

Week 4 or 5 : Uniform Circular Motion

In lab, you'll be able to explore 2-dimensional motion using the twirl-a-bob. ***Caution: Please be careful when you swing the nut around in a circle! Make sure you don't hit your fellow students!***

1. To learn how to use the twirl-a-bob takes a little practice. Start by putting about 40 g of weight into the basket attached to the string. Hold the white PVC pipe vertically and get the nut to swing in a circle. Observe what happens when you twirl the nut faster or more slowly, and write your observation down.
2. Your task is: to find a relationship between the total weight hanging from the string (basket plus weights in it) and the period of rotation of the nut.

Devise an experimental procedure: that allows you to figure out this relationship.

Remember that while you change one variable, you'll have to keep all other parameters constant. You should keep the length of the string from the nut to the top of the PVC pipe to 60 cm, by making a mark on the string. We recommend that you adjust the speed at which you whirl the nut, such that the basket rises up until this mark is at the bottom of the PVC pipe and stays there. Vary the mass from about 35 gr to about 110 gr.

3. Make a data table, and have the instructor approve it before you start taking data.
4. Put your data on the board.
5. We'll work out the theory together on the board.
6. Plot your data in such a way that you are getting a straight line. What is the meaning of the slope of the line?