Name:_____ Date:_____ Class:_____

Uniform Circular Motion Activity

Goal: to analyze the forces needed for circular motion and understand what happens when those forces are removed.

Activity #1

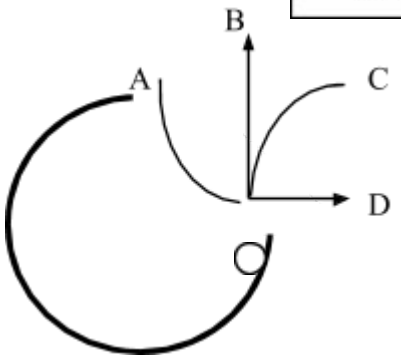
A marble on a plate can be made to go in a circle. If you give the marble a push while it is in the whole (uncut) plate, it will follow a circular path.

Force List
- Drag
- Friction
- Gravity
- Normal
- Tension
- Thrust

1. After your push, what is the force causing this circular motion?_____
   (hint: the surface of the marble is pushing on the surface of the plate)

2. In what direction is this force _____?
   (hint: think of the definition of this force)

A second plate has a section cut out of it. If you give the marble a push near the top so that it travels along the plate counter-clockwise, predict what path you think the marble take when it exits the plate?



3. Predicted path._____
4. Explain why you chose this path._____
   _____

_____

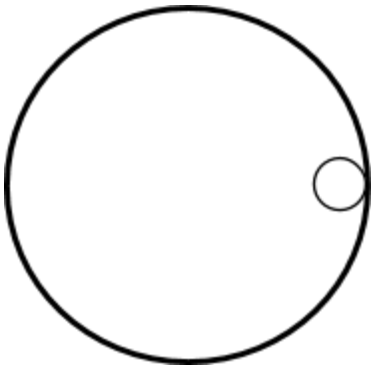
Test out your guess with the plate and marble. Do the experiment several times to make sure you know what actually happens.

5. What path does the marble take when it leaves the plate?_____

6. Does this agree with Newton's 1st law of motion? Why/why not?_____

_____

The picture on the right represents a marble going in a circle around a plate and the marble is moving counter clockwise.



7. What happens if you remove the force causing the marble to go in a circle?_____

_____

8. Draw the force vector acting on the marble.
9. Draw the velocity vector at that moment (
   Note: vectors are always arrows and are represented with a straight line. They show the objects velocity or force at that moment)

<u>Goggles must be worn AT ALL TIMES during this activity.</u>

Activity #2

Force List

- Drag
- Friction
- Gravity
- Normal
- Tension
- Thrust

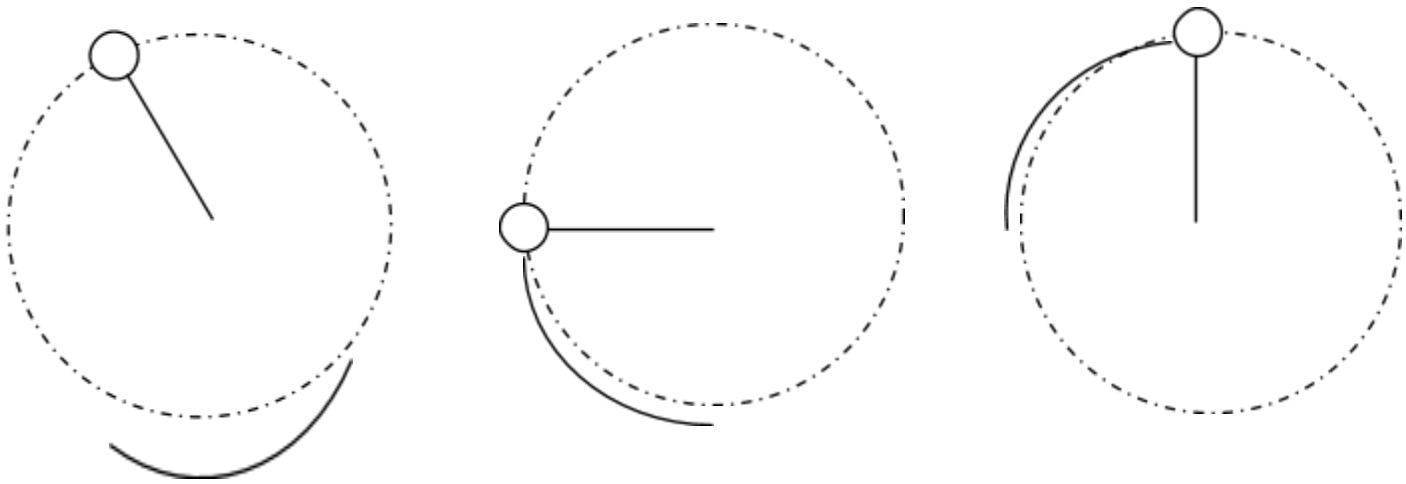
Spinning the stopper vertically and clockwise relative to the spinner

1. As you maintain circular motion, from the list to the right, what is the specific force directly causing the stopper to follow this path?_____
   (hint: though you are applying a force to the string, you are not connected to the stopper)

2. In what direction is this force?_____

Predict at what position you should let go of the string so that the stopper hits the ceiling?

A B C



3. Predicted release point_____

Test out your guess with the stopper. Do the experiment several times to make sure you know what actually happens. While still maintaining circular motion, you'll want to spin the stopper as slowly as possible so that your group can actually determine the proper release point.

4. What release point is required to strike the ceiling?_____

Summary

For an object going in a circle

5. In what direction is the force?_____

6. In what direction is the velocity?_____

7. For an object traveling in a circle, clockwise, draw the force and velocity vectors. Label them.