

Experiment 2.3: Centripetal Force

Data:

When I pulled on the string, the bag containing the ball moved in the direction of my pull.

When I twirled the ball and bag on the string above my head, it travelled in a circle. The faster I twirled the bag and ball, the tighter the string got.

When I let go, the bag, ball, and string went flying away from me.

Summary:

In this experiment, I put a baseball in a strong plastic bag and then tied the bag closed with a strong string that was about 20 inches long. I laid the system out on the floor and stretched the string so it was mostly straight. I put one hand on the floor and held the free end of the string with my other hand. When I pulled on the string, the ball and bag moved towards my hand that was on the floor.

Then I went outside and wrapped the free end of the string around my finger a couple of times. Then I held the string to my finger with my thumb. I twirled the system so the ball and bag spun above my head. I then released the string that was being held to my finger and watched what happened.

Conclusion:

The string allowed me to exert a force on the ball and bag. When the ball and bag were motionless, the force caused the ball and bag to move in the same direction. When I spun the ball and bag, however, the force that the string exerted didn't pull them towards me. Instead, it just kept them moving around me. When I let go of the string, it could no longer exert a force, and the ball and bag moved away from me. In that situation, the string exerted a centripetal force. It couldn't pull the ball closer to me, but it could keep it from moving farther away.