

Uniform Circular Motion Lab

Objective: Study the relationship between Linear Velocity (v), Centripetal Acceleration (a_c), and Centripetal Force (F_c).

Tools/Materials:

CBL Calculator w/Easy Data Application

Force Probe (with hook attachment)

Meter/ ½ Meter Stick

String

Object: Rubber Stopper/Ball

Straw

Stopwatches

Apparatus:

Tape Force Probe to meter stick

Cut a 3 inch section of straw and tape it to the end of the meter stick

Attach object securely to string

Thread other end of string through straw and attach to force probe.

You should now be able to swing the object and register a force using Either Datamate or Easy Data.

Procedure:

1) One person should swing the stopper in a circle as consistently as possible.

The force probe needs to register a uniform reading.

2) Two people need to find the time it takes for the stopper to complete 10 revolutions.

Do this reading two times (for a total of 4 different readings)

3) Record data in the chart below.

Repeat this experiment three times for different lengths of string (from straw to stopper)

Sample Table

Mass of Object	Length of String (r)	Time of 10 revolutions	Period (T) (Time/10)	Calc (v) ($2\pi r/T$)	Calc (a_c) (v^2/r)	Calc F_c ($F_c=ma_c$)	Force Probe

Average _____

For Error analysis compare Calculated F_c to The Measured Force Probe Reading.