

People have used advances in science and math to make sports safer for athletes. Science, technology, engineering and math are known as STEM –and STEM has a big impact on every sport that's played.

THE WIND-UP

A pitcher gets a larger **force** on the ball with a **wind-up**. The wind-up uses the largest parts of the body first to really put lots of **force** on the ball.



From a standing position, with the ball held high, the pitcher coils to start the chain reaction.

As he raises one leg bending at the knee, he lowers his throwing arm below his hips.

Now, gaining **momentum**, he strides forward and power moves through his body to his throwing arm, which rises to shoulder height behind him.

He rotates forward and with the energy generated by the movement, whips his arm forward as he releases the ball. The force of the action leaves him standing on one leg.

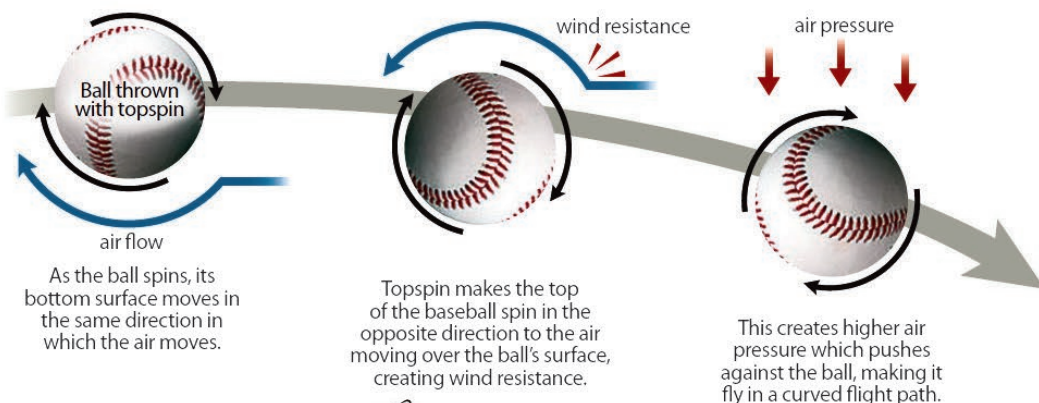
Does a curve ball actually curve?

For a long time people thought curve balls were an illusion. But, thanks to technology and a better understanding of physics, we now know that the ball

actually *does* curve – as much as 18 inches by a skilled pitcher.

A curve ball is very difficult to hit. A good pitcher can

make the baseball curve to the left or to the right or suddenly downward, leaving a frustrated batter swinging at nothing but air. *Steeeee-rrrrrike!*



FAST FACTOID: The fastest pitch on record was thrown by Aroldis Chapman in 2010. The ball was clocked at a stunning 105.1 mph (169.1 km.h). The catcher's hand is probably still a little sore.



Which pitch is which?

Pitchers can throw several different kinds of pitches to confuse the batter.



CUTTER

This pitch makes the ball curve away from the batter.



SPLITTER

This ball drops suddenly just before it reaches home plate.



SCREWBALL

This ball curves down and away from the batter.