Testing soccer ball pressures

Hypothesis

I think that the pressure in a soccer ball has an effect on how far the ball goes when kicked. I think a ball with medium pressure will go the most distance because there is an ideal pressure between high and low air pressures.

Research

Source 1:
https://www.thefa.com/football-rules-governance/lawsandrules/laws/football-11-11/law-2---the-ball

Fifa rules say that a pressure of a soccer ball is equal to 0.6 – 1.1 atmosphere (600 – 1,100g/cm2) at sea level (8.5 lbs/sq in – 15.6 lbs/sq in)

Source 2:https://learn.weatherstem.com/modules/learn/lessons/82/10.html

As temperature increases the pressure inside of a soccer ball also increases. You are going to have to check weather conditions to see the balls air amount is the same.

Source 3: https://learn.weatherstem.com/modules/learn/lessons/82/09.html

When the weather is cold air the ball will go less distance than the warm air, because their is less drag when there is warmer air instead of colder air.

Procedure

I will gather supplies to build a kicking machine because it is the same amount of force every time. I will select a testing field and test if there is a certain amount of numbers that stay the same or near the same with the psi/ pound per square inch if we are using the same amonut of force. I selected two soccer balls to use for my test. I gathered instruments to take measurements. Instruments included a rolling yardstick, and a precise pressure gauge,and a thermometer. A data table was created to record testing data. before the test began a temperature reading was taken. The next step was to install the kicking machine at the selected location. The next step was to air the balls up to minimum test pressure of seven psi. The balls where kicked with the kicking machine repeatedly and distance measurements were recorded in the data table. The ball pressure was increased in one psi (pounds per square inch) steps and distance measurements where taken. Maximum test pressure was twelve psi

Materials

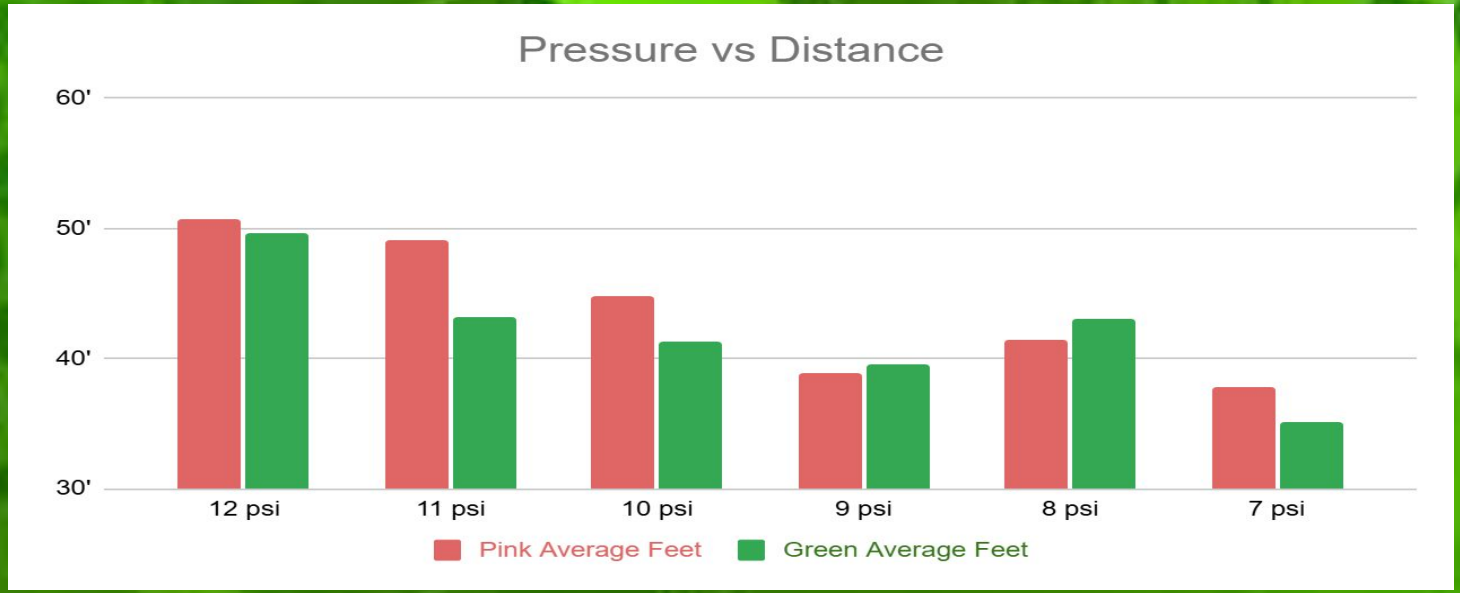
Get supplies including soccer balls, air pressure pump, Pressure gauge, thermometer for air temperature, spring and other materials to make kicking machine, and a tape measure, and a place to collect data, and a field to kick on.

Variables

The variables to control are pressure of the ball and kicking force. To control these variables an accurate pressure gauge was used and the kicking machine provided repeatable kicking force.

Observations

Observations were made for ball pressure and kick distance. An observation made during the testing was that the ball was unpredictable in rolling direction. Because of the uneven grass on the field



Experiment Setup

My experiment in live action

Conclusion

Looking at the graph of the data taken it would appear that higher pressure means longer distance. My original hypothesis was that that a ball with medium pressure will go the most distance because there is an ideal pressure between high and low air pressures. Based on the data observed, my hypothesis was wrong.

Abstract

I chose doing this project because it involves kicking a soccer ball and i am a soccer player. My original hypothesis was that a ball with medium pressure will go the most distance because there is an ideal pressure between high and low air pressures. I tested and recored my data on distances and pressures using my tool that I made that kicks the soccer ball and I measures the distances at different ball pressures. What I learned from this experiment is that higher ball pressures lead to higher kick distances. As a soccer player I know that if i keep my ball pressure higher it will go further in a game.