Name: _____   Date: _____

Orbiting Water Balloons Worksheet

Today, you are a planet! You must determine the velocity required for a water balloon to escape the orbit around you.

Instructions

You will be given a 5 ft. length of twine with a clothes pin attached to the end and a small water-filled balloon. Each member of your group will take turns attaching a water balloon to the string and swinging it around.

The first student should start off very slow (swinging the balloon just fast enough to keep it off the ground). While swinging the balloon, another student should use a stop watch to count 10 second, and the other students should count how many times the balloon goes around in the 10 second intervals. Record the number of rotations in the "First Speed" column in the table below.

Then speed up the rotation slightly, and count the number of rotations again, this time putting the results in the "Second Speed" column. Keep increasing the speed and recording the results until the balloon releases from the clothes pin. Take the last recorded number of rotations and use the table at the bottom to calculate the escape velocity.

If time permits, repeat activity for each group member, and calculate the escape velocity for each person's swinging results.

	First Speed	Second Speed	Third Speed	Fourth Speed
Student	**# of Rotations**	**# of Rotations**	**# of Rotations**	**# of Rotations**

	# of Rotations Final Speed		**Time**		**Circumference**				**Escape Velocity**
					Diameter		**Pi**		
Escape Velocity 1		/	10 seconds	x	10 feet	x	3.14	=	
Escape Velocity 2		/	10 seconds	x	10 feet	x	3.14	=	
Escape Velocity 3		/	10 seconds	x	10 feet	x	3.14	=	
Escape Velocity 4		/	10 seconds	x	10 feet	x	3.14	=	
Escape Velocity 5		/	10 seconds	x	10 feet	x	3.14	=	