

The Best Launch Angle

What is this about?

If you want to hit a homerun, you certainly want to hit the ball as hard as possible, but what angle should you launch it for the greatest distance? Do you think the best launch angle for the baseball is 45° ? Is it more or less?

What do I need?

You need a projectile launch that allows you to vary the angle and keep the launch speed the same such as Sargent-Welch (product number WLS1764-11).



What will I be doing?

You will launch the ball at different angles, but the same speed, to find out what angle makes them go the farthest.

What do I think will happen?

Take a minute and write down a description of what you think will happen and why you think it. What is the best launch angle?

What really happened?

Launch the ball at different angles and record the distance they go. Make sure that:

1. They are launched at the same speed every time (the plunger is pulled back the same amount)
2. They land at the same height they are launched from.
3. Launch several shots from the same angle to check the consistency of the shots.

Write a description of your results. What was the best launch angle?

What did I learn?

The best launch angle of a homer would seem to be 45° . What is the effect of air resistance? Have you noticed that a gentle stream of water from a hose travels furthest if the hose is aimed at 45° above the horizontal? What happens if you open up the tap and speed up the water? Give it a try! You'll probably notice that angle for the water to go the furthest gets smaller as the water goes faster. When a projectile feels the effects of the air, the best launch angle is less than 45° .

What else should I think about?

Is a well hit baseball affected by air resistance? The air around us feels very thin, but to a baseball in flight, the air feels very differently. You can test this by putting your hand out the window of a car moving at highway speeds. The air feels surprisingly thick and exerts strong forces on your hand. The same force acts on the speeding baseball. It is called "air drag" and it acts opposite to the motion of the ball. Go look at the video of some homers. You'll notice that they are almost always hit at angles less than 45° .