

# The relationship between air pressure of a soccer ball and the distance it travels.

## Introduction

This experiment is to test the theory, of whether the air pressure affects the distance a soccer ball travels after being kicked.



## References and acknowledgements

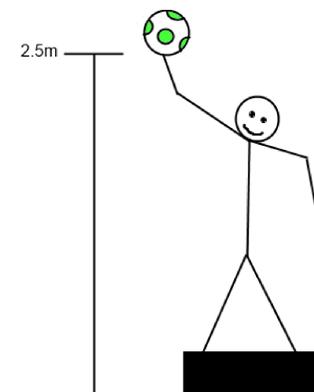
<http://www.livestrong.com/article/412822-how-does-the-air-pressure-of-a-soccer-ball-affect-the-distance-it-goes-when-kicked/>  
By ROGUE PARRISH Last Updated: Jun 24, 2015  
In the example of a kick traveling 30 meters per second, the force is 270 Newtons  
By Tabatha Smith 05/22/2010  
<http://www.livestrong.com/article/441962-how-much-force-does-an-average-soccer-player-kick-the-ball-with/>  
by ROGUE PARRISH Last Updated: Apr 23, 2015  
<http://www.mademan.com/mm/how-does-air-pressure-affect-soccer-ball-flight.html>

## Methodology

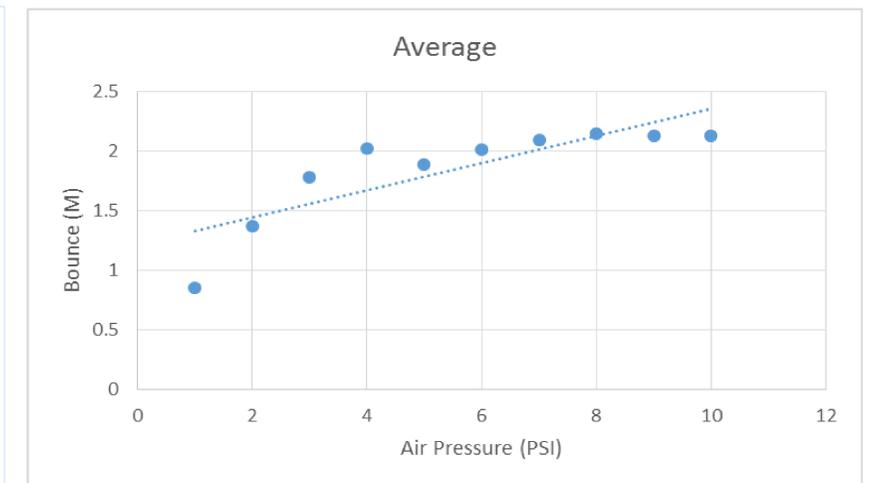
Materials:

- 3 soccer balls at the same size and the brand.
- Measuring tap/ruler
- ball pump
- Air pressure gauge/pump
- Ladder
- Video camera
- Computer, with logger pro program

1. Vertically Stick a 1 meter ruler in the cameras view, also mark out 2.5 meters on the wall..  
And stand on an object so you can reach 2.5 meters, in the cameras view.  
(As shown in the diagram)
2. Have a video camera set up to capture all of the measurements on the wall.
3. Stand on the object so you can reach 2.5 Meters
4. Drop three different balls from that 2.5 meters and recorded the bounce of each time ball.
5. Then analyse by using logger pro on your computer.
6. Repeat steps 3 & 4 for set of different air pressures



## Results



## Discussion

A soccer player applies 270 newtons of force to a soccer ball to get it to travel at 60 mph or 96.5 km/h , to replicate the same amount of force applied by the ground a soccer ball would have to be dropped from 45 meters off the ground. Due to this difficulty of getting to this height, I dropped the ball from 2.5 meters which we still allow us to calculate the rebound of the ball difference of different air pressures of the soccer balls. The trend lines have a strong linear relationship, as the air pressure increases so does the bounce of the ball. The data does show a slight decrease in rebound after 10 PSI and upwards to 14 PSI. which this does support the recommended PSI range of the ball which is 7-9 PSI.

## Conclusion

The data collected shows the relationship between air pressure and distance travelled by a soccer ball that is that Air pressures below the recommended PSI have a lower rebound, the recommended PSI of 7-9 the rebound got higher. After the recommended Air Pressure there was a slight decrease in the height of the rebound.

From this experiment, further investigation might include the effect of too much air pressure on the rebound of the ball, the change in mass as the air pressure increases or the different rebounds of different brands and sizes of soccer balls.