Trajectory of a Marble Lab

Name_____

You will need a marble, a ruler ramp, a cup, 3 meter sticks, and a stopwatch.

Part 1 - Determining the horizontal speed of the marble:

1. Set up a ramp on a table exactly 1 meter from the edge of the table, using two meter sticks as a guide. The marble should be able to roll down the ramp, across **exactly one meter** of table, and off the edge of the table presumably striking the floor some distance from the edge of the table. The ramp should be around 5 cm high on one end, so prop it up on a notebook or something not too high. (See my setup for reference)

2. Pick a unique distance **(each partner should choose their own unique distance)** up the ramp, and release it from rest 3 times from this position, timing the marble for the time it takes it to go 1.00 m

Times: _____   _____   _____   Average_____

Velocity: _____

Part 2 - Predicting where the marble will land on the floor:

Fill in the a H|V table below:

1. Measure the height of the table in meters. This is your vertical displacement (X). Be careful to make it negative. On the "V" side you also know the initial velocity and acceleration.
2. Make the Vi and Vf on the "H" side your velocity from part 1
3. Solve for the X on the "H" side of your table. Show your calculations on the sides.

H	V
$X =$ NOT from above	$X =$ -height of table
$V_i =$ from above	$V_i = 0$
$V_f =$ from above	$V_f =$
$a = 0$	$a = -9.8$
$t =$ NOT from above	$t =$ NOT from above

Part 3 - Testing your prediction:

Put the target cup at that distance from the edge of the table (IQ on the line!) , release from your unique position, and see if it goes in the cup. If this happens, you are obliged by long tradition to say "Eureka" loudly enough to be heard across the room.