. Kyle 110 attempts, 59 made
- b. Jessie 64 attempts, 34 made



Answers: 1/ a.Will (72.6%), 2/ b.Becky (100%), 3/ b.Kyle (53.6%).



COMING THIS FALL!

AVAILABLE WHEREVER BOOKS ARE SOLD

Some content may have been modified for purposes of this activity sheet.

© 2020 National Geographic Partners, LLC





**TRY THIS!**

**Put on your striped shirt,** pick up your whistle, and loosen up your fingers. It's time to "Be the Ref!" for a big college game.

First, study the chart shown here. See how a ref uses different fingers and hands to show player uniform numbers? After you've become familiar with the hand signals for each number and practiced, it's time to play Be the Ref!

Gather a few friends to start the game. Perhaps you can go head-to-head with one of them. Have one pal say a number between 1 and 99. Remember, since this is a college game, the numbers 6, 7, 8, and 9 aren't allowed. Your friend can throw in some trick numbers that use these digits, but you have to yell out "Trick number!" before saying the number. See how fast you can move your fingers to signal the number called ... or how fast you can blow the whistle and shout "Trick number!"

Check out these examples of signals for different numbers.

