

FUEL FOR THOUGHT

WHAT'S YOUR ANGLE?



A golf bag contains a variety of clubs. The face of each club has a different angle or slope to it. For long drives, it is best to use a club with a face that is only slightly angled, or nearly vertical. For higher, shorter shots a club with a more angled face is better.

HOW MUCH TO SPIN?

Fill in the blanks using these words.

lift farther distance longer
backwards friction enough stop
slows control aerodynamics
resistance hole right ball

For a long drive, a golfer needs to understand _____ to get just the right amount of backspin. Spin creates _____, so the ball stays in the air _____. That's thanks to _____!



With more hang time, the ball travels _____. Too little spin, and the _____ doesn't lift enough to travel down the fairway.

However, too much spin increases the wind _____, which makes the ball slow

in the air. When the ball _____ down too much, it falls down. Getting just the _____ amount of spin is important to make sure the ball will reach the maximum _____.

WHAT A SPIN!

For short hits on to the green, more spin can _____ the ball. If the ball doesn't spin _____, it can bounce and roll too far. With a lot of spin, the ball can actually roll _____.

Controlling spin lets players control where the ball will _____, so that they can get the ball close to or in the _____.

Time Capsule

Gather STEM related articles from today's newspaper to place in a time capsule. What do the articles tell us about our current technology?

Scientist's Notebook

A special machine at the USGA Test Center shoots a golf ball out of a gun through a tunnel toward an angled target. A camera uses video and slow motion photography to observe and measure the spin. Golf ball manufacturers want to know how a ball's construction affects its spins.

Q: Does hitting a more steeply angled surface cause a ball to spin more?

The data below illustrates actual USGA Test Center results for a test that measures a golf ball's spin speed when it hits different angled surfaces at 55 miles per hour.

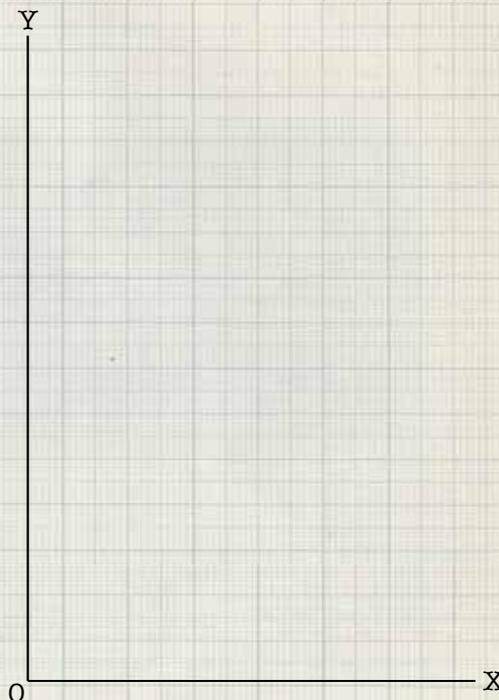
ANGLE (degree)	Spin (RPM)
10	1100
20	2300
30	4000
40	6000
50	7200
60	7500

RPM is Revolutions Per Minute. This is the term used to describe spin speed.

Graph It!

It's your turn to be an engineer and record the results on a bar chart. Follow these steps:

- From the "0" point, create six evenly spaced intervals along the **X** axis. Label the intervals from 10 to 60. Name the **X** axis "ANGLE."
- From the "0" point, create eight evenly spaced intervals along the **Y** axis. Label the intervals from 1000 to 8000. Name the **Y** axis "SPIN."
- Begin with the 10 degree angle and draw a bar to approximately the 1100 point.
- Continue to fill in the angle/spin data.



STEM Connection: To do well in a game of golf, a golfer wants to control the speed and direction of the golf ball. The spin of a golf ball affects its speed and direction. Different angled clubs will produce different results.