

# BOTTLE FLIPPING

Kiana Ashouri

Supervisor: Dr. Hossein Salari

Farzanegan 7 High School, Tehran/Iran

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## 1-Introduction

Water bottle flipping involves taking a plastic water bottle that is partially empty and throwing it so that it lands up right. First of all, some principals and rules of physics which effect on the water bottle movement were studied, then we started to do this challenge and compared our different results from different volumes of water. At last according to the results we got, the most success we gained was between 30% to 35% water filled.

## 2- Experiments and Results

First of all, some physical rules such as center of mass, gravity, and angular momentum which were the foundation of our project were studied. The second step was checking out the water behavior in different situation. In fact, all the variables were kept fixed except the volume of the water which were 5%, 25%, 30%, 33%, 35% and 70% filled.

The bottle was thrown 6 times with different volumes of water and the most success was for 30% and 33% filled that the bottle land upright about 5 times. All were shown by high speed camera and different behavior of the water in 30% and 33% was totally obvious so that water turned into a crescent and on the sides of the bottle the amount of the water was equal it was balanced.

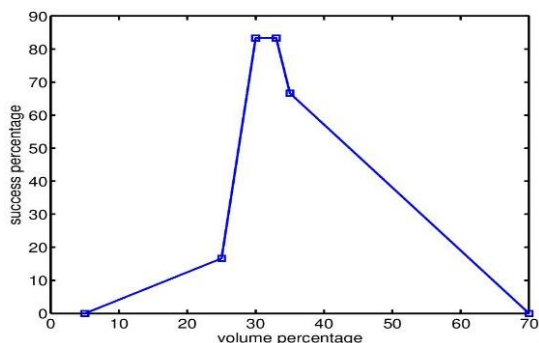


Figure 1- Success versus volume of water

## References

1-Fundamentals of physics book by David Halliday, Robert Resnick, Jearl Walker

2-Analytical Mechanics by cassiday and fowles