Centripital Force Worksheet

According to Isaac Newton, an object's "natural state of motion" is to stay at rest if it's already at rest or to continue in linear, uniform motion unless it's subjected to a net, external force. This means that if an object is moving at constant velocity (or speed) in a straight line, it will continue to move in a straight line, at that same velocity, unless some outside force changes its motion in some way.

So in order for an object to move in a circular path, some force is needed to pull it away from the straight-line trajectory it "wants" to follow (i.e., its natural state of motion). Some force needs to pull the rotating object in at every single point along its circular path in order for it continue moving in a circular fashion (instead of allowing it to follow its natural state of motion).

For example, imagine a mass attached to a string that's rotating on a table. The mass "wants" to continue in a straight line. But a force, transmitted via the string, pulls it in to the center at every point along its circular path. This force is called the centripetal force and is symbolized as Fc and is equal to the tension in the string. Mathematically, this force is equal to:

$$\text{Centripetal\_Force} = \frac{\text{mass x velocity}^2}{\text{Radius}}$$

where m is the mass of the rotating mass, v is the mass's linear velocity (or speed), and r is the radius of its circular orbit.
Assume **you are using a 50cm string** to create the circular orbit
Radius = 50 cm = .50 meters (assuming you use .50 meters)
Circumference = $2\pi r$ = 2(3.14) x (.50 m) = ________
Velocity = Circumference/ Time for one revolution (show one example)

Complete the table and graph Fc vs Velocity

Num of Washers & Mass	Time for 10 Revolutions (seconds)	Time for One Revolution (seconds)	Velocity (m/s)	Velocity^2 $(m/s)^2$	Fc (N)
0 , 0g	0	0	0	0	0
5 , 0.01kg	10				
10, 0.02kg	7.2				
15, 0.03kg	5.3				
20, 0.04kg	4.2				
