FLINN SCIENTIFIC

Name________________________________

Orbital Speed Worksheet

Part I — Orbital Speed and Radius

String Radius (meters)	Number of Revolutions in 20 Seconds	Period (Time for 1 Revolution)
1.0		
0.5		

Use the following equation to calculate orbital speed (velocity, v)

$$\text{Orbital speed} = \frac{2\pi r}{T}$$

v is the velocity (m/s)
r is the radius of the orbit (m)
T is the period—time for one revolution (s)

Orbital speed of stopper at:

1.0 meter ________ m/s

0.5 meter ________ m/s

Part II — Orbital Speed and Force of Gravity

Number of Washers	Number of Revolutions in 20 Seconds	Period (Time for 1 Revolution)
6		
18		

Use the orbital speed equation above to calculate the orbital speed of the stopper using:

6 washers ________ m/s

18 washers ________ m/s

Questions

1. Using the results from Part I, describe the relationship between orbital radius and orbital speed.

2. Using the results from Part II, describe the relationship between gravitational force and orbital speed.

3. Predict what would happen to the stopper if the string were suddenly cut during the demonstration.

4. How is this demonstration similar to the orbits of the planets? How is it different? What does the stopper represent? the tube handle?