Tennis Tests
Tennis Tests is part of the Smithsonian Science Stories™ Literacy Series. The books in this literacy series enhance and reinforce the science concepts taught in the Smithsonian Science for the Classroom™ curriculum modules.

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What does a sports engineer do? Let’s meet one and find out!
My name is James Spurr. I am a sports engineer.
I test the balls, rackets, and court surfaces used in the game of tennis.
RACKET TEST

I test tennis rackets to see how hard they hit the ball.
Some rackets push the ball harder. The ball moves faster.
Some rackets push the ball softer. The ball moves slower.
Many years ago, rackets did not push the ball as hard. Here is a tennis racket from 1960. It is made of wood.
Tennis rackets made of modern materials like aluminum push the ball harder.
What makes the best racket? Is it the racket that hits the ball the hardest?
It is not! When the ball goes too fast, the other player can’t hit the ball back.
The game is not as fun. The game is more fun when the other player can hit the ball back.
I test tennis rackets to see how hard they hit the ball. Here is the machine I use to test the rackets.
The machine spins the racket in a circle.
A ball drops down from here.
The spinning racket hits the ball.
The machine measures the speed of the ball.
COURT SURFACE TEST

I also test tennis court surfaces.
In tennis the ball bounces off a surface. This is called a collision.
When the ball collides with the surface, the ball gets pushed.
The ball changes direction. The ball changes speed.
There are different kinds of court surfaces. There are courts made of concrete.
There are courts made of clay. There are courts made of grass.
I test each surface. I measure how fast the ball moves after it collides with the surface. I label the surface as slow, medium, or fast.
Then tennis players know what to expect when they play on that surface.
Tennis is played in many countries. Different countries use different kinds of court surfaces. Players may get used to one kind.
They will know if the surface is slow, medium, or fast. Other players may not know. Testing the surfaces makes the game fair for all players.