



Curiosity Guide #405

Basketball Science

Accompanies Curious Crew, Season 4, Episode 5 (#405)

Basketball Information

Description

Check out this sheet of super-duper scientific basketball information!

Why is air pressure important, and how does it work? The air molecules that are in the ball are constantly in motion as they collide with each other and the wall of the ball. The more molecules there are, the more frequently the molecules hit each other and the ball. This is what we call pressure. When the air molecules are heated up, they move faster and increase the pressure in the ball. When the air molecules are cooled down, the molecules move more slowly, hitting each other and the wall of the ball less often and with less force. As a result, the ball seems "flat" and will not bounce back as well. Keeping a basketball in a hot car increases the air pressure and makes the ball too bouncy. Leaving the ball outside on a winter day isn't good, either, because the ball will feel flat when you want to use it.

Balls don't go through bodies! Sometimes you need to pass the ball to a teammate, but there is a defender in the way. Try bounce-passing the ball around someone by adding spin to the ball. Throw the ball to the right of the defender so that the ball will hit bounce off the floor. When you release the ball, slide your right hand up the right side of the ball, and slide your left hand down the left side of the ball. The ball will now have a top spin that rotates the ball hard to the left. When the ball hits the floor, the floor pushes sideways and upwards on the ball. Because the ball is spinning when the ball hits the floor, it changes the angle of the bounce and the ball will hook to the left.

Why do you think the basketball has all those dimples? This feature is called pebbling. The first balls were so smooth and slippery that they were hard to grip. Ball engineers created a solution to the problem by adding little bumps all over the ball, which increased the total surface area of the ball. That allows more friction with your fingers and makes palming the basketball possible, even if your hands aren't as large as a professional player's hands.

Science and basketball are good buddies! Science is all around us, and certainly in the game of basketball. Speed and momentum are a part of shooting, passing, or dribbling. Combining direction with speed is called velocity, which we see in the parabola angle of a shot, the angle direction of a pass, or the ball's placement during the dribble of a pressurized ball. And the force of gravity is ever present, which challenges the players throughout the game, especially when jumping for that slam dunk. Basketball sure has come a long way since the smooth brown balls that were thrown with two hands into a nailed-up peach basket for 2 points! Remember, stay curious and keep experimenting!

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