

Playing A-round with Circles

During this lab, there will be multiple stoppers on strings traveling in circles. Please be aware of your surroundings as you move around and as you twirl the stopper.

Circular Motion Terminology

1. Establish a horizontal circular path for the stopper. Note the **radius**, **period** and **angular velocity**.
 - a. Keep the **radius** the same, but increase the **period** of the motion.
 - i. Describe how you made this change.

 - ii. Describe the impact this had on the **angular velocity** of the stopper.

 - iii. Describe the impact the change had on the **linear speed** of the stopper.

 - b. Keep the **period** the same, but increase the **radius** of the motion.
 - i. Describe how you made this change.

 - ii. Describe the impact this had on the **angular velocity** of the stopper.

 - iii. Describe the impact the change had on the **linear speed** of the stopper.

2. Sketch a diagram of a stopper traveling in a circular path. Use the diagram to define each of the following terms.
 - a. Radius

 - b. Period

 - c. Angular velocity

 - d. Linear speed

Forces in Circular Motion

1. Establish a horizontal circular path with the stopper traveling at a moderate angular speed. Make a qualitative note of the tension of the string with your hand.
 - a. Increase the angular speed as you keep the radius constant. Describe the change in the tension in the string.

 - b. Return to the original angular speed. Decrease the radius of the circle. Describe the change in the tension in the string.

2. Trade stoppers with another group that has a different number and repeat the above radius and angular velocity. (#4 has less mass than #6) Describe the difference in the tension in the string.

3. Draw the free body diagram for the stopper.

4. Identify the three ways that an object can accelerate.

5. In the motion you created above, the stopper moved at a constant speed. Describe the acceleration of the stopper.