

Experiment 1.3: Motion in a Circle

Data

When I moved the bowl correctly, the marble started traveling in a circle along the inside edge of the bowl.

When I stopped moving the glass bowl, the marble continued to move in the same circle, but it moved more and more slowly until it stopped.

When I got the marble traveling in a circle again, stopped the bowl, and lifted it up, the marble stopped moving in a circle and started moving in a straight line away from the bowl. This happened every time.

Summary

I put a marble on the floor and then put a glass bowl upside down over the marble. I then started moving the bowl so that I got the marble traveling in a circle along the inside edge of the bowl. I stopped moving the bowl and observed what happened to the marble. Then, I got the marble moving in a circle along the edge of the bowl again, stopped the bowl, and lifted the bowl. I then observed the motion of the marble. I repeated that twice more.

Conclusion

The marble moved in a circle while under the bowl because the bowl exerted a force on the marble, which continually changed the marble's direction (and thus velocity). As long as the bowl could exert the force, the marble traveled in a circle. When I lifted the bowl, it could no longer exert a force on the marble, so the marble's velocity could no longer change. Thus, it started moving in a straight line, which means its direction (and thus velocity) no longer changed.